



TIMSS 2023

International Results in Mathematics and Science



Matthias von Davier, Ann Kennedy,
Katherine A. Reynolds, Bethany Fishbein,
Lale Khorramdel, Charlotte E.A. Aldrich,
Allison Bookbinder, Ummugul Bezirhan, & Liqun Yin



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About TIMSS 2023

IEA's TIMSS 2023 is the eighth assessment cycle of TIMSS, the Trends in International Mathematics and Science Study. TIMSS 2023 was conducted at the fourth and eighth grades in 64 countries and 6 benchmarking systems.

Inaugurated in 1995, TIMSS has been conducted every four years since, providing 28 years of trends in mathematics and science achievement. TIMSS 2023 completes the transition to digital assessment, which began with TIMSS 2019, reflecting the widespread use of technology in schools and society.

Foreword

Since 1959, IEA has been pioneering global education research and monitoring achievement through its international assessments. With the release of the TIMSS (Trends in International Mathematics and Science Study) 2023 international results, one of IEA's flagship studies now provides twenty-eight years of trend data to support countries and education systems in making evidence-informed decisions. This is the largest pool of trend data from any international large-scale assessment in education. In this latest cycle, TIMSS's measurement of mathematics and science achievement, as well as contextual information in the fourth and eighth grades also completes the transition to assessing students in a digital environment. This not only reflects the growing use of technology and devices both in classrooms as well as other everyday tasks, but also is a fundamental aspect of IEA's commitment to driving innovation in the field of educational measurement and assessment to provide participating entities with the most comprehensive and robust data possible.

This shift to digital assessment allows students to engage with innovative, interactive tasks that simulate real-world and laboratory situations. The integration of PSIs (Problem Solving and Inquiry tasks) into the assessment design marks a leap forward in the ability to measure students' application of knowledge and skills. Furthermore, the new group adaptive design ensures a better alignment between the assessment and student populations across the achievement spectrum. Another development in TIMSS 2023 comprises enhanced international reporting, which now includes process data of how students have interacted with the assessment environment. These additional layers of information will provide unprecedented insights into students' problem-solving strategies, test-taking behaviors, and engagement levels while still maintaining the decades of trends that TIMSS fundamentally provides.

In addition to trends in mathematics and science achievement, TIMSS 2023 continues to offer a comprehensive view of education systems through its context data and the [TIMSS 2023 Encyclopedia](#). The quasi-longitudinal design, following the fourth-grade cohort to eighth grade, provides unique insights into educational progression, acting as

an early warning system for where certain reforms may be needed as well as a way to monitor these changes in four years' time for countries that continually participate in both grades. These comprehensive data sources combined allow the examination of various factors influencing student achievement, from classroom practices to national policies. This TIMSS cycle coincided with parallel data collection from another IEA study, ICILS (International Computer and Information Literacy Study) 2023, allowing for an even more holistic view of educational outcomes.

Another important new feature of TIMSS 2023 is the increased coverage of aspects of environmental education as they relate to the attitudes and behaviors of students. The construction of environmental awareness scales started with TIMSS 2019 and is now expanded to collect data highly relevant to education in the 21st century. Equipping students with knowledge and skills in environmental topics gives them the foundation to act responsibly and contribute to developing our world positively. Subsequent *TIMSS Insights* reports are planned relating to themes and questions central to TIMSS, starting with one in June 2025 on this very topic.

The global impact of TIMSS also continues to grow, with 72 education systems participating in this cycle. With its connection to UNESCO's Sustainable Development Goal 4, TIMSS plays a crucial role in monitoring progress towards quality education for all and acts as the indicator, alongside IEA's reading study PIRLS, for the numeracy and literacy "SDG minimum proficiency level" (indicator 4.1.1). The study's flexibility in accommodating benchmarking systems allows for more granular regional or grade-level analysis. In addition, an option to assess the same cohort one year later in the next grade via the TIMSS Longitudinal Study provides unique data on student growth for those who took the opportunity to participate. The results of this study will be available in 2025.

This international report was made possible by the hard work of many parties involved, and I would like to thank all the individuals who contributed to TIMSS 2023. IEA studies continue to be important high-quality data sources due to the work you all do. I extend my gratitude to the TIMSS & PIRLS International Study Center at Boston College's Lynch School of Education and Human Development for their commitment and leadership in this endeavor. I also recognize the valuable contributions of IEA staff, whose support has been instrumental in driving this research forward. My heartfelt thanks also go to our partner organizations—RTI International, ACER, and IPN—whose technical expertise and collaborative efforts have been crucial in ensuring the success of TIMSS 2023.

We all are especially grateful to the National Research Coordinators and research centers in each participating country. Their hard work, meticulous planning, and dedication to developing comprehensive frameworks in collaboration with many colleagues across our partner organizations have been vital to the integrity and depth of

the data collected. The financial support from the European Commission's Directorate-General for Education and Culture has been pivotal in enabling the participation of Western Balkan countries, enriching the diversity and scope of our findings.

Additionally, we acknowledge the immense contributions of all participating education systems, schools, teachers, students, and parents. Their participation and cooperation are the backbone of TIMSS, making it possible to gather meaningful data that reflects the educational landscapes worldwide.

Last but not least, we would like to thank Dr. Ina V. S. Mullis and Dr. Michael (Mick) Martin for their long-standing leadership and for ensuring a smooth and successful transition to the new leadership of the TIMSS & PIRLS International Study Center, which made this report possible.

Each cycle of TIMSS empowers countries with more data to make evidence-informed decisions, guiding policy and practice to enhance education systems. I encourage stakeholders to utilize this rich data repository to inform research and policies, drive innovation, and ultimately improve student learning experiences worldwide.

Dr. Dirk Hastedt
Executive Director, IEA

Overview of TIMSS 2023

IEA's TIMSS (Trends in International Mathematics and Science Study) is an ongoing international assessment program in mathematics and science. TIMSS 2023 marks a significant milestone in the evolution of international assessments, providing results based on 28 years of trends. It also completed the transition to a fully computer-based assessment. TIMSS 2023 assesses mathematics and science achievement in representative samples drawn from fourth- and eighth-grade student populations worldwide. It also provides valuable contextual data collected from students, parents, teachers, and school principals, in addition to data on national education systems and curricula.

The international comparative nature of TIMSS 2023 allows countries to benchmark their performance against other nations, fostering a global dialogue on best practices in mathematics and science education. By collecting data about students' achievement and various related contextual factors, TIMSS 2023 provides information that may support the development of more effective teaching and learning strategies, ultimately contributing to improved student outcomes and continuous improvement of education systems to prepare students for the challenges of the 21st century. Data from TIMSS 2023 can complement findings from in-depth national studies, thus facilitating evidence-based decisions about education policy and resource allocation.

The COVID-19 pandemic caused significant disruptions to education systems worldwide between the previous cycle, TIMSS 2019, and TIMSS 2023. TIMSS 2023 can

provide valuable information about the state of mathematics and science education before and after the pandemic, offering insights into how educational systems have responded to this unprecedented global disruption. However, as a cross-sectional observational study, TIMSS is not an experiment or a pre/post-test design and does not re-test students. Therefore, TIMSS is not designed to provide estimates of the causal effects of the pandemic on student learning outcomes. At the same time, the depth and breadth of the data available through TIMSS gives researchers ample opportunity to look at differences in results over cycles, including those before and after the pandemic.

TIMSS is directed by IEA's TIMSS & PIRLS International Study Center at Boston College in close cooperation with the IEA Amsterdam and IEA Hamburg offices. IEA is an independent international cooperative of national research institutions and government agencies that pioneered international assessments of student achievement in the 1960s to gain a deeper understanding of the relationship between policy and outcomes across countries' education systems. IEA's history of collecting comparative data on student achievement internationally is extensive, and international projects and study centers have supported IEA's goals to study mathematics and science achievement and contexts of achievement for more than 60 years.

TIMSS 2023 Participants and Students Assessed

TIMSS 2023 participants represent a diverse array of education systems around the world, including countries or distinct education systems within countries, as well as benchmarking participants representing specific regions or populations within countries. At the fourth grade, 59 countries and 6 benchmarking entities participated in TIMSS 2023,¹ while at the eighth grade, 44 countries and 3 benchmarking entities participated. At the fourth grade, 12,016 schools were selected and within schools, 359,098 students were assessed. At the eighth grade, 8,786 schools were selected, and within schools, 297,262 students were assessed in the TIMSS 2023 cycle. Contextual data was collected using questionnaires administered to participating students, their school principals and teachers, as well as to the parents of participating fourth-grade students.

¹ Iraq and the Benchmarking Participant Kurdistan Region of Iraq administered the fourth-grade TIMSS 2023 assessment, but their results did not meet international reporting standards.



* Completed paper-based assessment comprised of TIMSS 2019 trend items in at least one grade

Countries participating in TIMSS 2023 administered the assessment at different times of the year based on their school calendars. Northern Hemisphere countries typically had testing windows from March to June of 2023 and Southern Hemisphere countries typically had testing windows from August to November of 2023.

While TIMSS assesses students in their fourth and eighth years of formal schooling, IEA has a policy that the average age of the students in the grade selected does not fall below 9.5 years old (Grade 4) or 13.5 years old (Grade 8) at the time of testing.² More

² Norway assessed students in the fifth and ninth year of schooling so students would be compared to students of similar age in Denmark, Finland, and Sweden. South Africa assessed students in their fifth and ninth years of schooling to better match curricula and maintain trend measurement. Türkiye also chose to assess students in the fifth grade.

details about the students assessed in each education system can be found in Appendix B.³

TIMSS 2023 Assessment Frameworks

The TIMSS 2023 mathematics and science assessments are based on frameworks developed collaboratively with participating countries and content area experts. The [TIMSS 2023 Mathematics Framework](#) and [TIMSS 2023 Science Framework](#) each describe achievement in relation to subject-specific content and cross-cutting cognitive domains. The content domains covered by the assessments are presented in the table below. All TIMSS assessments address three cognitive domains: knowing, applying, and reasoning.

The specification of the content and cognitive domains has remained stable across TIMSS cycles, and TIMSS 2023 continues to report on these domains separately as subscales, as well as on the main TIMSS mathematics and science trend scales.

Computer-Based Assessment

The transition to computer-based testing, which began with TIMSS 2019, was completed by almost all participating countries and benchmarking participants in TIMSS 2023. The few remaining paper-based countries are linked to the TIMSS 2023 results by means of the portion of trend assessment materials that were retained from TIMSS 2019 and earlier in the 2023 materials.

Assessing students on computers enables the use of more innovative and engaging assessment methods that better reflect how students learn in schools and how students increasingly interact with technology in their daily lives. By leveraging digital tools and platforms, the TIMSS 2023 assessments are able to incorporate a wider range of item types, including interactive features, multimodal materials, and opportunities for test-taker exploration and experimentation, creating a more immersive and dynamic testing experience. Technology-based testing also allows for a more secure test administration, more reliable and comparable scoring, and more efficient data saving, transmission, and analysis, providing educators and policymakers with more reliable and comparable data for actionable insights into the performance of student populations. Moreover, the computer-based format enables advanced analytics using modern methodologies such as machine learning, including process data mining, to identify patterns and trends in student responses, providing a more nuanced understanding of their strengths, weaknesses, and learning needs.

³ Appendix B provides information about important characteristics of countries' samples, including population coverage and exclusion rates, school and student sample sizes, and sample participation rates.

TIMSS 2023 features a diverse range of item types. In addition to traditional discrete items that assess a range of mathematical and scientific concepts, the assessment includes extended Problem-Solving and Inquiry (PSI) tasks composed of multiple interrelated items. These innovative PSI tasks, first introduced in TIMSS 2019, are designed to simulate real-world scenarios, presenting students with complex challenges that require them to think critically, creatively, and analytically. By mimicking authentic problem-solving experiences, including simulations of outcomes for students to observe, PSI tasks encourage students to engage in scientific inquiry, model mathematical relationships, and develop solutions to practical problems. For instance, a PSI task might ask students to design an experiment to test the effect of pH on plant growth or to optimize the shape of a container to maximize its volume while minimizing its surface area. By working through these interactive tasks, students demonstrate their ability to apply mathematical and scientific concepts to real-world contexts, think logically, and communicate their reasoning effectively. Including PSI items in TIMSS 2023 provides a more comprehensive picture of student learning outcomes, moving beyond mere content knowledge to assess the skills and competencies required for success in an increasingly complex and interconnected world.

Group-Adaptive Design

TIMSS 2023 implements targeted testing to match student populations and assessment difficulty through a country-level adaptation of booklet rotations to improve efficiency and optimize student engagement. The traditional TIMSS booklet rotation design was [improved for TIMSS 2023](#) to allow for different rates of less and more difficult booklets within countries. The assessment items were divided into carefully crafted blocks and assembled into booklets to reflect a certain difficulty target. The administration of these booklets is rotated among students within each country. In most countries, more difficult and less difficult booklets were rotated equally. However, in some countries where it was anticipated students might struggle to answer many difficult items, less difficult booklets were administered at higher rates. In some known high-performing countries, the rate of more difficult booklets was increased. The booklet rotation approach enables the assessment to cover the entire range of content and skills while reducing the number of items each student is required to complete, and the differential rotation of more or less difficult booklets improved the match between item difficulty and the distribution of student proficiencies within countries. As a result, students were presented with a more manageable testing experience, which helped to minimize test fatigue and frustration and maximized their engagement, motivation, and effort. The country-level adaptive design also allowed for a more reliable estimation of student achievement at the country level. By optimizing the testing experience this way, TIMSS 2023 balances assessment efficiency and comprehensiveness, providing educators and policymakers with a more accurate understanding of student learning outcomes.

Environmental Awareness

Building on the success of the environmental awareness achievement scale introduced in [TIMSS 2019](#), TIMSS 2023 continues to expand its scope to assess environmental knowledge and attitudes. This component of TIMSS 2023 provides valuable insights into students' understanding of environmental issues, including climate change, biodiversity, and conservation. By examining students' knowledge of these topics, TIMSS 2023 sheds light on their ability to recognize the interconnectedness of human and natural systems and their capacity to think critically about the impact of human activities on the environment. In TIMSS 2023, information about students' environmental knowledge is complemented by collecting data on their attitudes toward the natural environment and engagement in environmentally responsible behaviors. By assessing both knowledge and attitudes, TIMSS 2023 provides a more comprehensive understanding of students' environmental literacy, which is essential for empowering them to make informed decisions about sustainability and become active participants in addressing global environmental challenges. These data can inform education policy and practice, helping to identify areas where educational systems can better support the development of environmental awareness.

Quality Assurance

TIMSS 2023 made every effort to ensure the quality and comparability of data by carefully planning and documenting standardized operational procedures, implementing an international quality control monitoring program, and conducting rigorous data verification and validation processes. The assessments were administered to nationally representative and well-documented probability samples of students in each country. The TIMSS sampling team from RTI International and IEA Hamburg worked with National Research Coordinators on all phases of sampling activities to ensure compliance with sampling and participation requirements and documented any deviations from the standards.

IEA Amsterdam worked with the TIMSS & PIRLS International Study Center to manage an extensive series of verification checks to ensure the comparability of translations of the assessment items and questionnaires and to conduct an international quality assurance program of school visits to monitor and report on the administration of the assessment. IEA Hamburg worked closely with National Research Coordinators during the project to organize data collection operations and to check all data for accuracy and consistency within and across countries.

Finally, full documentation of the many technical activities required to conduct TIMSS 2023 is provided in the [TIMSS 2023 Technical Report](#). This volume includes detailed information about the processes used to develop and implement the TIMSS 2023 assessments, including sampling, translation verification, data collection, scaling, linking, and data analysis.

About this Report

TIMSS 2023 International Results in Mathematics and Science is presented in a web-based format that provides users with an engaging and interactive experience. The report is organized around exhibits focusing on science and mathematics achievement, followed by exhibits that combine contextual data with achievement data. Finally, several appendices complete the presentation of the results by helping readers understand and further explore information specific to TIMSS 2023. Report exhibits are displayed as interactive tables (some including graphical elements), allowing users to explore and analyze the data from different perspectives. The report text and exhibits are presented in an integrated way, with various navigation support features, such as filters, sorting options, and hover-over descriptions. These features facilitate individualized investigations of the findings. Exhibit data is also available for download in various formats.

The innovative format of this report supports readers' engagement with the rich information available through TIMSS 2023, making it easier for educators, policymakers, and researchers to access, understand, and use the findings to inform education policy and practice. By providing a dynamic and user-friendly reporting platform, TIMSS 2023 aims to promote a deeper understanding of student learning outcomes in mathematics and science, ultimately contributing to improved educational outcomes worldwide.

There are several considerations to keep in mind when interpreting the data in the exhibits included in this report. TIMSS 2023 was conducted in many countries, and effects of system-level differences on the data collection can be reduced but not fully eliminated. While the vast majority of countries have high-quality, reliable, valid, and comparable data, there are differences in response rates, reliability of achievement estimates, and the extent to which the standards established for ensuring comparable assessment results were followed. Following best practices, this report provides estimates of statistical variability in the form of standard errors and confidence intervals where possible. It provides footnotes to contextualize sampling, response rate, and other limitations where needed.

Starting February 2025, the TIMSS 2023 International Database can be downloaded in commonly used formats (R, SPSS, and SAS). Users can analyze the data according to their research questions and explore findings beyond the ones presented in this report. TIMSS 2023 results can also be further contextualized using the [TIMSS 2023 Encyclopedia](#), which provides system-level information about education policy and practices in the participating TIMSS countries.

Mathematics Achievement

Grade 4 Mathematics Achievement Distributions

Average Mathematics Achievement and Scale Score Distributions (Grade 4)

The TIMSS 2023 fourth-grade mathematics assessment was delivered fully digitally and was based on a comprehensive [assessment framework](#) developed collaboratively with the participating countries to reflect their curricular goals. The fourth-grade mathematics assessment included three content areas—number, together with introductory algebraic concepts (50%); measurement and geometry (30%); and data (20%). The framework prescribed that the mathematics items assessed fourth-grade students in the three cognitive domains knowing, applying, and reasoning. To cover the framework at the fourth grade, the assessment comprised 187 items distributed across 14 item blocks with an average of 13 items per block.

The 2023 cycle marked the full transition to a computer-based assessment system, incorporating an [adaptive booklet rotation](#) to balance the proportion of more and less difficult booklets for countries with very high or very low expected average achievement. The 2023 assessment was carefully designed using a balanced incomplete block design, adhering to industry standards, and analyzed with state-of-the-art psychometric models. Consequently, the TIMSS 2023 mathematics achievement results for all 58 countries and 5 benchmarking participants are reported on the same TIMSS fourth-grade mathematics scale. The TIMSS fourth-grade mathematics achievement scale was established in TIMSS 1995, based on the combined distribution of achievement data across all participating countries, treating each country equally. A centerpoint of 500 was set to correspond to the mean of overall achievement in 1995, with 100 points set to correspond to the standard deviation. Students' achievement is placed on the scale with each subsequent TIMSS cycle, most recently for TIMSS 2023.

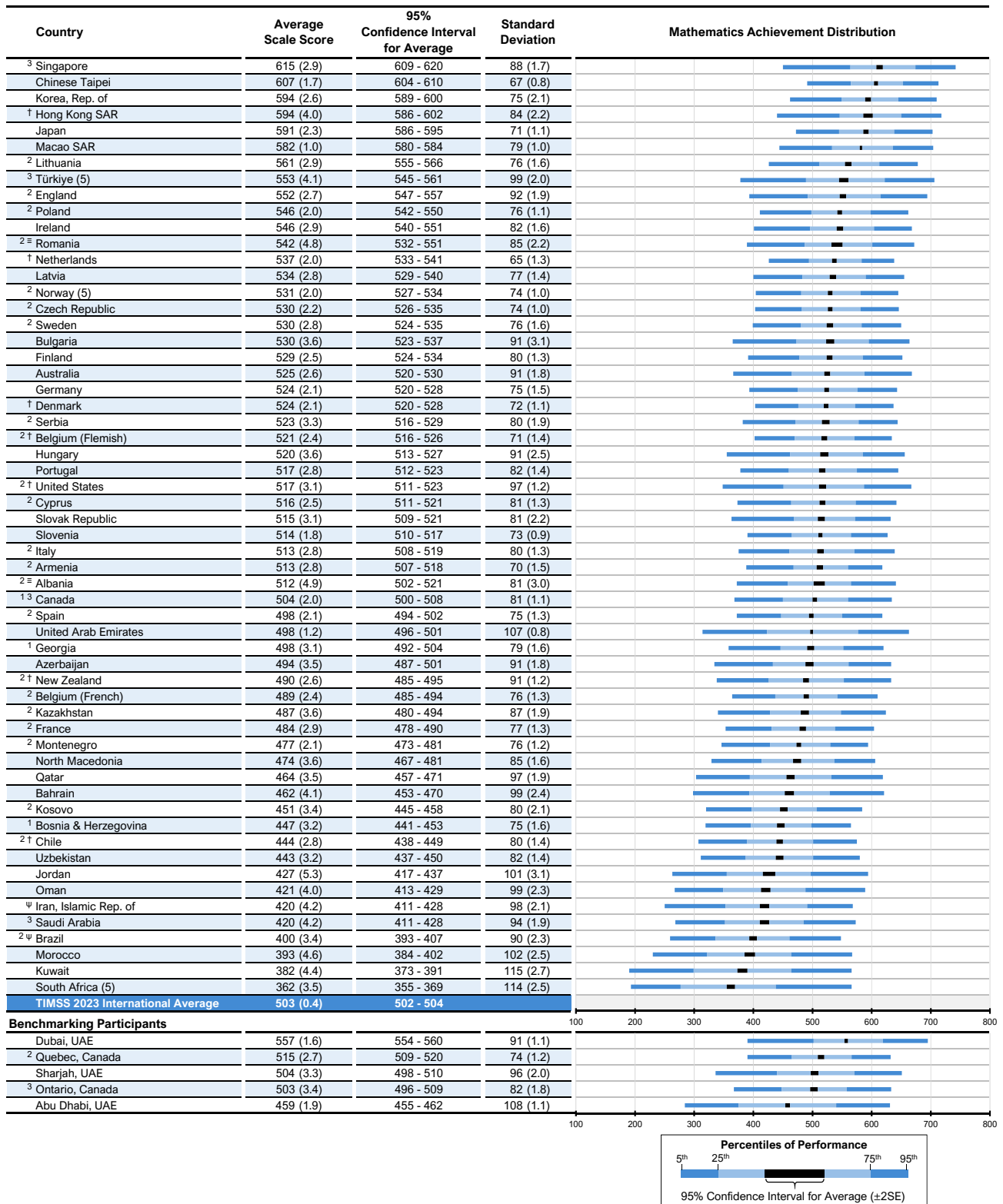
Exhibit 1.1.1 reports the average mathematics achievement estimates at the fourth grade for each of the 58 TIMSS 2023 participating countries and the 5 benchmarking entities. The exhibit also presents the corresponding confidence intervals, and standard deviations for each country, together with the associated standard errors for these estimates (given in parentheses). Additionally, it includes a visualization of the score distribution, illustrating percentiles of the distribution and the confidence interval of the average achievement. The exhibit includes an international average estimate of the mean and confidence interval based on the 58 countries that participated in TIMSS 2023, with each country contributing equally. The standard error of this estimate reflects the variance of this international average based on these countries.

The exhibit is interactive and can be sorted by different criteria, with average achievement used as the default. Sorted by average achievement, the exhibit shows that the countries with the highest estimated average achievement are Singapore, Chinese Taipei, Korea, Hong Kong SAR, and Japan. That is, among the highest-ranking countries are participating countries from East Asia – as in previous TIMSS cycles. For example, the estimated average achievement in Korea is 594 and the 95% confidence interval ranges from 589 to 600. The confidence interval provides a score range around the estimated mean that illustrates the uncertainty in this estimate, which is based on a sample of students in a selection or subset of classrooms within a sample of schools in each country. Intervals constructed in this way around the estimated average have a 95% chance to include the true average of the country’s achievement.

Notably, there is considerable variability in achievement not only across participants, but also within each country, as indicated by the standard deviation, the interquartile range, and the difference between the 10th and 90th percentiles of the achievement distribution shown in the table. Therefore, it would be incorrect to assume that (all) students in any country achieve higher scores than students in another country. While the average achievement of one country may be considerably higher than the average achievement in another country, each country has some lower-achieving students and some higher-achieving students.

While examining the average achievement across countries can provide an initial summative impression of achievement in participating countries, the data collected by TIMSS 2023 and reported here is much more comprehensive. TIMSS also provides results about the range of achievement observed in each country, and in later sections about associations with contextual factors, which provide a deeper understanding of student performance relative to student background.

Exhibit 1.1.1: Average Mathematics Achievement and Scale Score Distributions



The TIMSS achievement scale was established in 1995 based on the combined achievement distribution of all countries that participated in TIMSS 1995. To provide a point of reference for country comparisons, the scale centerpoint of 500 was located at the mean of the combined achievement distribution. The units of the scale were chosen so that 100 scale score points corresponded to the standard deviation of the combined achievement distribution.

() Standard errors appear in parentheses. Because of rounding some results may appear inconsistent.

See Appendix B.2 for population coverage notes 1, 2, and 3. See Appendix B.5 for sampling guidelines and sampling participation notes †, ‡, and =.

ψ Reservations about reliability because the percentage of students with achievement too low for estimation exceeds 15% but does not exceed 25%.

Average Mathematics Achievement for Girls and Boys (Grade 4)

Exhibit 1.1.2 shows the differences in average mathematics achievement between fourth-grade girls and boys in the 58 countries and 5 benchmarking participants, along with the average achievement for each of these groups, together with their associated standard errors (given in parentheses). Countries are sorted by default according to the size of the achievement difference between boys and girls, where negative differences indicate girls' average achievement is higher than boys, and positive differences indicate boys had a higher average than girls. In TIMSS 2023, a range of differences can be observed across countries. In most countries (40), boys showed higher average achievement than girls, with only one country exhibiting an advantage for girls. The remaining 17 countries did not have average achievement differences statistically different from 0. It can be observed that differences of about 10 points or more tend to be flagged as statistically significant with an alpha level of 0.05. In contrast, smaller differences tend not to be flagged as significantly different from 0, unless their standard error (given in parentheses) is unusually small. Statistical significance does not necessarily imply that a difference is practically meaningful and achievement differences between girls and boys should always be considered in broader educational contexts within countries.

Exhibit 1.1.2: Average Mathematics Achievement for Girls and Boys

Country	Girls		Boys		Difference	Difference	
	Percent of Students	Average Scale Score	Percent of Students	Average Scale Score		Girls Scored Higher	Boys Scored Higher
South Africa (5)	50 (0.7)	376 (3.7)	50 (0.7)	348 (4.3)	-29 (3.9)		
^ψ Iran, Islamic Rep. of	49 (1.6)	425 (5.1)	51 (1.6)	414 (6.1)	-10 (7.6)		
Jordan	52 (2.6)	431 (8.4)	48 (2.6)	422 (5.8)	-9 (9.9)		
Bahrain	48 (1.1)	466 (5.5)	52 (1.1)	458 (5.1)	-8 (6.5)		
Azerbaijan	46 (0.8)	496 (4.1)	54 (0.8)	493 (3.6)	-3 (3.3)		
North Macedonia	50 (0.7)	474 (3.7)	50 (0.7)	474 (4.1)	0 (3.1)		
Oman	50 (0.6)	421 (3.9)	50 (0.6)	422 (4.4)	1 (2.3)		
² Armenia	49 (1.0)	512 (3.3)	51 (1.0)	513 (3.0)	1 (2.9)		
Morocco	48 (0.9)	392 (4.9)	52 (0.9)	394 (5.2)	2 (4.1)		
³ Saudi Arabia	49 (1.0)	418 (6.0)	51 (1.0)	421 (5.2)	3 (7.5)		
² Albania	48 (1.8)	510 (5.2)	52 (1.8)	513 (5.4)	3 (3.7)		
¹ Bosnia & Herzegovina	50 (1.1)	445 (3.4)	50 (1.1)	449 (3.8)	3 (3.1)		
Bulgaria	47 (0.8)	528 (3.8)	53 (0.8)	532 (4.2)	3 (3.5)		
¹ Georgia	50 (0.8)	495 (3.5)	50 (0.8)	500 (3.7)	5 (3.8)		
Uzbekistan	49 (0.9)	441 (3.6)	51 (0.9)	446 (3.5)	6 (3.2)		
Finland	49 (0.9)	526 (2.8)	51 (0.9)	532 (2.9)	6 (2.7)		
² Romania	49 (1.0)	539 (5.2)	51 (1.0)	545 (5.3)	6 (4.2)		
Ireland	49 (1.3)	542 (3.8)	51 (1.3)	549 (3.4)	6 (4.0)		
Chinese Taipei	48 (0.5)	603 (2.0)	52 (0.5)	611 (2.2)	7 (2.3)		
Kuwait	51 (2.1)	378 (6.1)	49 (2.1)	386 (6.4)	8 (8.9)		
Latvia	49 (1.2)	530 (3.6)	51 (1.2)	538 (3.0)	8 (3.6)		
Slovenia	49 (0.8)	509 (2.2)	51 (0.8)	519 (2.2)	10 (2.5)		
Japan	51 (0.5)	586 (2.5)	49 (0.5)	596 (2.7)	10 (2.5)		
² Kosovo	48 (0.9)	446 (3.4)	52 (0.9)	457 (4.3)	11 (3.5)		
² Poland	50 (0.9)	541 (2.4)	50 (0.9)	551 (2.7)	11 (3.2)		
² Serbia	51 (0.9)	518 (3.5)	49 (0.9)	528 (4.0)	11 (3.7)		
² Montenegro	48 (0.8)	471 (2.7)	52 (0.8)	483 (2.1)	12 (2.4)		
³ Singapore	49 (0.5)	609 (3.1)	51 (0.5)	621 (3.1)	12 (2.4)		
² Lithuania	49 (0.8)	554 (3.2)	51 (0.8)	567 (3.2)	13 (2.5)		
² Brazil	50 (0.6)	394 (3.5)	50 (0.6)	406 (4.0)	13 (2.9)		
² Kazakhstan	49 (0.6)	480 (3.9)	51 (0.6)	494 (3.8)	13 (2.6)		
Germany	49 (0.7)	517 (2.5)	51 (0.7)	530 (2.5)	13 (2.6)		
United Arab Emirates	49 (0.7)	491 (1.8)	51 (0.7)	505 (1.5)	14 (2.2)		
¹ Hong Kong SAR	49 (1.2)	587 (4.3)	51 (1.2)	601 (4.4)	14 (3.3)		
³ Türkiye (5)	48 (1.2)	546 (4.5)	52 (1.2)	560 (5.0)	14 (4.7)		
² Norway (5)	50 (0.8)	523 (2.4)	50 (0.8)	538 (2.4)	15 (2.7)		
² Czech Republic	49 (0.7)	523 (2.2)	51 (0.7)	538 (2.8)	15 (2.6)		
¹ Denmark	51 (0.8)	516 (2.4)	49 (0.8)	532 (2.6)	15 (2.6)		
² Sweden	51 (0.8)	522 (3.0)	49 (0.8)	538 (3.3)	16 (2.8)		
² Chile	47 (1.1)	435 (3.0)	53 (1.1)	452 (3.3)	17 (2.9)		
Slovak Republic	50 (0.9)	506 (3.8)	50 (0.9)	523 (3.1)	17 (3.2)		
Korea, Rep. of	50 (0.5)	586 (3.1)	50 (0.5)	603 (2.9)	17 (2.9)		
¹ Netherlands	50 (0.8)	528 (2.5)	50 (0.8)	546 (2.4)	17 (2.8)		
² Spain	49 (0.6)	489 (2.1)	51 (0.6)	507 (2.6)	18 (2.1)		
² United States	49 (0.5)	508 (3.0)	51 (0.5)	526 (3.5)	18 (2.1)		
Hungary	50 (0.9)	511 (3.3)	50 (0.9)	529 (4.3)	18 (2.8)		
² England	50 (0.9)	543 (3.5)	50 (0.9)	561 (3.1)	18 (3.5)		
² Belgium (Flemish)	49 (0.7)	511 (3.2)	51 (0.7)	530 (2.8)	18 (3.5)		
Macao SAR	48 (0.7)	572 (1.4)	52 (0.7)	592 (1.6)	20 (2.1)		
^{1,3} Canada	51 (0.6)	494 (2.1)	49 (0.6)	514 (2.5)	20 (2.2)		
² Cyprus	49 (0.8)	506 (2.6)	51 (0.8)	526 (3.3)	21 (3.2)		
² Belgium (French)	50 (0.9)	479 (2.7)	50 (0.9)	500 (2.8)	21 (2.4)		
² New Zealand	49 (0.9)	479 (3.0)	51 (0.9)	501 (3.3)	21 (3.3)		
Qatar	49 (1.2)	453 (4.2)	51 (1.2)	474 (4.4)	21 (4.9)		
Portugal	50 (0.7)	506 (3.1)	50 (0.7)	528 (3.3)	22 (3.0)		
² Italy	48 (0.8)	501 (2.9)	52 (0.8)	524 (3.2)	22 (2.6)		
Australia	52 (1.0)	514 (2.9)	48 (1.0)	537 (3.1)	23 (3.3)		
² France	50 (0.8)	473 (3.2)	50 (0.8)	496 (3.2)	23 (2.9)		
International Average	49 (0.1)	498 (0.5)	51 (0.1)	508 (0.5)	11 (0.5)		
Benchmarking Participants							
Abu Dhabi, UAE	50 (0.4)	453 (2.0)	50 (0.4)	464 (2.5)	11 (2.3)		
Sharjah, UAE	48 (0.7)	498 (4.3)	52 (0.7)	509 (2.8)	11 (3.1)		
Dubai, UAE	48 (2.2)	548 (2.7)	52 (2.2)	565 (1.8)	17 (3.2)		
² Quebec, Canada	50 (0.8)	505 (3.0)	50 (0.8)	525 (3.1)	20 (2.7)		
³ Ontario, Canada	52 (1.0)	493 (3.4)	48 (1.0)	514 (4.4)	21 (3.7)		

Students' gender information was obtained from school tracking data.

() Standard errors appear in parentheses. Because of rounding some results may appear inconsistent.

See Appendix B.2 for population coverage notes 1, 2, and 3. See Appendix B.5 for sampling guidelines and sampling participation notes †, ‡, and ≡.

^ψ Reservations about reliability because the percentage of students with achievement too low for estimation exceeds 15% but does not exceed 25%.

80 40 0 40 80

■ Difference statistically significant ($p < 0.05$)

■ Difference not statistically significant

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Grade 4 International Benchmarks of Mathematics Achievement

International Benchmarks of Grade 4 Mathematics Achievement

To understand what students at different points on the TIMSS achievement scale know and can do, it is important to examine the types of tasks students at certain defined points on the TIMSS achievement scale are likely to solve. For example, in terms of students' mathematics skills, if a group of students has an average achievement of 550, what do these students know and what can they do, compared to students with an average achievement of 400? Looking at the proportion of students who can solve the TIMSS mathematics items can help countries determine whether students at different levels along the scale have gained the mathematics knowledge and skills covered in the mathematics curriculum.

To provide more information about the range of achievement students show in the TIMSS fourth-grade mathematics assessment, TIMSS reports percentages of students reaching four increasingly challenging points along the achievement scale, known as International Benchmarks: Low International Benchmark (400 scale score points), Intermediate International Benchmark (475), High International Benchmark (550), and Advanced International Benchmark (625). The TIMSS International Benchmarks build on each other, representing increasingly demanding mathematics knowledge and skills with each higher benchmark. The students who reach a higher benchmark have also surpassed all lower benchmarks. For example, students who reached the Advanced Benchmark also surpassed the High, Intermediate, and Low Benchmarks.

Descriptions for each International Benchmark provide an interpretation of the achievement scale in relation to students' performance on the assessment items. For TIMSS 2023, the descriptions of mathematics achievement at the International Benchmarks were updated from TIMSS 2019 based on a review and analysis of the items that students with average achievement at or above each of the benchmarks were likely to solve in TIMSS 2023 (see Chapter 14 in the TIMSS 2023 Technical Report).

Exhibit 1.1.3: Summary of TIMSS 2023 International Benchmarks of Mathematics Achievement

	Advanced International Benchmark
625	<i>Students can select and relate information to implement appropriate operations to solve problems.</i> They can interpret the results of computations given in problem contexts, formulate a variety of expressions and patterns, and relate fractions and decimals. They can estimate and relate measures, apply knowledge of two- and three-dimensional shapes, identify simple properties of lines and angles, and show a basic understanding of surface area and perimeter in simple shapes. Students can interpret data and make choices about data given in numerous contexts.
	High International Benchmark
550	<i>Students relate concepts or representations in extended contexts.</i> They can apply knowledge of properties of whole numbers to justify a solution. They show an understanding of the number line, multiples, factors, rounding numbers, and operations with fractions and decimals. Students can resolve measurement tasks across numerous contexts. They can relate two-dimensional shapes to unfamiliar three-dimensional figures and demonstrate basic understanding of angles. Students can interpret features of data representations and represent data in a variety of graphs.
	Intermediate International Benchmark
475	<i>Students demonstrate mathematical knowledge in simple situations and relate representations.</i> They can perform computations with three-digit whole numbers in a variety of situations. They can add and order simple decimals. Students can measure straight distances and describe three-dimensional shapes. They can use data from multiple sources to relate representations.
	Low International Benchmark
400	<i>Students demonstrate basic mathematical understanding.</i> They can add and subtract whole numbers with up to three digits, multiply and divide single-digit whole numbers, and solve simple word problems. They can apply basic measurement ideas and properties of common geometric shapes. Students can read data from different representations and complete simple bar graphs.

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Exhibit 1.1.5: Description of the TIMSS 2023 Low International Benchmark (400) of Mathematics Achievement

	Low International Benchmark
400	Summary <i>Students demonstrate basic mathematical understanding.</i> They can add and subtract whole numbers with up to three digits, multiply and divide single-digit whole numbers, and solve simple word problems. They can apply basic measurement ideas and properties of common geometric shapes. Students can read data from different representations and complete simple bar graphs. Students recognize place value and can order six-digit numbers. They can add and subtract to complete simple number sentences or word problems. Students demonstrate basic understanding of multiplication with one-digit numbers by identifying missing values in number sentences or the next number in a counting sequence. Students show some knowledge of measurement units and simple two-dimensional geometric shapes including symmetric shapes. Students can read data from tables, bar graphs, and pictographs and complete the bars and labels of simple bar graphs.

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Exhibit 1.1.6: Description of the TIMSS 2023 Intermediate International Benchmark (475) of Mathematics Achievement

Intermediate International Benchmark
475
Summary

Students demonstrate mathematical knowledge in simple situations and relate representations. They can perform computations with three-digit whole numbers in a variety of situations. They can add and order simple decimals. Students can measure straight distances and describe three-dimensional shapes. They can use data from multiple sources to relate representations.

Students can perform basic arithmetic with whole numbers up to 3 digits, including multiplication of 3-digit by 1-digit whole numbers, and division with a remainder. They can apply a simple multistep rule, solve word problems involving single-digit multiplication and comparison, and round whole numbers. Students can identify missing numbers or operations in number sentences with whole numbers and up to two operations. Students can represent a situation given in words as an expression or number sentence. Students can add and order numbers with one decimal place.

Students can measure lengths with an on-screen ruler. They can compare units of measure and relate metric prefixes to select appropriate measurements of mass and volume. They can relate three-dimensional shapes to their two-dimensional representations, including when given in an interactive model.

Students can read and interpret information in tally charts and line graphs. They can integrate multiple data sources to complete a two-way table. Students can relate data in a table to the corresponding pie chart representation. They can combine data with additional information to solve word problems.

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Exhibit 1.1.6a: TIMSS 2023 Intermediate International Benchmark (475) of Mathematics Achievement – Example Item 1**Content Domain:** Number**Cognitive Domain:** Applying**Description:** Identifies the missing number in two number sentences with inequalities

Make the number sentences true.

Drag one number card to each box.

3	5	7	8

5 + is greater than 12.

20 – is greater than 15.

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Exhibit 1.1.6b: TIMSS 2023 Intermediate International Benchmark (475) of Mathematics Achievement – Example Item 2
Content Domain: Data

Cognitive Domain: Applying

Description: Determines one or two out of three missing values in a table given conditions for the data (1 of 2 points)

Students in a class made three different origami animals using blue, red, and yellow paper. The table shows the number of animals that were made with each color paper.

Animal	Color Paper		
	Blue	Red	Yellow
 Tortoise	8	4	3
 Giraffe	3	2	10
 Fish	10	6	

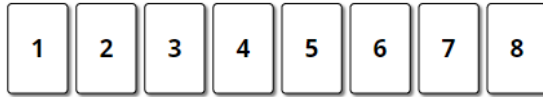
Complete the table by solving this puzzle:

- There are the same number of blue fish as yellow giraffes.
- There are the same number of red fish as the other two red animals combined.
- There are 24 yellow animals in all.

The answer shown illustrates one type of response that would receive partial credit (1 of 2 points)

Content Domain: Number**Cognitive Domain:** Reasoning**Description:** Solves a problem set in a novel situation involving addition and comparison of whole numbers and justifies the solution

Mark and Keith are playing a game that uses these 8 cards.



They put the cards facedown so the numbers do not show. Then each player picks 2 cards. The player with the larger sum is the winner.

Mark picks the 8 card and the 2 card. The sum is 10.

Keith first picks the 4 card.

Can Keith win the game?

(Click one box.)



Yes



No

Explain your answer.

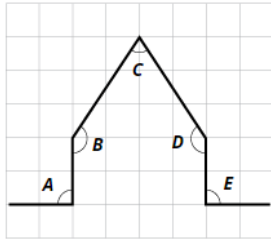
he could pick 7 or 8

The answer shown illustrates one type of response that would receive full credit.
Other types of correct responses are possible as defined by the item's unique scoring guide.

Content Domain: Measurement and Geometry

Cognitive Domain: Knowing

Description: Classifies angle types in a figure



Identify the type of each angle in the diagram. Record your answers in the table.

Angle A is already done for you.

	Right angle	Smaller than a right angle	Larger than a right angle
A	☒	☐	☐
B	☐	☐	☒
C	☐	☒	☐
D	☐	☐	☒
E	☒	☐	☐

Exhibit 1.1.8: Description of the TIMSS 2023 Advanced International Benchmark (625) of Mathematics Achievement



Advanced International Benchmark

625

Summary

Students can select and relate information to implement appropriate operations to solve problems. They can interpret the results of computations given in problem contexts, formulate a variety of expressions and patterns, and relate fractions and decimals. They can estimate and relate measures, apply knowledge of two- and three-dimensional shapes, identify simple properties of lines and angles, and show a basic understanding of surface area and perimeter in simple shapes. Students can interpret data and make choices about data given in numerous contexts.

Students can integrate several number properties to solve multistep word problems involving whole numbers. They can interpret division results, including those with a remainder, to give the appropriate answer based on the problem context. Students can solve simple equations involving an unknown and formulate expressions and number sentences. They can apply a multiplication rule to find a number in a sequence. They can use an interactive table of values to determine and describe rules involving addition, multiplication, or multiples. Students can represent a simple fraction as a portion of a whole and make multiple comparisons, including comparing one-place decimals with two-place decimals.

Students can estimate quantities between graded intervals, including with a ruler. They can relate measures and constraints to solve multistep problems, such as interpreting a balanced scale to determine an unknown weight and relating duration with time. They can determine the area of a triangle or square using unit squares, draw a rectangle on a grid given its perimeter, and find missing lengths. Students can draw parallel or perpendicular lines on a grid and identify the properties of an angle in a closed shape. They can identify properties of simple polygons, draw a polygon to meet given requirements, and relate triangles to the composition of an irregular shape. Students can identify the number and shape of faces comprising a non-rectangular three-dimensional shape.

Students can represent data on a line graph and determine the best display for a given dataset. They can interpret data to determine what questions can be answered from data in a table, complete a table from listed observations, and solve multistep problems.

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Exhibit 1.1.8a: TIMSS 2023 Advanced International Benchmark (625) of Mathematics Achievement –
Example Item 1

Content Domain: Measurement and Geometry

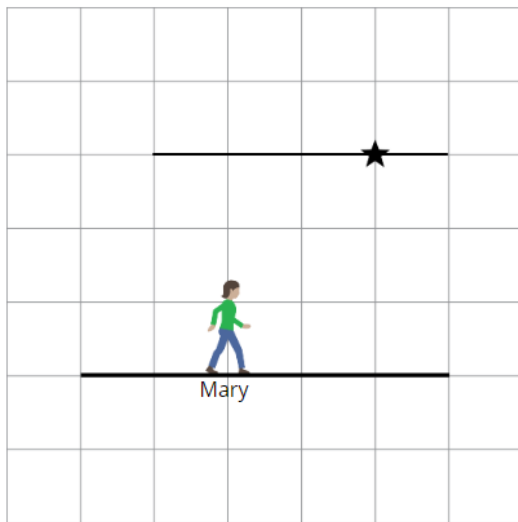
Cognitive Domain: Applying

Description: Draws a line on a square grid that is parallel to a given line and passes through a specified point

Mary is walking along a path in the park.

There is another path in the park that is **parallel** to Mary's path and goes through the ★ .

Draw the other path.



The answer shown illustrates one type of response that would receive full credit.
Other types of correct responses are possible as defined by the item's unique scoring guide.

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Exhibit 1.1.8b: TIMSS 2023 Advanced International Benchmark (625) of Mathematics Achievement –
Example Item 2

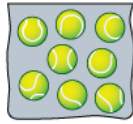
Content Domain: Number

Cognitive Domain: Applying

Description: Identifies an expression with division and addition that represents a situation

A sports coach needs to put 40 tennis balls and 10 soccer balls into bags.

Each bag can hold **either** 8 tennis balls **or** 2 soccer balls.



or



How can the sports coach calculate the total number of bags he will need?

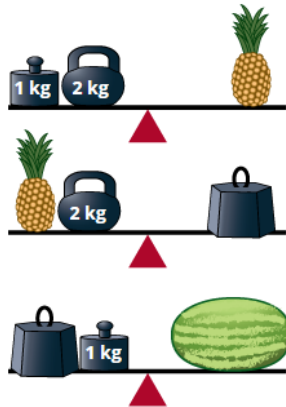
- ☐ A $40 + (10 \div 2)$
- ☐ B $(40 \div 2) + (10 \div 8)$
- ☐ C $(40 + 8) \div (10 + 2)$
- ☒ D $(40 \div 8) + (10 \div 2)$

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Exhibit 1.1.8c: TIMSS 2023 Advanced International Benchmark (625) of Mathematics Achievement – Example Item 3**Content Domain:** Measurement and Geometry**Cognitive Domain:** Reasoning**Description:** Determines the weight of an object given a series of three balanced scales

On each scale the objects on the left weigh the same as the objects on the right.



How much does the  weigh?

- ☐ A 3 kg
- ☐ B 4 kg
- ☐ C 5 kg
- ☒ D 6 kg

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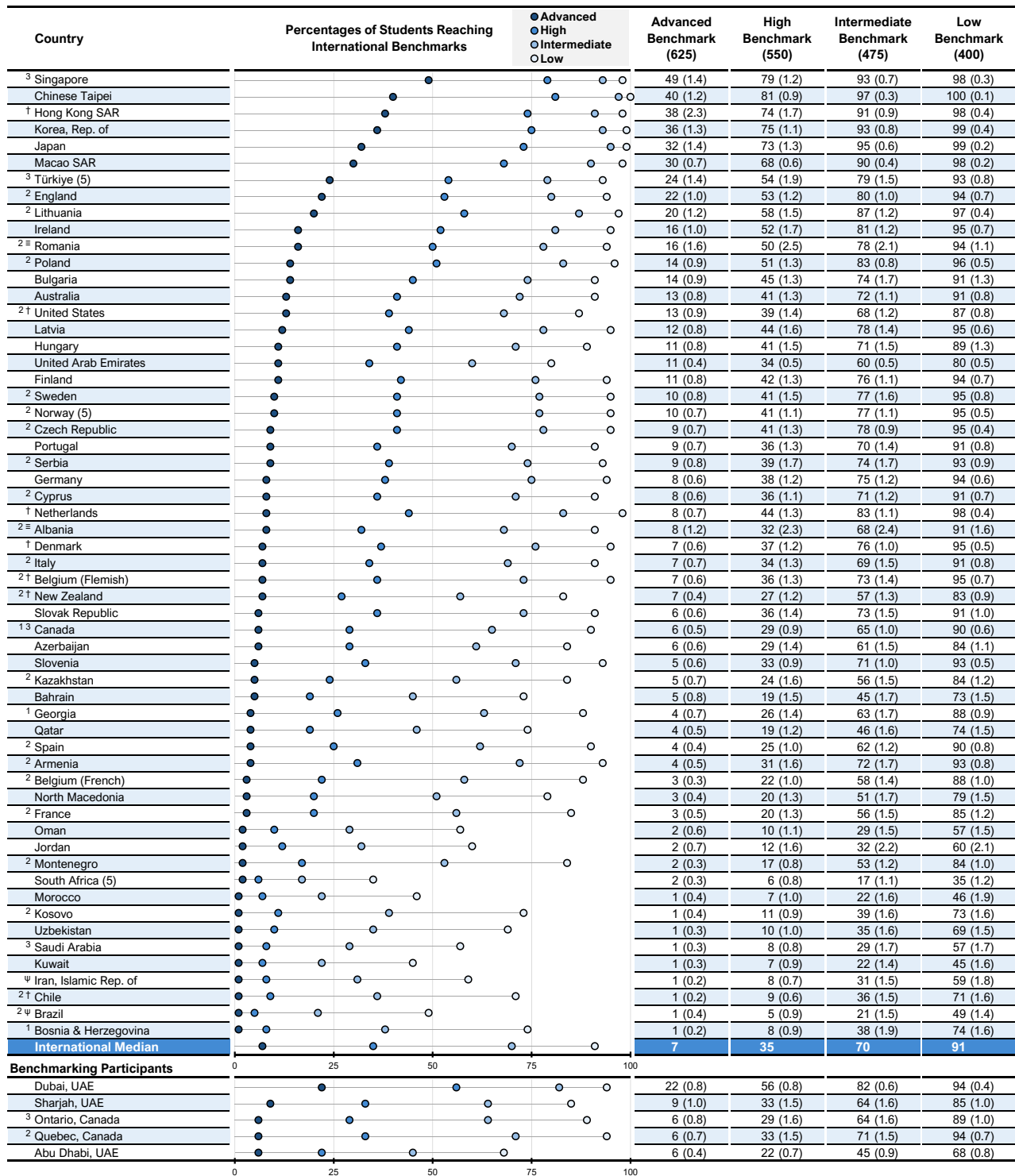
Percentages of Students Reaching International Benchmarks of Mathematics Achievement (Grade 4)

Exhibit 1.1.4 provides graphical and numerical representations of the percentages of fourth-grade students reaching each TIMSS 2023 International Benchmark in participating countries and benchmarking entities. The International Benchmarks function like steps on a ladder: If students reached a higher benchmark, they also reached each of the lower benchmarks. The percentages do not add up to 100%, but rather indicate cumulative proportions: The lower the benchmark, the higher the proportion of students reaching that benchmark. Conversely, the higher the benchmark, the lower the proportion of students reaching it. The exhibit also provides the standard error (in parentheses) associated with each of the estimated percentages.

As a point of reference, the exhibit reports the international median of the percentage of students reaching each International Benchmark across participating countries, instead of an average as is displayed in other report exhibits for average achievement. By definition, half of the countries will have a percentage in the column above the median and half will be below the median.

Across the 58 countries, the median percentages of fourth-grade students reaching each International Benchmark in TIMSS 2023 were 7 percent at Advanced, 35 percent at High, 70 percent at Intermediate, and 91 percent at Low. The percentage reaching the Advanced Benchmark ranged from 49 percent to 1 percent. The percentage of students reaching the Low Benchmark ranged from over 99 percent to 35 percent. In many TIMSS 2023 countries (31), more than 90 percent of fourth-grade students internationally reached the Low Benchmark, which can be considered a level of minimum proficiency. The exhibit allows sorting by percentage of students reaching each International Benchmark and selecting groups of countries, facilitating the examination of relative differences in the percentages of students reaching the different levels of proficiency described by the TIMSS 2023 International Benchmarks.

Exhibit 1.1.4: Percentages of Students Reaching the TIMSS International Benchmarks of Mathematics Achievement



() Standard errors appear in parentheses. Because of rounding some results may appear inconsistent.

See Appendix B.2 for population coverage notes 1, 2, and 3. See Appendix B.5 for sampling guidelines and sampling participation notes †, ‡, and =.

ψ Reservations about reliability because the percentage of students with achievement too low for estimation exceeds 15% but does not exceed 25%.

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Grade 4 Trends in Mathematics Achievement

Trends in Mathematics Achievement (Grade 4)

The fourth-grade TIMSS mathematics achievement scale was established in TIMSS 1995, based on the achievement across all participating countries. In 1995, the international mean was set to 500, and the international standard deviation was set to 100, providing the origin of the TIMSS trend scale. Students' achievement was placed on the same scale with each subsequent TIMSS cycle, most recently for TIMSS 2023. Reporting the achievement data from each TIMSS assessment on the TIMSS trend scale enables monitoring increases or decreases in achievement across assessment cycles.

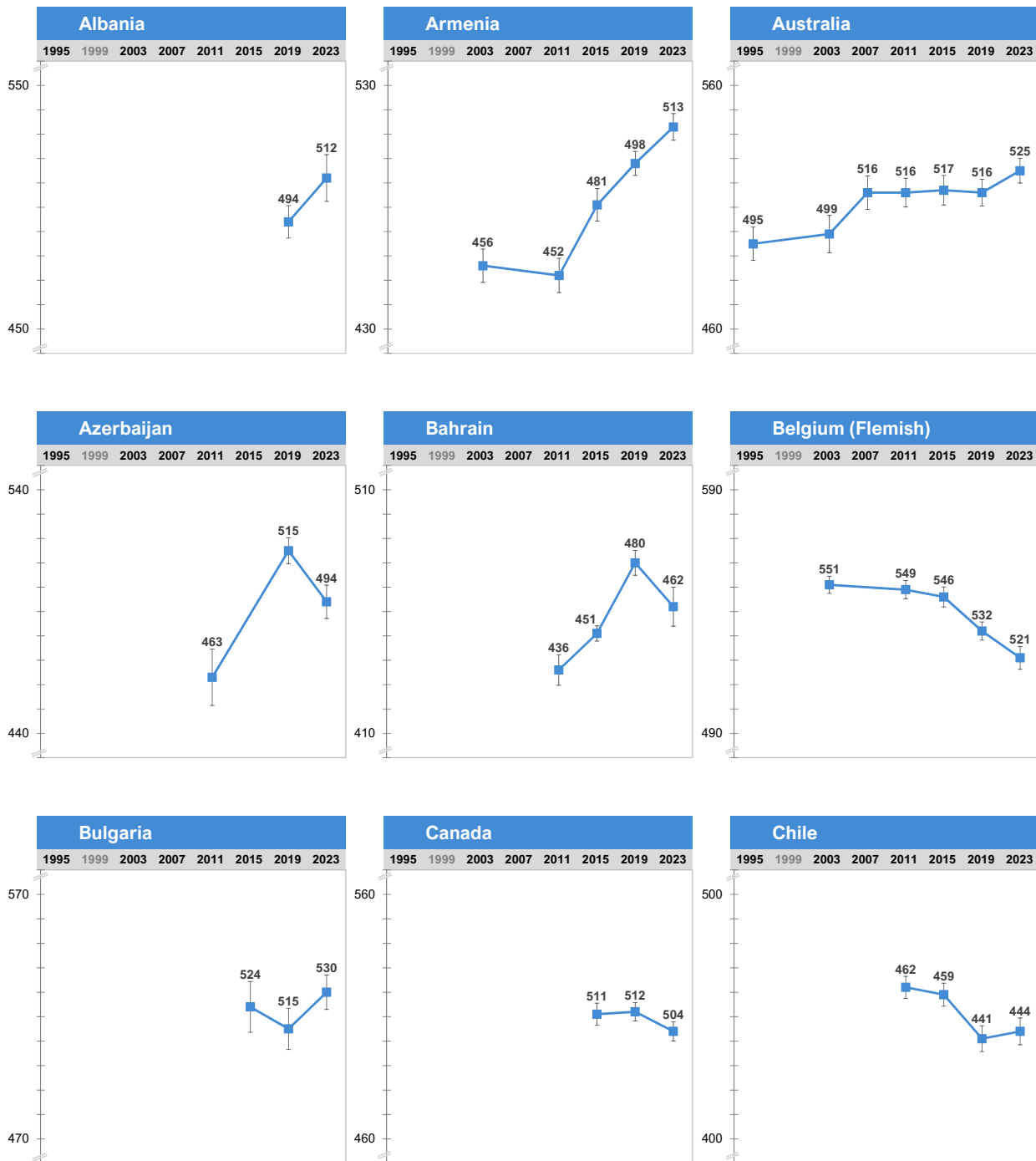
Exhibit 1.1.9 displays changes in achievement across assessment years for the countries and benchmarking participants that have participated in prior cycles of TIMSS. The trend graphs include a graphical representation of the 95% confidence interval around each cycle mean, depicted as small error bars above and below the average achievement estimate. Confidence intervals of this type have a 95% probability to include the true country average under repeated sampling. Users can select individual countries, groups of countries, or all countries that participated for customized displays of trends.

Across the TIMSS cycles spanning the years from 1995 to 2023, most countries that participated multiple times have had some periods of increases or decreases in average achievement as well as periods of stability. It can be seen that even if estimates of average achievement may be lower or higher for adjacent years, the confidence intervals overlap quite frequently. In cases of larger differences with little or no overlap of confidence intervals, the trends over time indicate more visible changes of larger magnitude.

Exhibit 1.1.10 extends the results of Exhibit 1.1.9, providing more detail about the achievement distributions across assessment cycles and the differences in average achievement between each previous TIMSS cycle and TIMSS 2023. Symbols are used to indicate if an estimate obtained in a prior TIMSS cycle shows a statistically significant difference compared to TIMSS 2023. The direction of the up or down arrow shows whether the previous estimate is higher or lower than the estimate obtained in 2023. For the 49 countries with comparable data in TIMSS 2019, 14 showed an increase in average mathematics achievement in TIMSS 2023, 13 showed a decrease, and 22 had no change. Confidence intervals for the average achievement of each cycle are reported, corresponding to the error bars in the trend graphs in Exhibit 1.1.9. The graphical depiction of the percentiles provides a visualization of the distribution and shows the range of achievement that is observed in each cycle. The overlap of these visual representations of achievement distributions provides a reference for the magnitude of changes observed across TIMSS cycles.

Exhibit 1.1.9: Trend Plots of Average Mathematics Achievement[◇]

This exhibit displays changes in achievement across assessment years for the countries and benchmarking participants that have comparable data from previous TIMSS assessments. The accompanying table (Exhibit 1.1.10) provides details. The scale interval is 10 points for each country, but a different part of the scale is shown according to each country's average achievement. See Appendix A for country participation in previous assessments.



◇ There was no TIMSS fourth grade assessment in 1999. See Appendix A for country participation in previous TIMSS assessments.
 The scale interval is 10 points for each country, but a different part of the scale is shown according to each country's average achievement.
 I The black bars represent the 95% confidence interval.

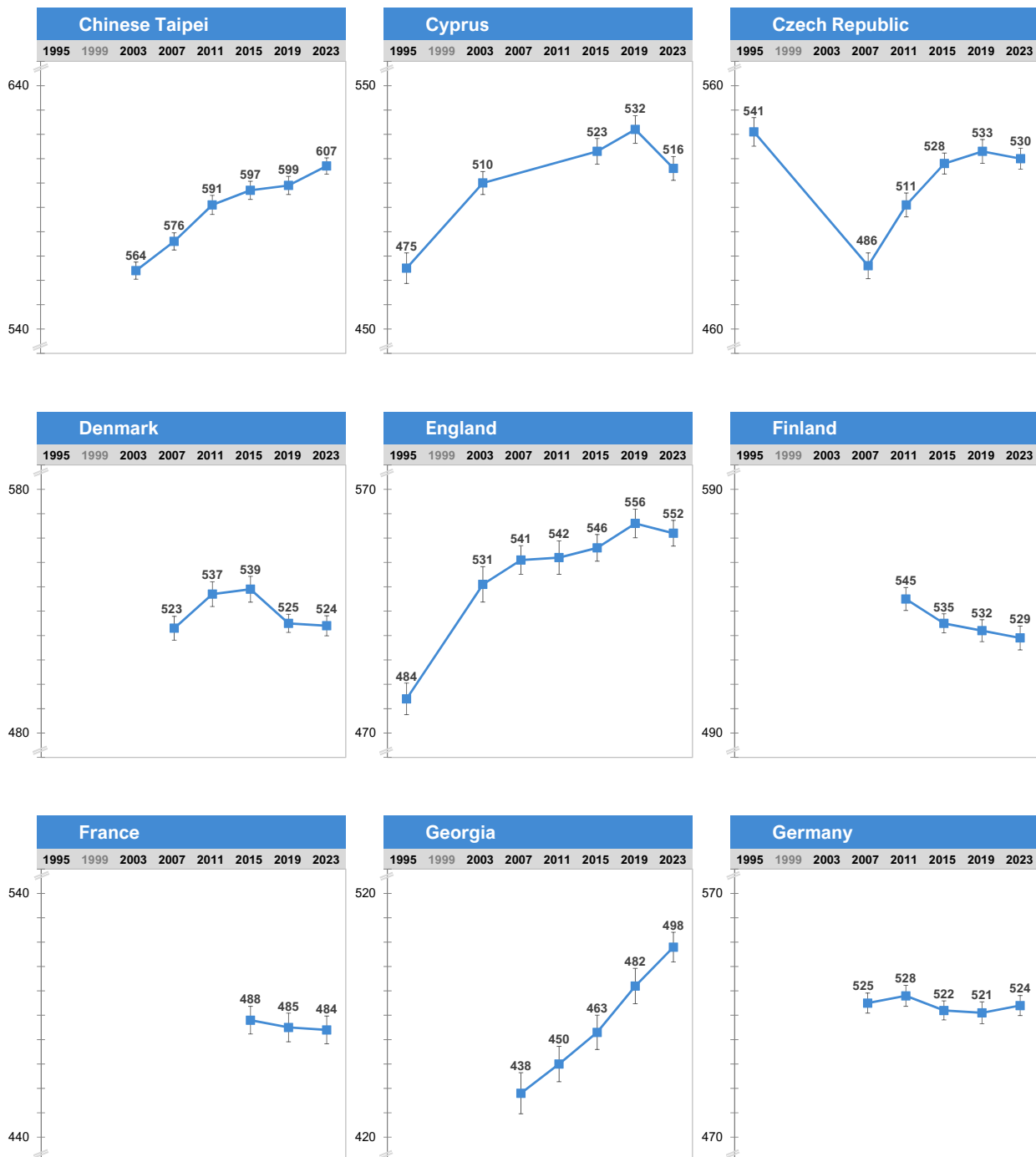
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Exhibit 1.1.9: Trend Plots of Average Mathematics Achievement[◇]

(Continued)

This exhibit displays changes in achievement across assessment years for the countries and benchmarking participants that have comparable data from previous TIMSS assessments. The accompanying table (Exhibit 1.1.10) provides details. The scale interval is 10 points for each country, but a different part of the scale is shown according to each country's average achievement. See Appendix A for country participation in previous assessments.



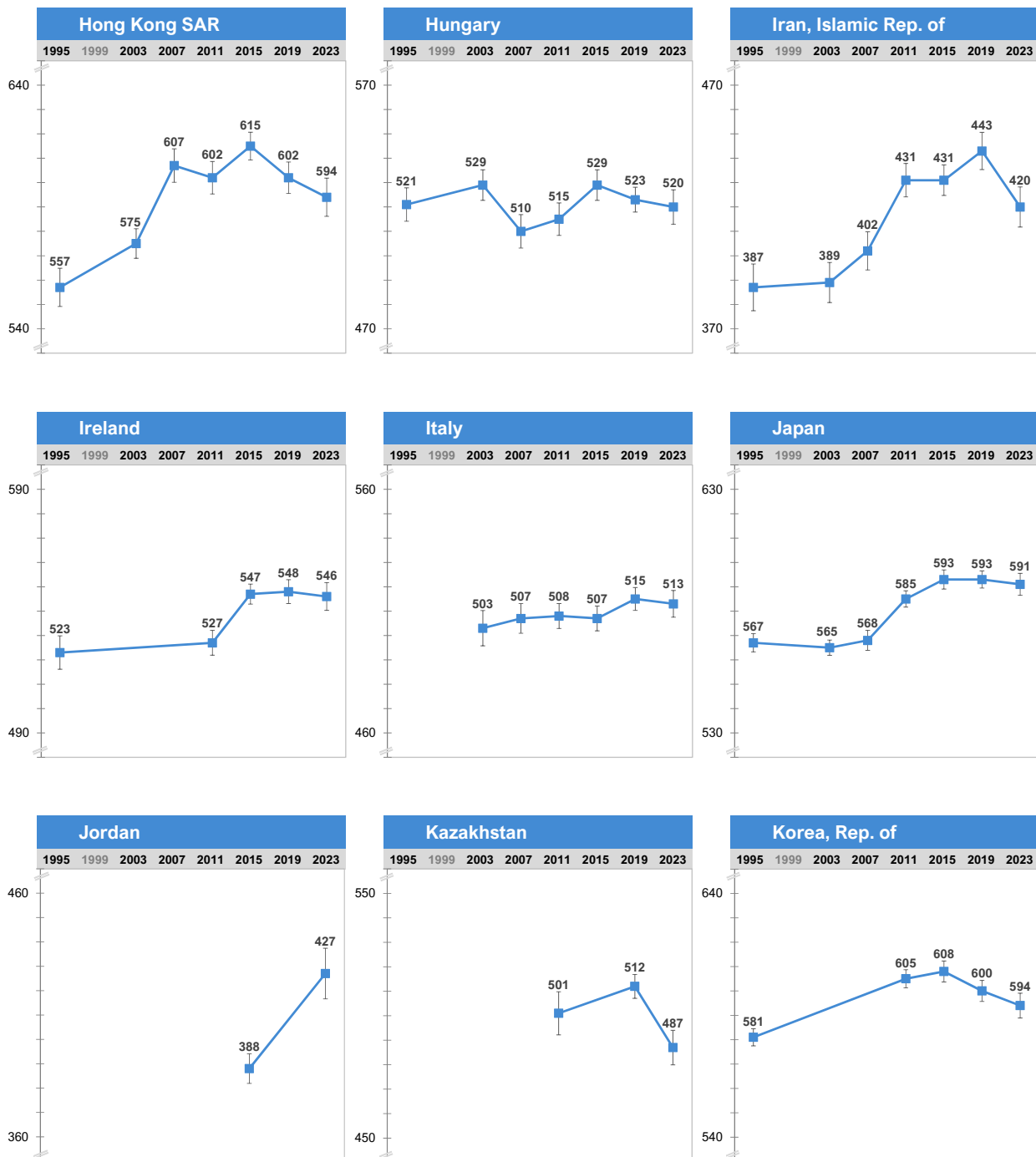
◇ There was no TIMSS fourth grade assessment in 1999. See Appendix A for country participation in previous TIMSS assessments.
 The scale interval is 10 points for each country, but a different part of the scale is shown according to each country's average achievement.
 I The black bars represent the 95% confidence interval.

SOURCE: IEA's Trends in International Mathematics and Science Study - TIMSS 2023
 Downloaded from <https://timss2023.org/results>

Exhibit 1.1.9: Trend Plots of Average Mathematics Achievement[◇]

(Continued)

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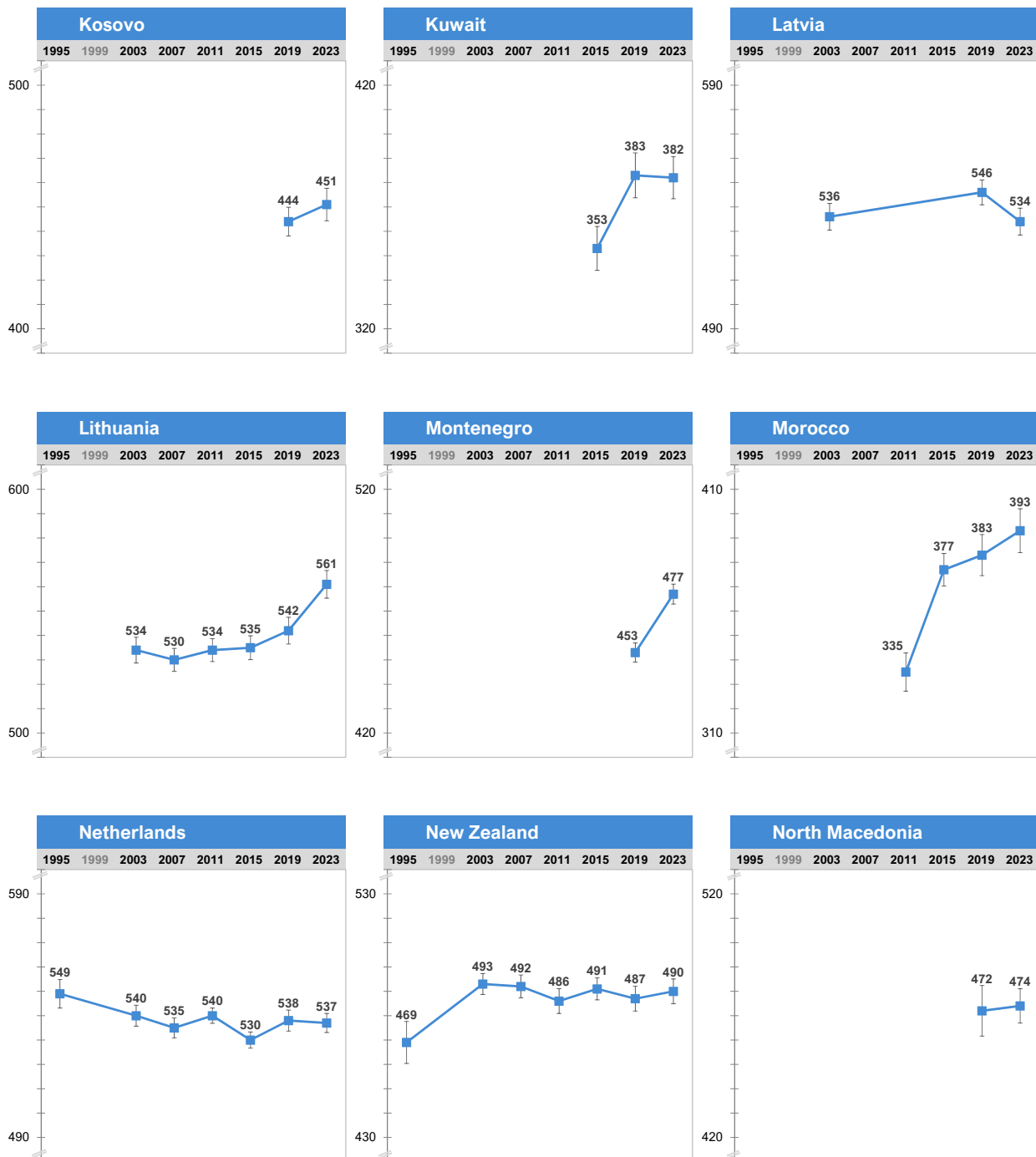
◇ There was no TIMSS fourth grade assessment in 1999. See Appendix A for country participation in previous TIMSS assessments.
The scale interval is 10 points for each country, but a different part of the scale is shown according to each country's average achievement.
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Exhibit 1.1.9: Trend Plots of Average Mathematics Achievement[◇]

(Continued)

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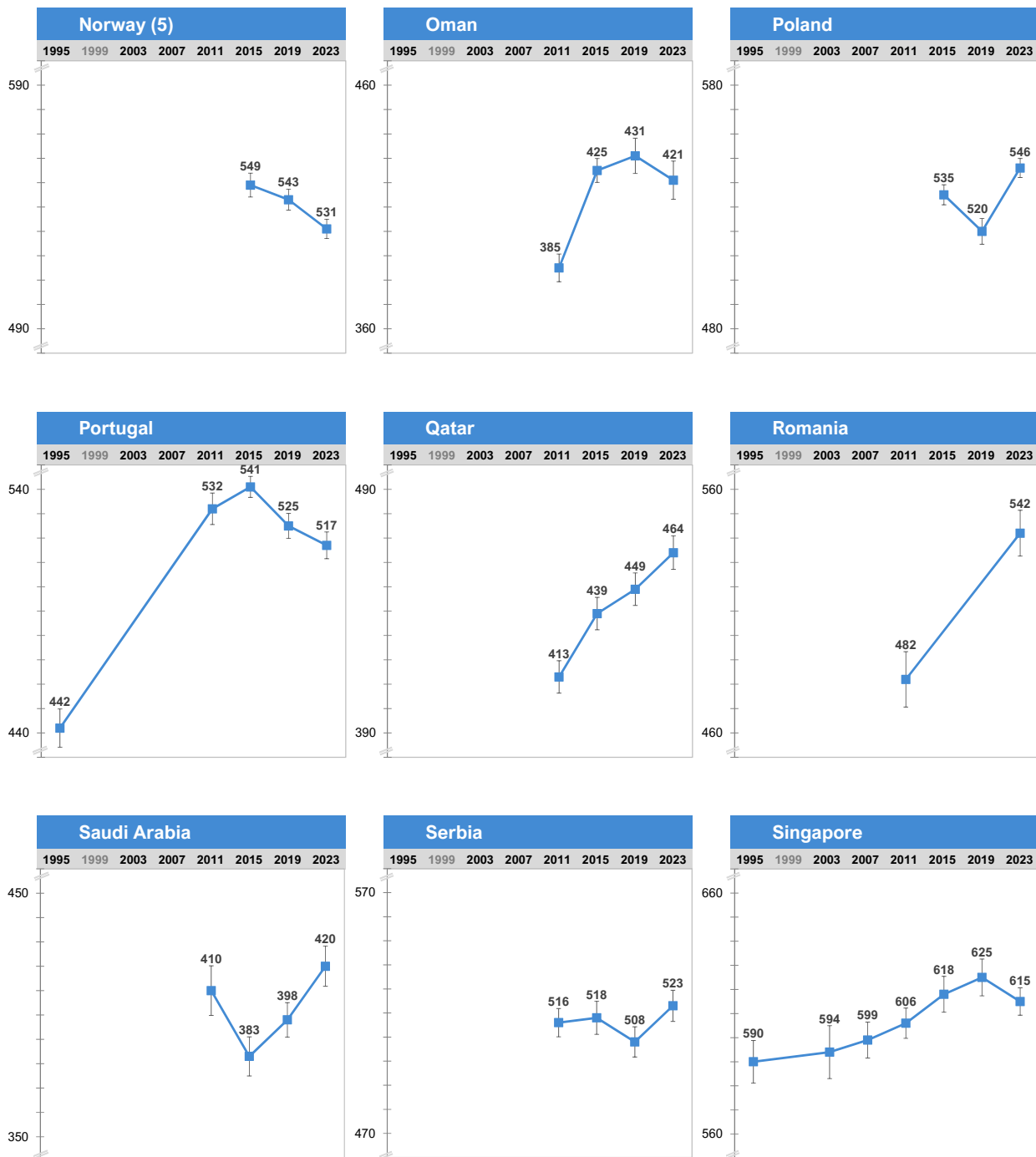
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Exhibit 1.1.9: Trend Plots of Average Mathematics Achievement[◇]

(Continued)

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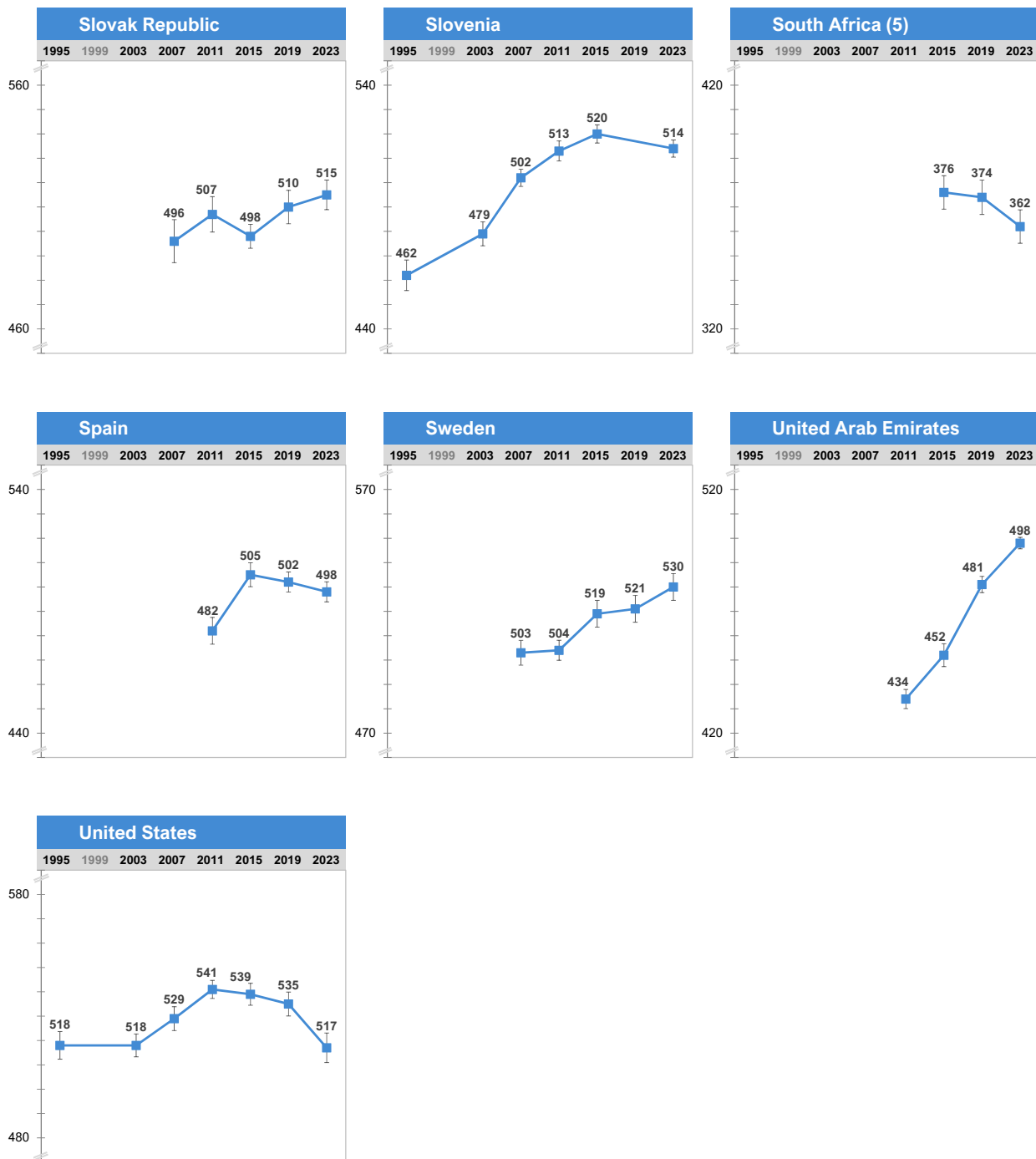
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Exhibit 1.1.9: Trend Plots of Average Mathematics Achievement[◇]

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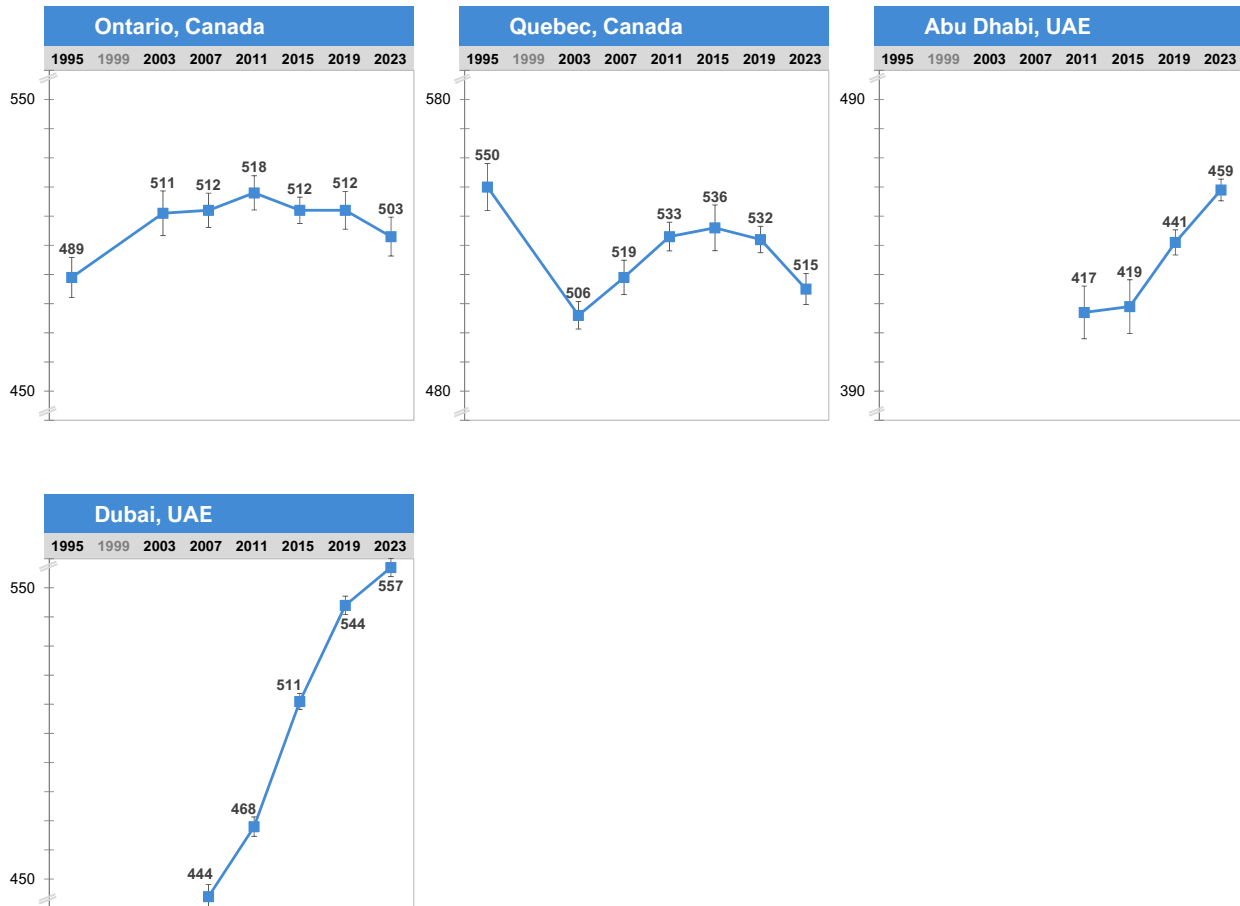
SOURCE: IEA's Trends in International Mathematics and Science Study - TIMSS 2023
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Benchmarking Participants

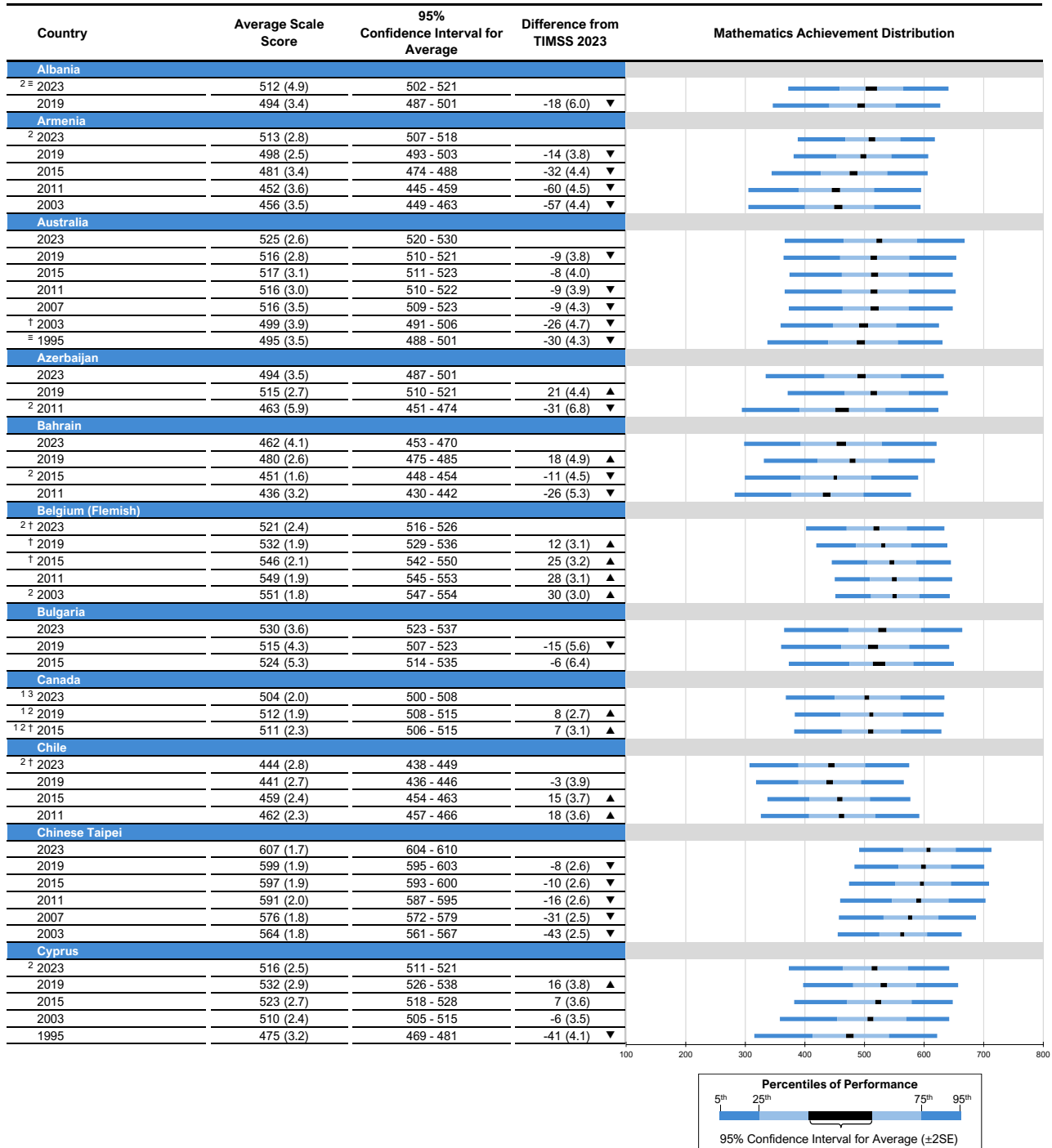


◇ There was no TIMSS fourth grade assessment in 1999. See Appendix A for country participation in previous TIMSS assessments.
 The scale interval is 10 points for each country, but a different part of the scale is shown according to each country's average achievement.
 I The black bars represent the 95% confidence interval.

SOURCE: IEA's Trends in International Mathematics and Science Study - TIMSS 2023
 Downloaded from <https://timss2023.org/results>

Exhibit 1.1.10: Trends in Average Mathematics Achievement and Scale Score Distributions

This exhibit reports differences in achievement across assessment years for the countries and benchmarking participants that have comparable data from previous TIMSS assessments. Symbols indicate if the row year is significantly higher (▲) or significantly lower (▼) than the performance in TIMSS 2023. See Appendix A for country participation in previous TIMSS assessments.



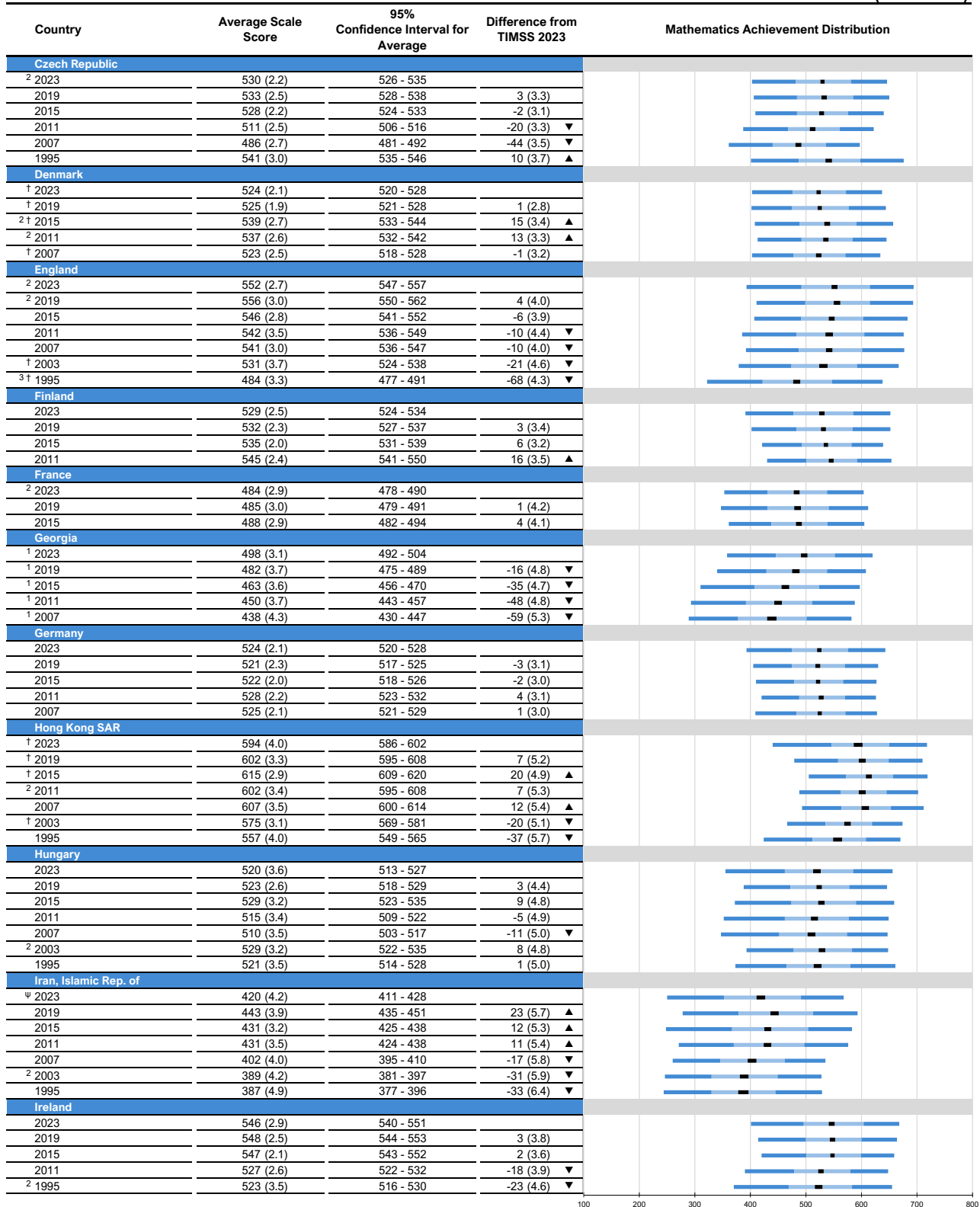
See Appendix A for country participation in previous TIMSS assessments.

() Standard errors appear in parentheses. Because of rounding some results may appear inconsistent.

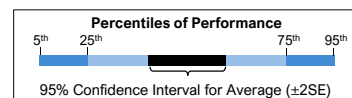
See Appendix B.2 for population coverage notes 1, 2, and 3. See Appendix B.5 for sampling guidelines and sampling participation notes †, ‡, and ≡.

Exhibit 1.1.10: Trends in Average Mathematics Achievement and Scale Score Distributions

(Continued)



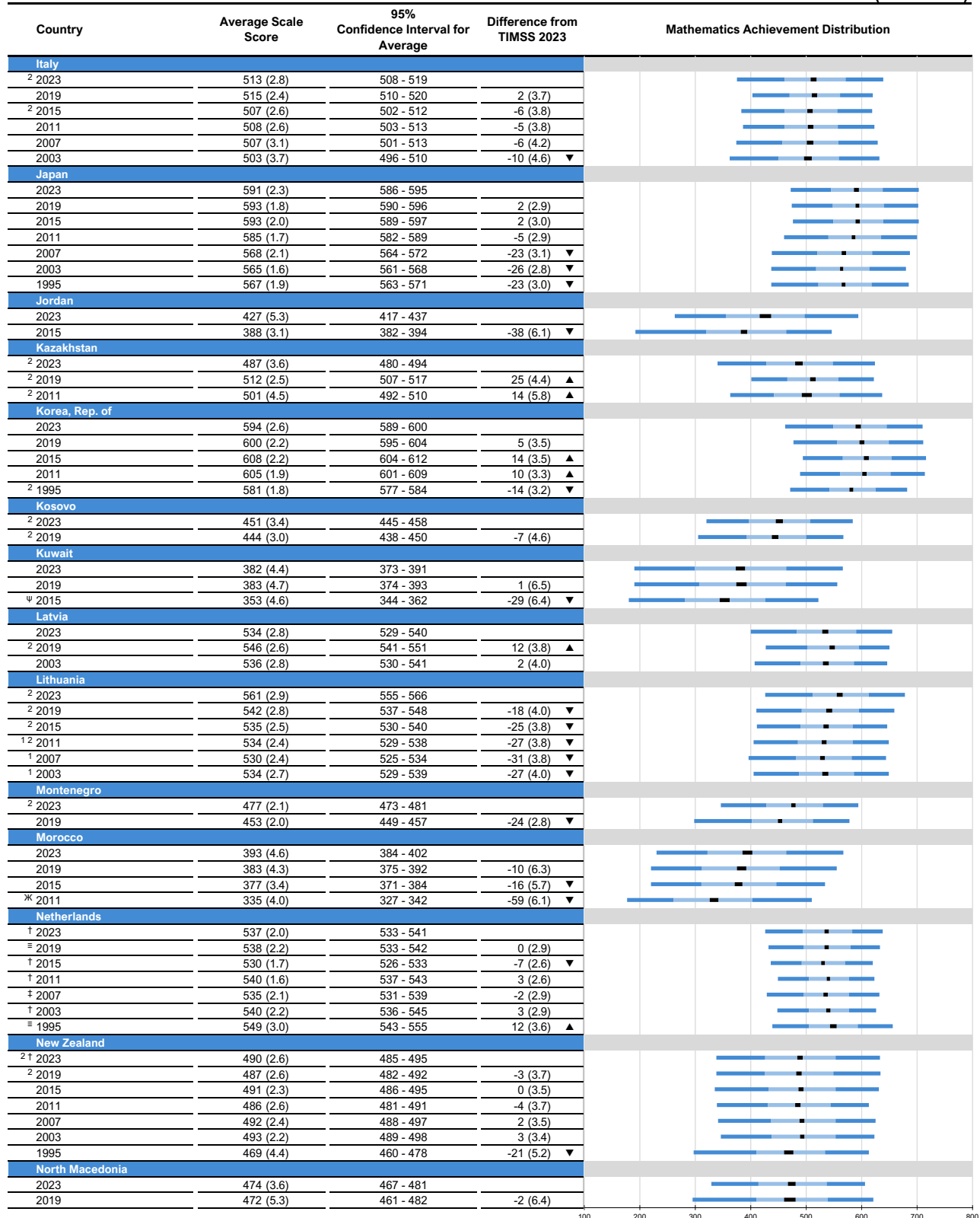
^ψ Reservations about reliability because the percentage of students with achievement too low for estimation exceeds 15% but does not exceed 25%.



SOURCE: IEA's Trends in International Mathematics and Science Study - TIMSS 2023
Downloaded from <https://timss2023.org/results>

Exhibit 1.1.10: Trends in Average Mathematics Achievement and Scale Score Distributions

(Continued)



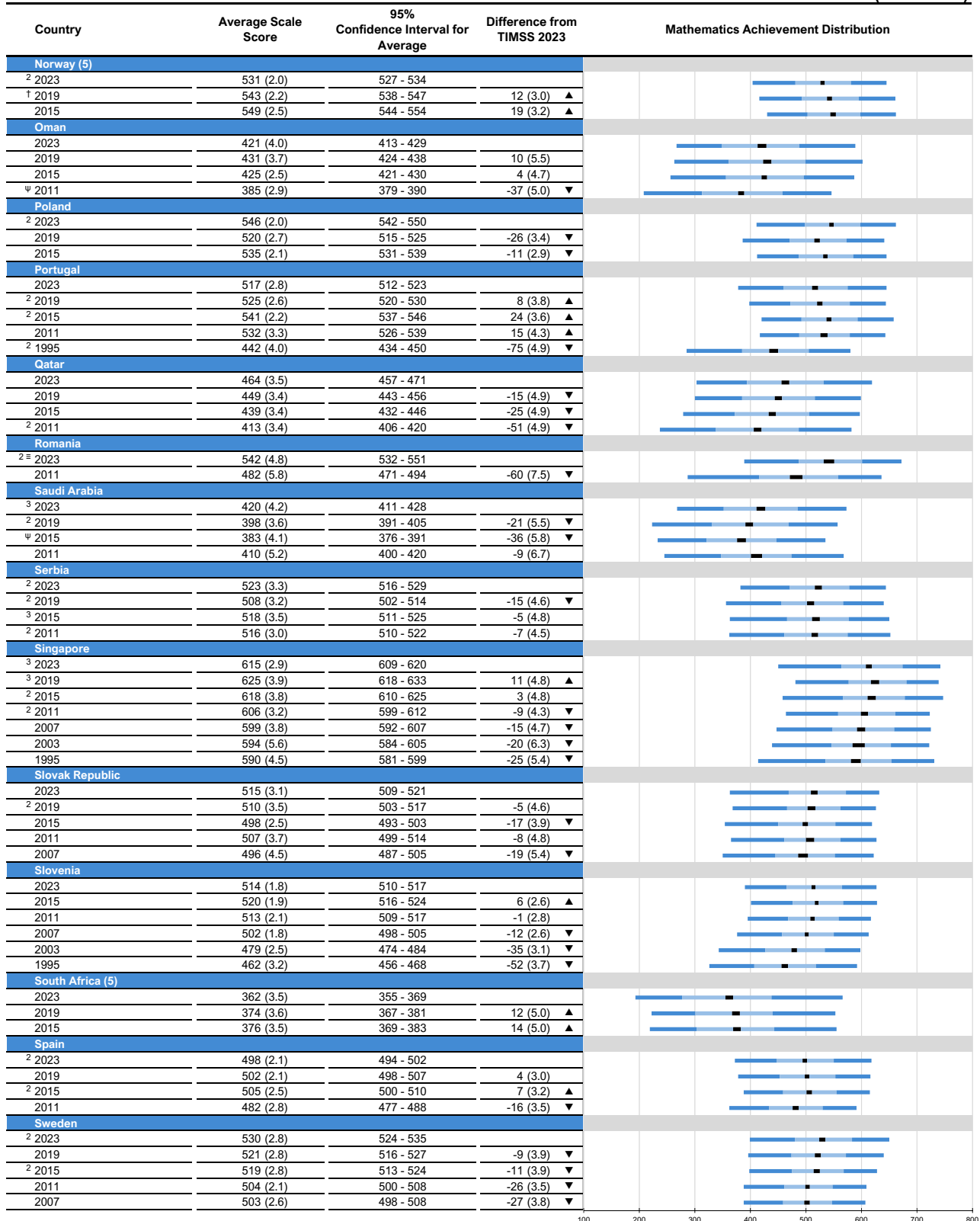
^ψ Reservations about reliability because the percentage of students with achievement too low for estimation exceeds 15% but does not exceed 25%.

[✱] Average achievement not reliably measured because the percentage of students with achievement too low for estimation exceeds 25%.

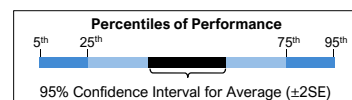
SOURCE: IEA's Trends in International Mathematics and Science Study - TIMSS 2023
Downloaded from <https://timss2023.org/results>

Exhibit 1.1.10: Trends in Average Mathematics Achievement and Scale Score Distributions

(Continued)



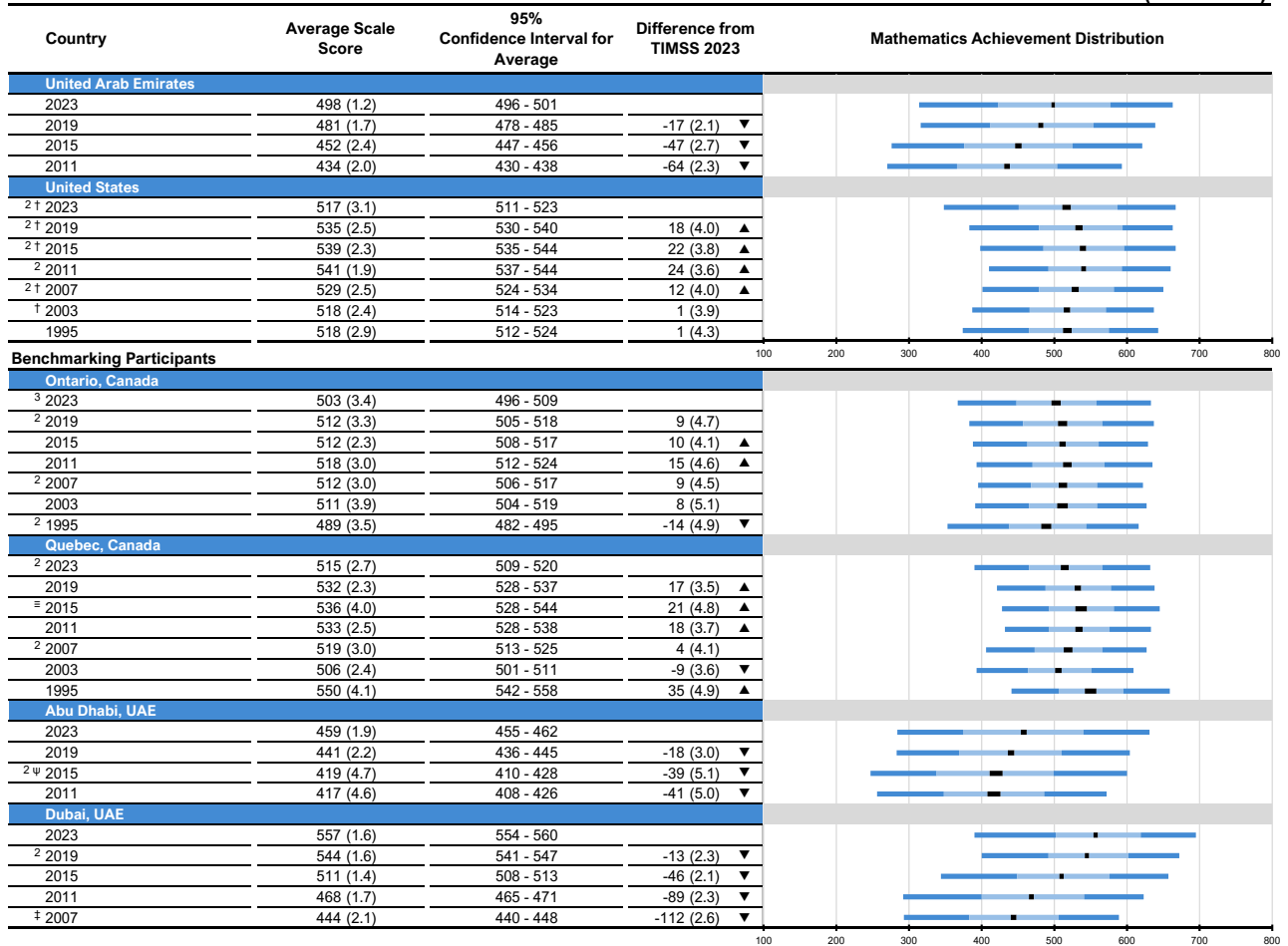
^ψ Reservations about reliability because the percentage of students with achievement too low for estimation exceeds 15% but does not exceed 25%.



SOURCE: IEA's Trends in International Mathematics and Science Study - TIMSS 2023
Downloaded from <https://timss2023.org/results>

Exhibit 1.1.10: Trends in Average Mathematics Achievement and Scale Score Distributions

(Continued)



Ψ Reservations about reliability because the percentage of students with achievement too low for estimation exceeds 15% but does not exceed 25%.

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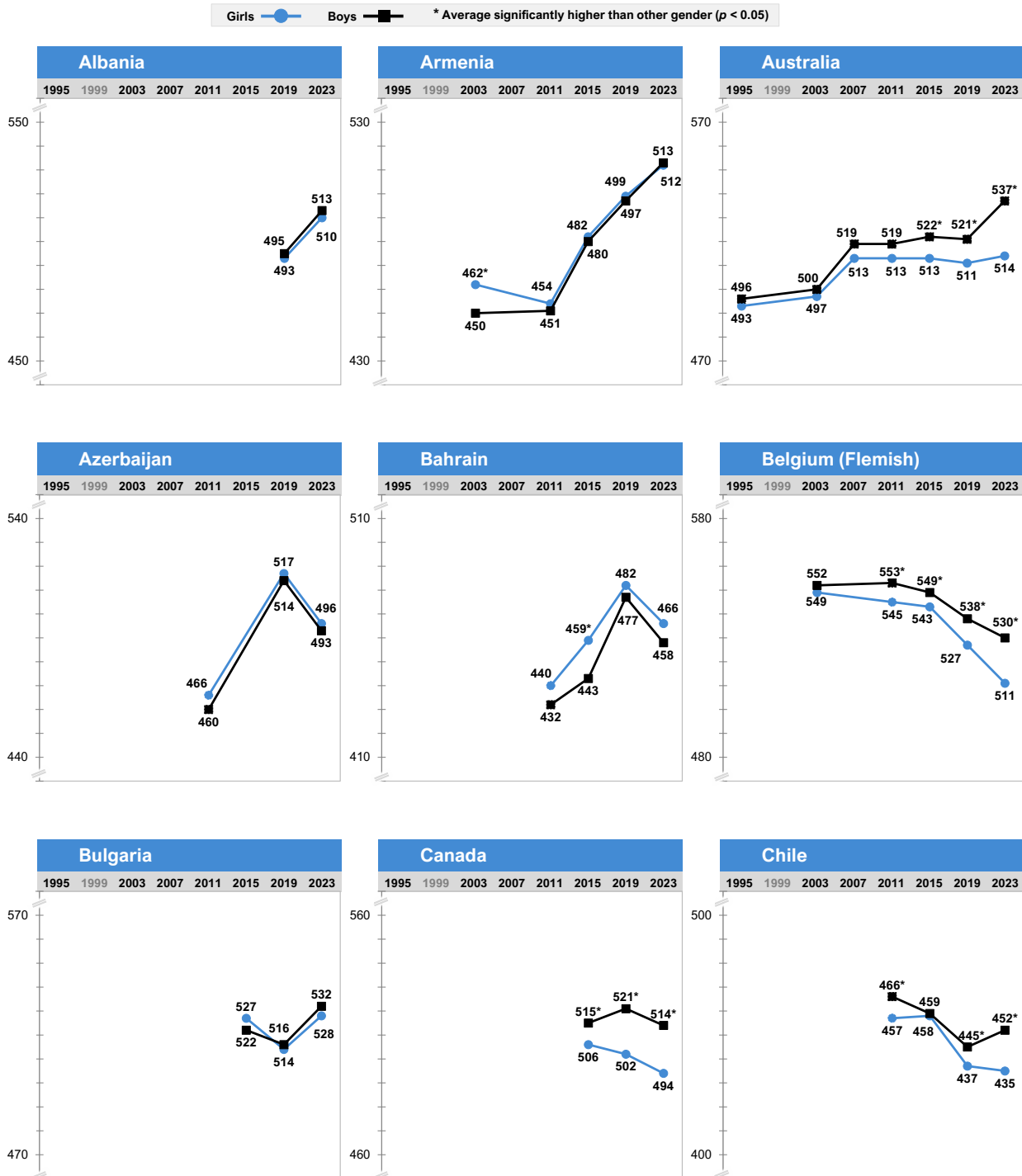
TIMSS & PIRLS
BOSTON COLLEGE

Trend Plots of Average Mathematics Achievement for Girls and Boys (Grade 4)

For the TIMSS 2023 countries with comparable data from previous TIMSS assessments, Exhibit 1.1.11 contains graphs of average mathematics achievement across assessment cycles for girls and boys. In each country graph, the y-axis ranges 120 points with a scale interval of 10 points, but a different part of the scale is shown according to each country's average achievement. Generally, the difference in average mathematics achievement between girls and boys has remained relatively stable across TIMSS assessments. However, the achievement gap favoring boys widened in some countries in TIMSS 2023. Notably, 14 countries with no statistically significant difference between girls and boys in TIMSS 2019 had a gap favoring boys in TIMSS 2023. In three countries the achievement gap was closed such that the difference between girls and boys was flagged as statistically significant in 2019, but not in 2023.

Exhibit 1.1.11: Trend Plots of Average Mathematics Achievement for Girls and Boys[◇]

This exhibit displays changes in achievement across assessment years for girls and boys for the countries and benchmarking participants that have comparable data from previous TIMSS assessments. The scale interval is 10 points for each country, but a different part of the scale is shown according to each country's average achievement. See Appendix A for country participation in previous assessments.



[◇] There was no TIMSS fourth grade assessment in 1999. See Appendix A for country participation in previous TIMSS assessments. The scale interval is 10 points for each country, but a different part of the scale is shown according to each country's average achievement. Students' gender information was obtained from school tracking data.

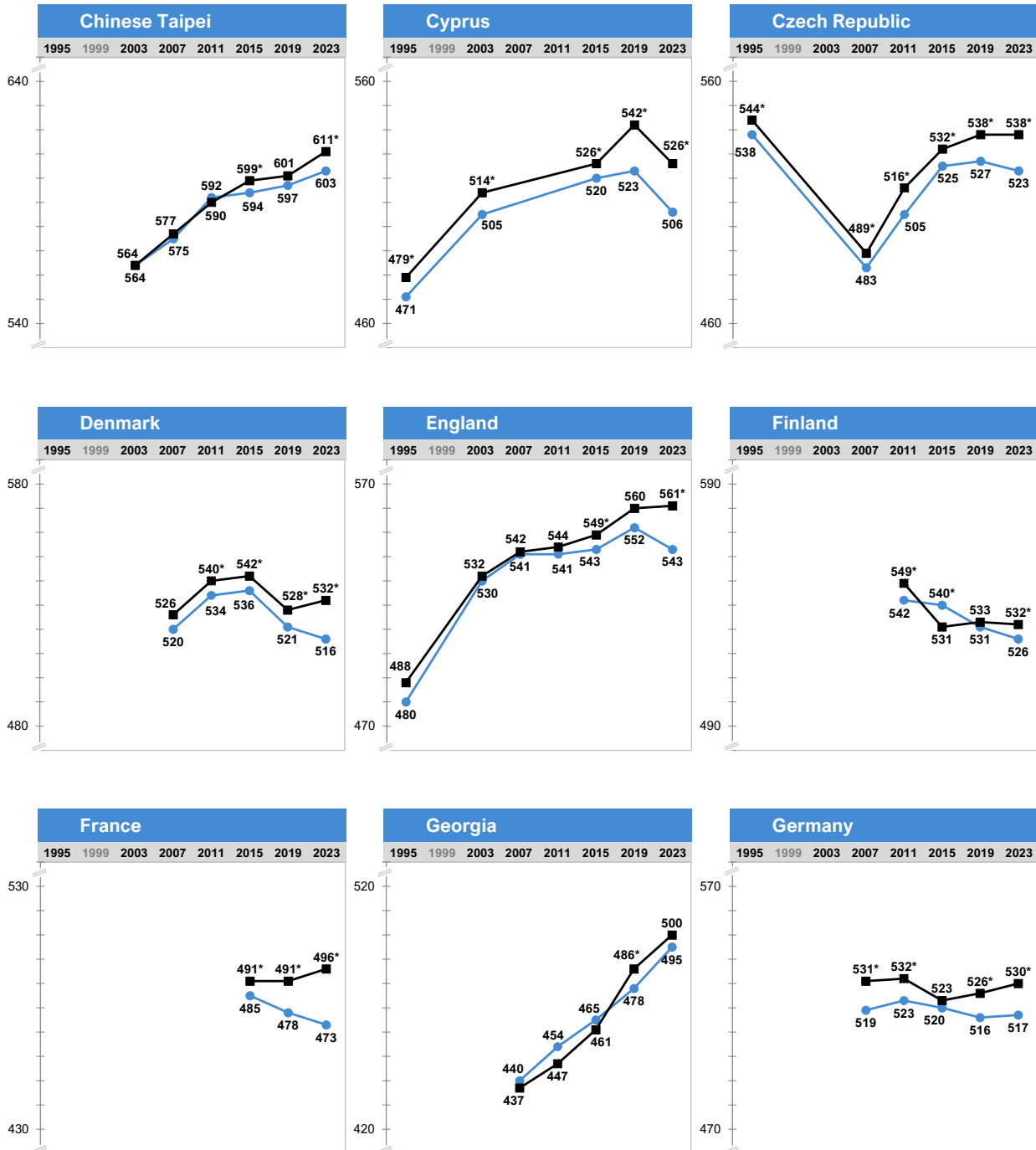
SOURCE: IEA's Trends in International Mathematics and Science Study - TIMSS 2023
Downloaded from <https://timss2023.org/results>

Exhibit 1.1.11: Trend Plots of Average Mathematics Achievement for Girls and Boys[◇]

(Continued)

This exhibit displays changes in achievement across assessment years for girls and boys for the countries and benchmarking participants that have comparable data from previous TIMSS assessments. The scale interval is 10 points for each country, but a different part of the scale is shown according to each country's average achievement. See Appendix A for country participation in previous assessments.

Girls —●— Boys —■— * Average significantly higher than other gender ($p < 0.05$)



[◇] There was no TIMSS fourth grade assessment in 1999. See Appendix A for country participation in previous TIMSS assessments. The scale interval is 10 points for each country, but a different part of the scale is shown according to each country's average achievement. Students' gender information was obtained from school tracking data.

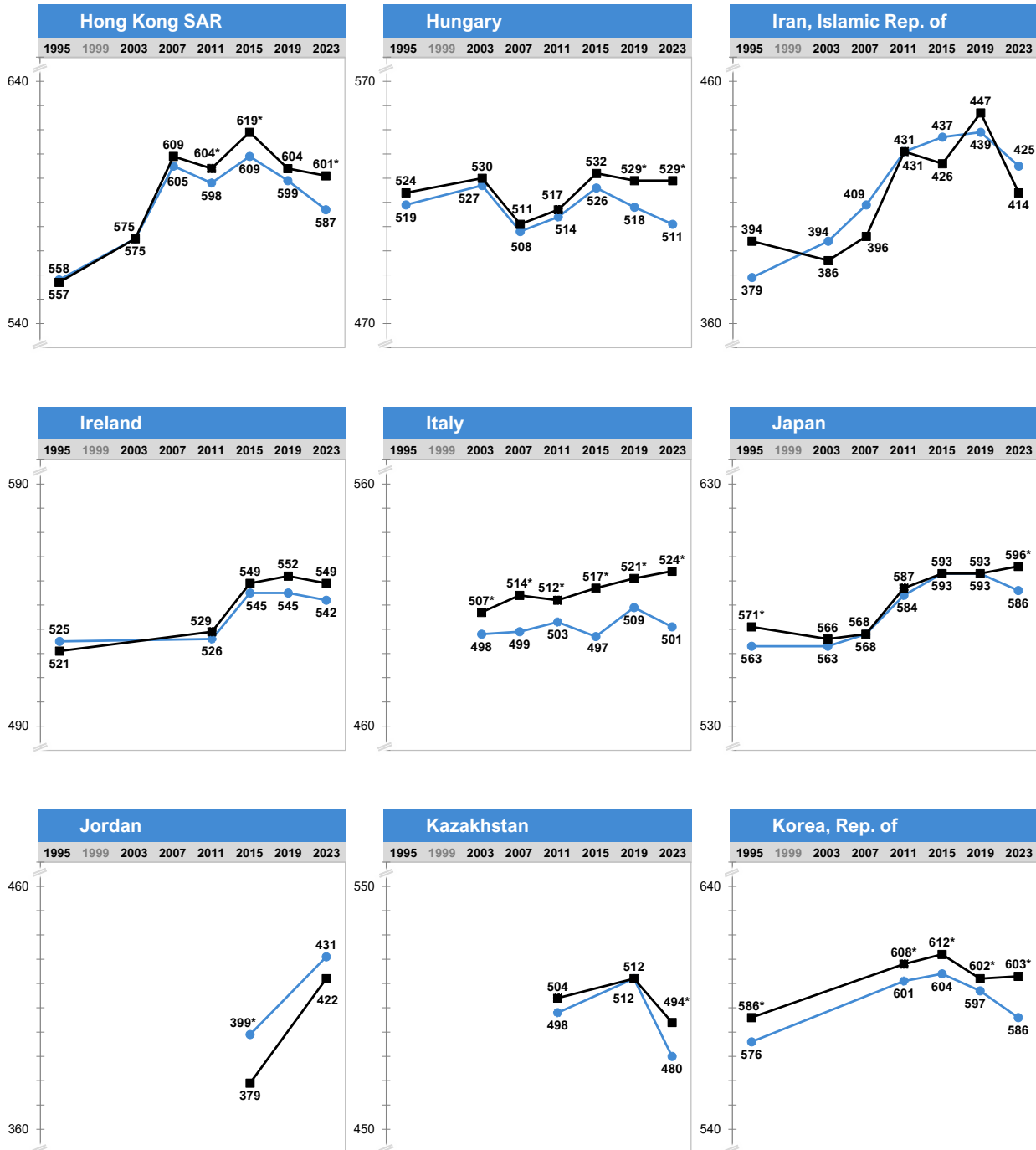
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Exhibit 1.1.11: Trend Plots of Average Mathematics Achievement for Girls and Boys[◇]

(Continued)

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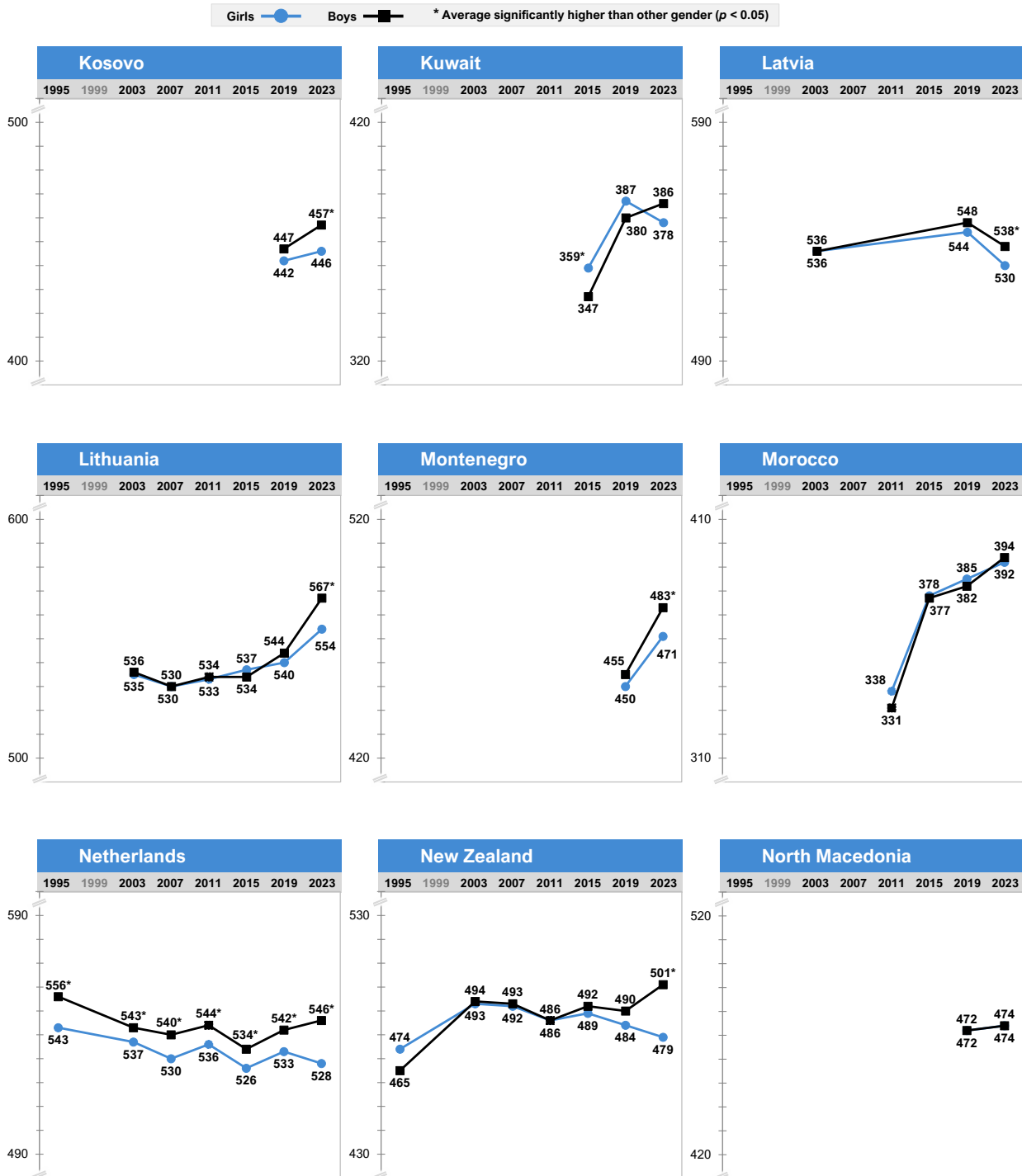
SOURCE: IEA's Trends in International Mathematics and Science Study - TIMSS 2023
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Exhibit 1.1.11: Trend Plots of Average Mathematics Achievement for Girls and Boys[◇]

(Continued)

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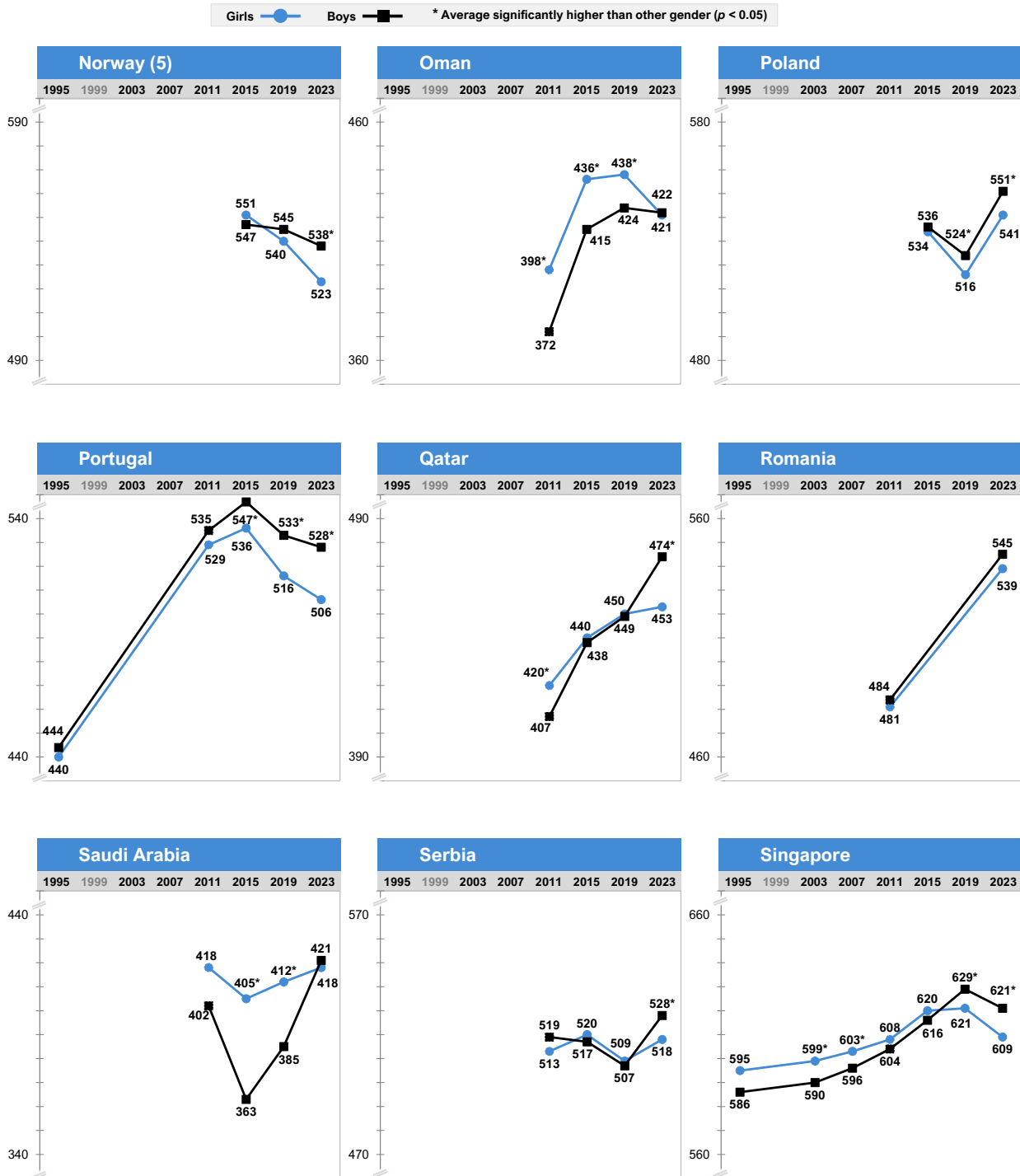
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Exhibit 1.1.11: Trend Plots of Average Mathematics Achievement for Girls and Boys[◇]

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This exhibit displays changes in achievement across assessment years for girls and boys for the countries and benchmarking participants that have comparable data from previous TIMSS assessments. The scale interval is 10 points for each country, but a different part of the scale is shown according to each country's average achievement. See Appendix A for country participation in previous assessments.



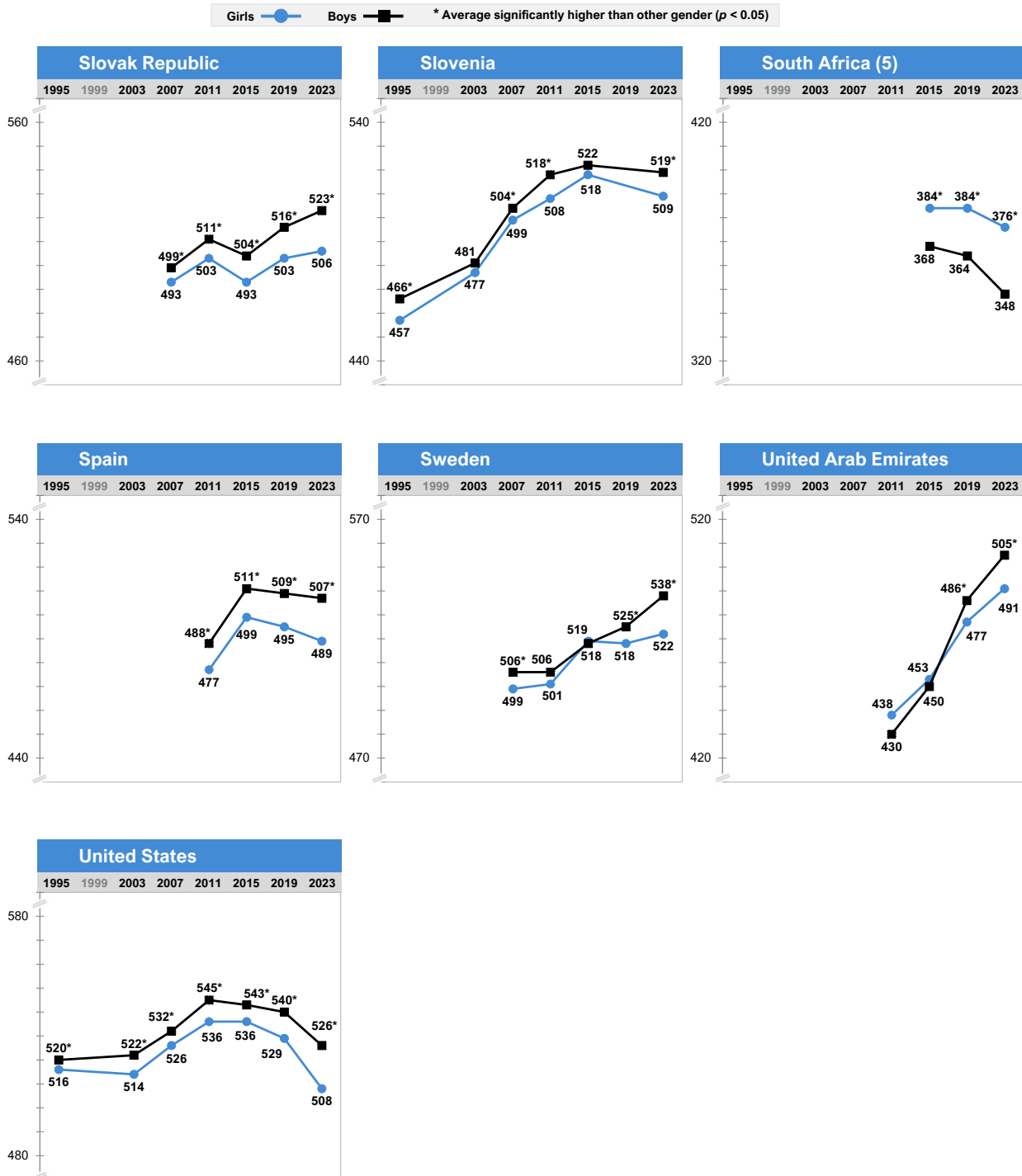
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Exhibit 1.1.11: Trend Plots of Average Mathematics Achievement for Girls and Boys[◇]

(Continued)

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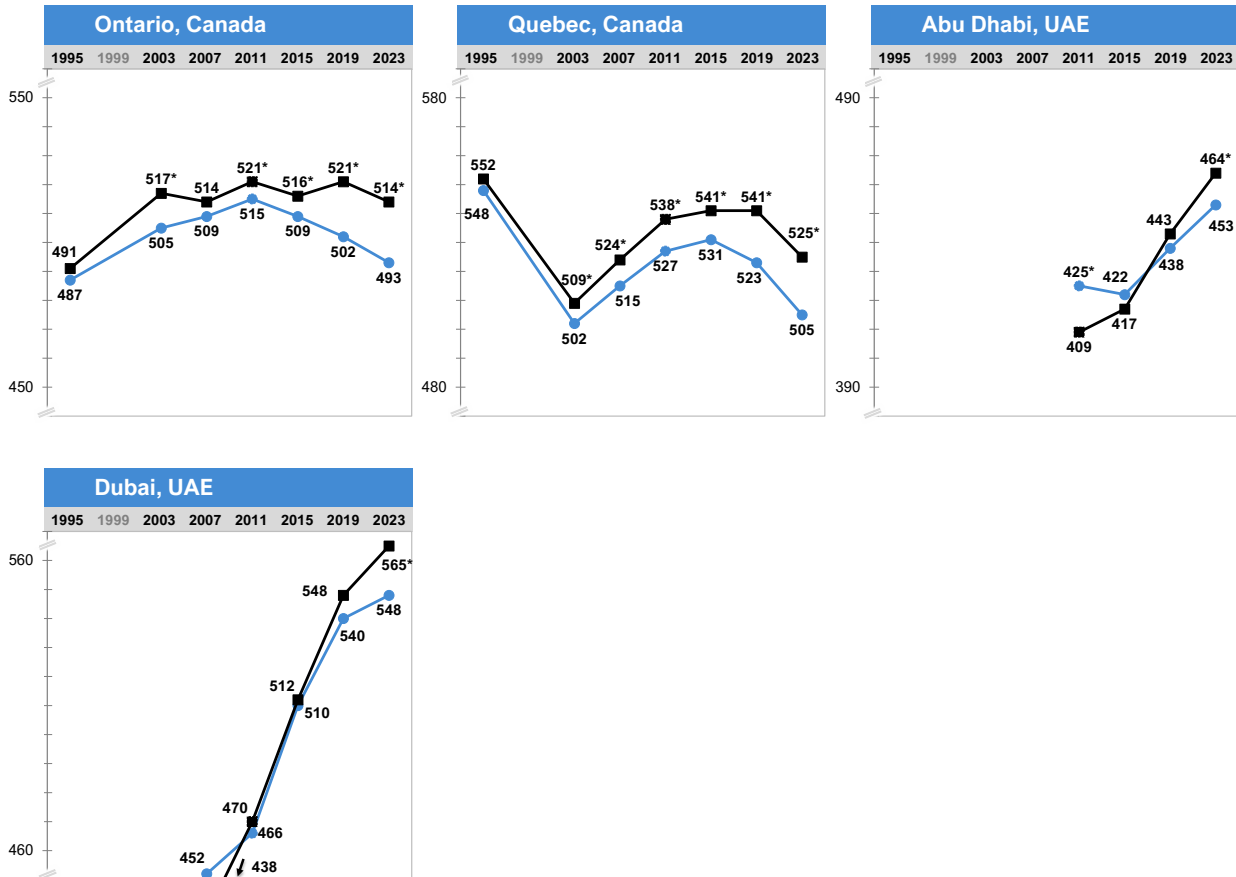
Exhibit 1.1.11: Trend Plots of Average Mathematics Achievement for Girls and Boys[◇]

(Continued)

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Girls — Boys * Average significantly higher than other gender ($p < 0.05$)

Benchmarking Participants



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SOURCE: IEA's Trends in International Mathematics and Science Study - TIMSS 2023
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Trends in Distributions of Students Reaching the TIMSS International Benchmarks of Mathematics Achievement (Grade 4)

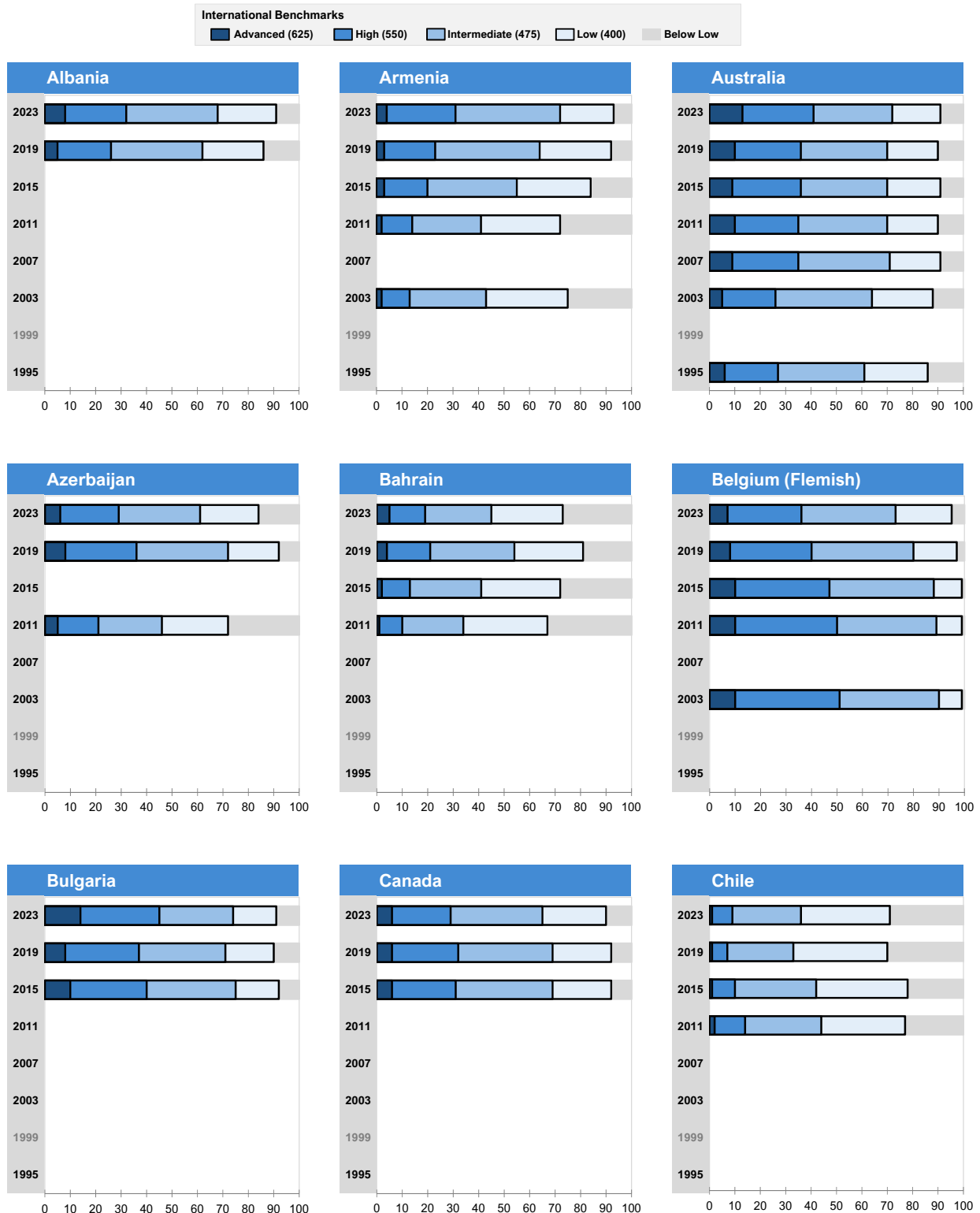
Exhibit 1.1.12 provides bar graphs for each country and benchmarking participant with comparable data from previous TIMSS assessments, presenting the distribution of students at the TIMSS International Benchmarks with a bar for each cycle from 1995 to 2023. Each bar displays the percentage of students reaching each of the International Benchmarks for a given assessment cycle. The shading of the bar segments ranges from dark to light blue, and each lighter-colored segment indicates the cumulative percentage of students that reached the less demanding benchmarks. Few students in most countries reach the Advanced Benchmark (darkest blue segment); more students reach the High Benchmark (dark blue plus medium blue segments); even more students reach the Intermediate Benchmark (indicated by three darker segments); finally, in most countries, a large majority of students reach the Low Benchmark (all shades of blue combined). The gray area indicates the percentage of students that did not reach the Low International Benchmark (i.e., were “below low”). The achievement of these students cannot be characterized by any of the TIMSS 2023 International Benchmarks.

Students reaching the Intermediate, High, and Advanced International Benchmarks demonstrated all the mathematics skills at their level but also those displayed by the students at the lower levels. Long-term increases in the percentages of students reaching the Low and Intermediate Benchmarks provide an indication that more students over time demonstrate a basic level of mathematics proficiency.

The short-term trends between TIMSS 2019 and TIMSS 2023 show more increases than decreases in percentages of students reaching the Advanced and High International Benchmarks. However, there were more decreases than increases in the percentages of students reaching the Intermediate and Low Benchmarks. Of the 49 countries that participated in both 2019 and 2023, 11 increased and 6 decreased at the Advanced Benchmark, 17 increased and 11 decreased at the High Benchmark, 10 increased and 13 decreased at the Intermediate Benchmark, and 7 increased and 16 decreased at the Low Benchmark.

Exhibit 1.1.12: Trends in Distributions of Students Reaching the TIMSS International Benchmarks of Mathematics Achievement[◇]

This exhibit displays changes in percentages of students reaching the TIMSS International Benchmarks across assessment cycles for the countries and benchmarking participants that have comparable data from previous assessments. See Appendix A for country participation in previous assessments.



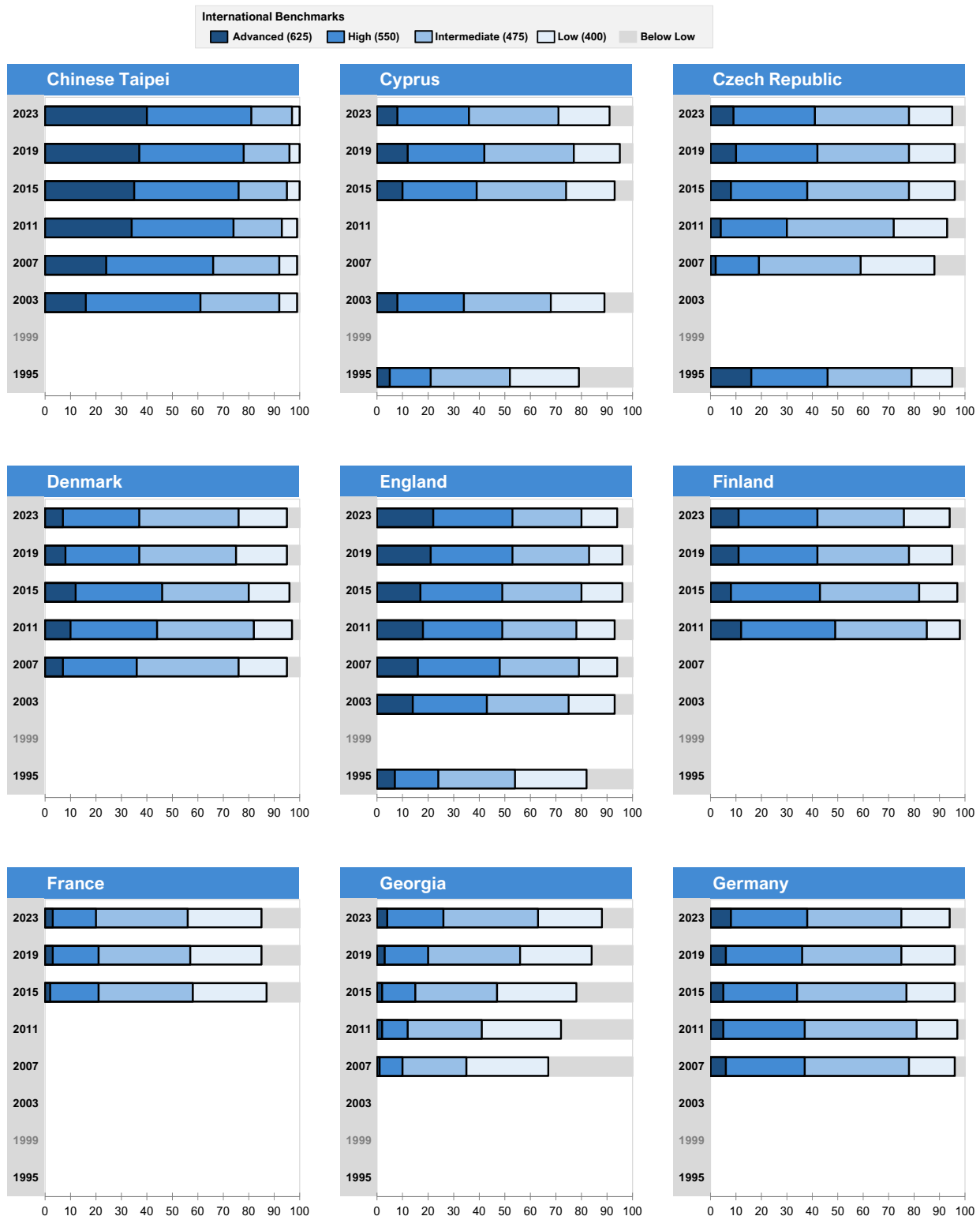
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Exhibit 1.1.12: Trends in Distributions of Students Reaching the TIMSS International Benchmarks of Mathematics Achievement[◊]

(Continued)

This exhibit displays changes in percentages of students reaching the TIMSS International Benchmarks across assessment cycles for the countries and benchmarking participants that have comparable data from previous assessments. See Appendix A for country participation in previous assessments.



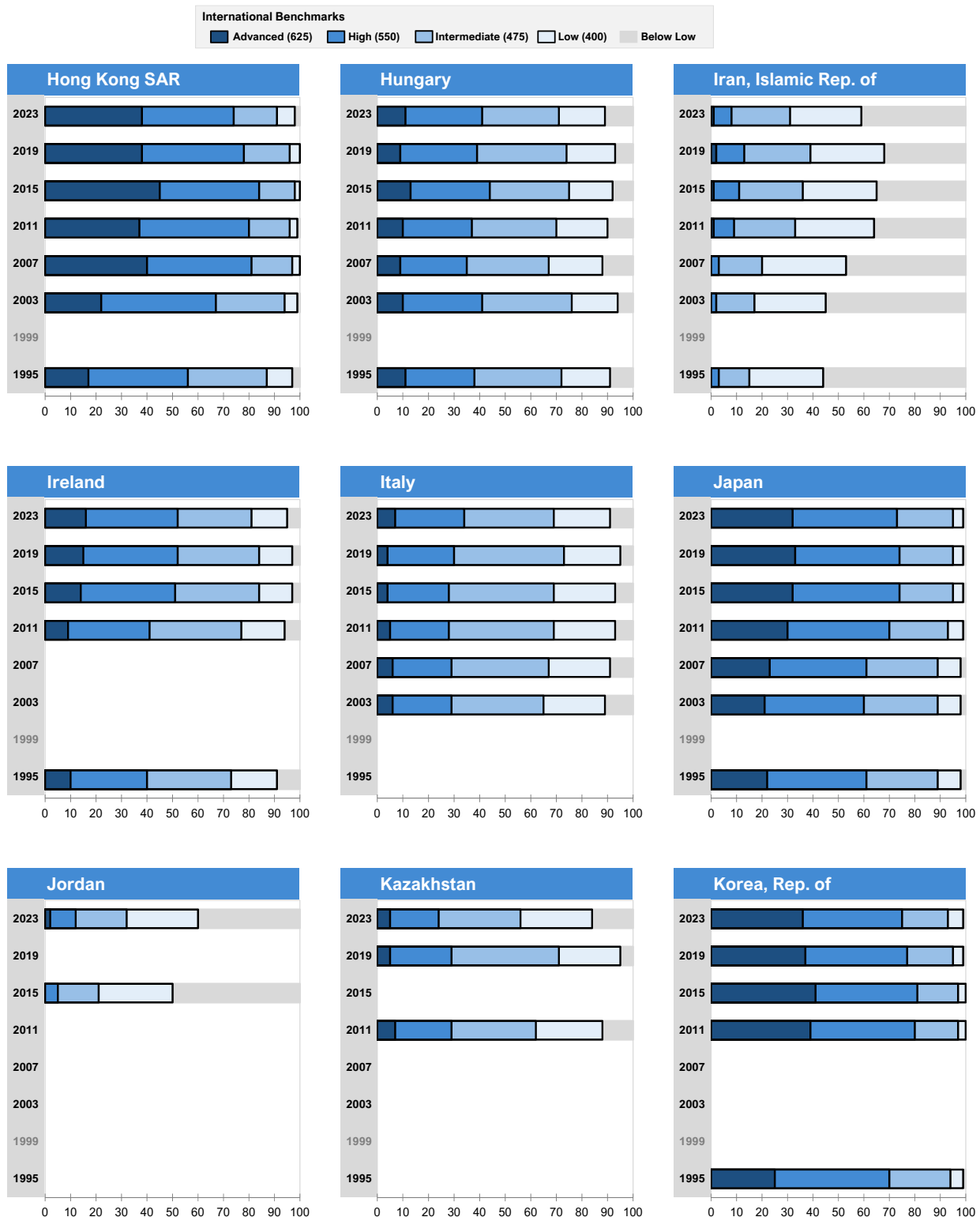
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Exhibit 1.1.12: Trends in Distributions of Students Reaching the TIMSS International Benchmarks of Mathematics Achievement[◊]

(Continued)

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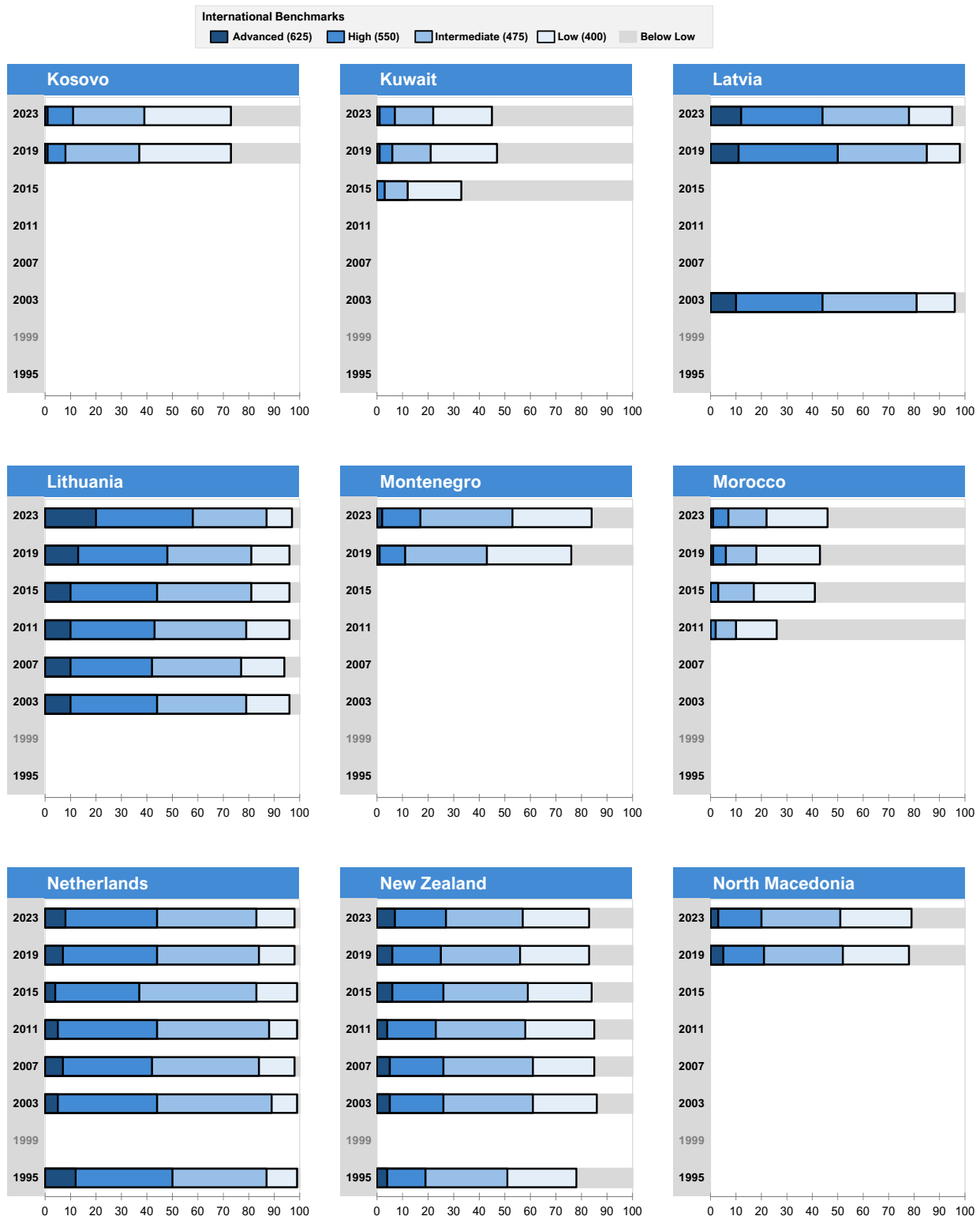
◊ There was no TIMSS fourth grade assessment in 1999. See Appendix A for country participation in previous TIMSS assessments.

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Exhibit 1.1.12: Trends in Distributions of Students Reaching the TIMSS International Benchmarks of Mathematics Achievement[◊]

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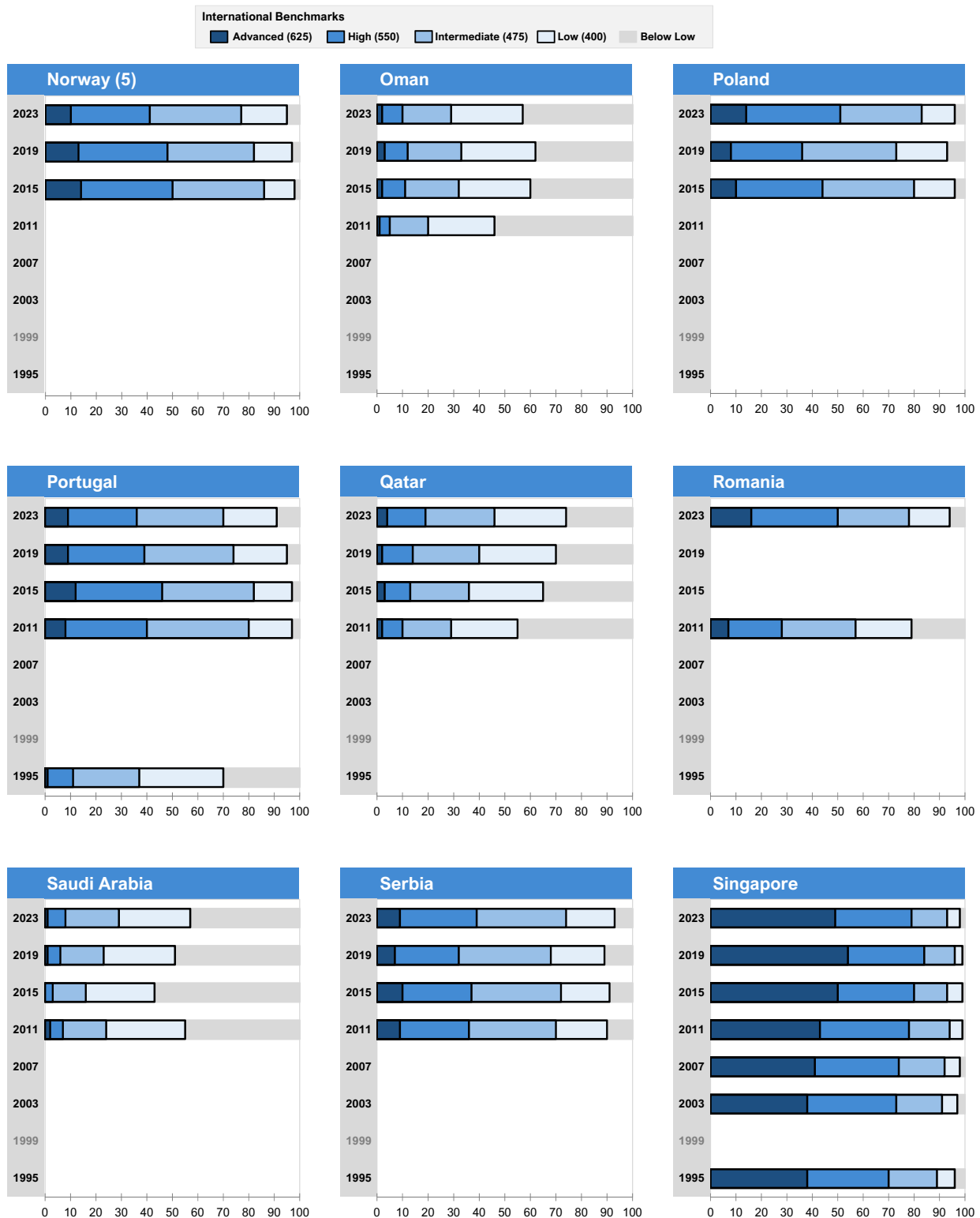
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Exhibit 1.1.12: Trends in Distributions of Students Reaching the TIMSS International Benchmarks of Mathematics Achievement[◊]

(Continued)

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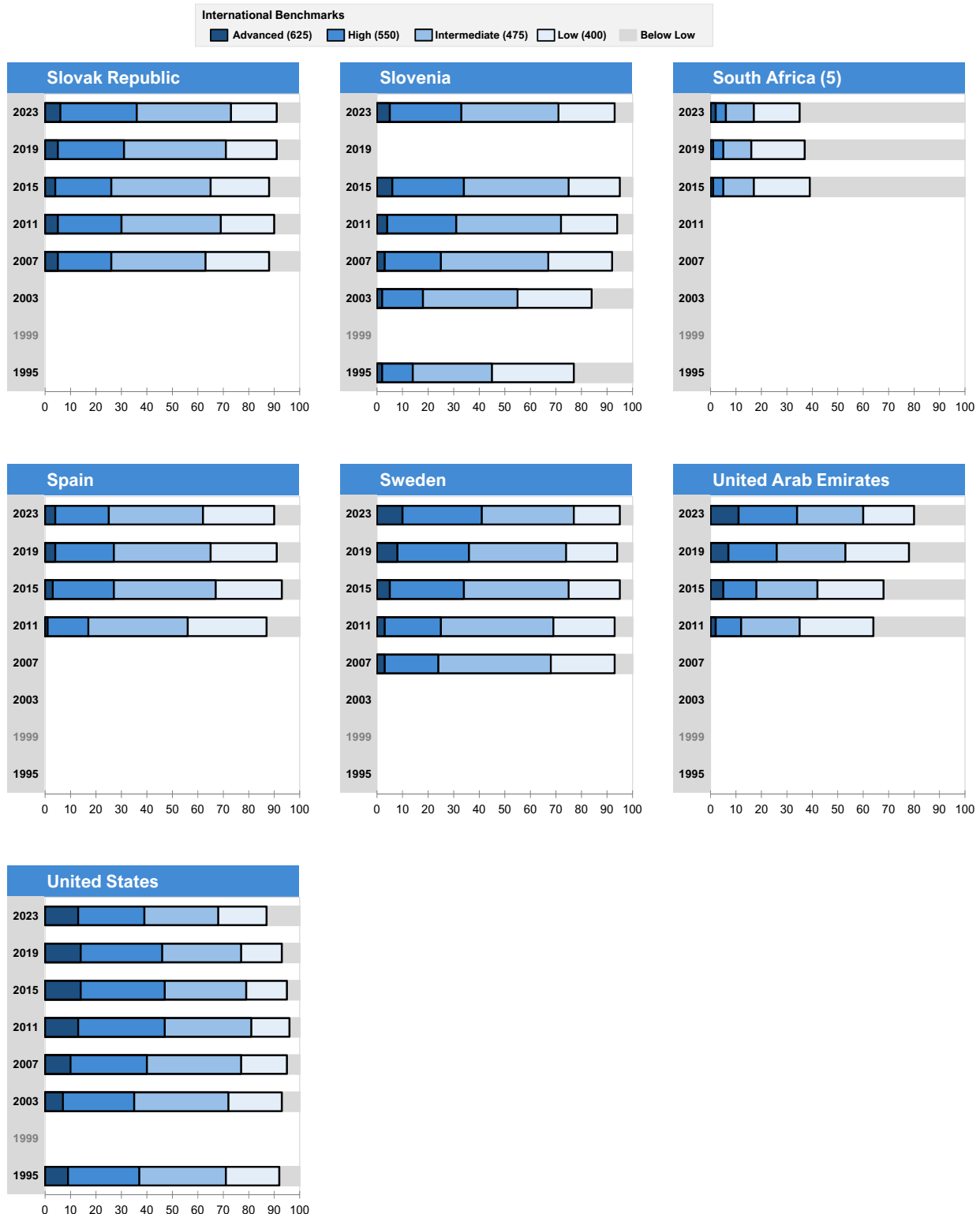
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SOURCE: IEA's Trends in International Mathematics and Science Study - TIMSS 2023
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Exhibit 1.1.12: Trends in Distributions of Students Reaching the TIMSS International Benchmarks of Mathematics Achievement⁰

(Continued)

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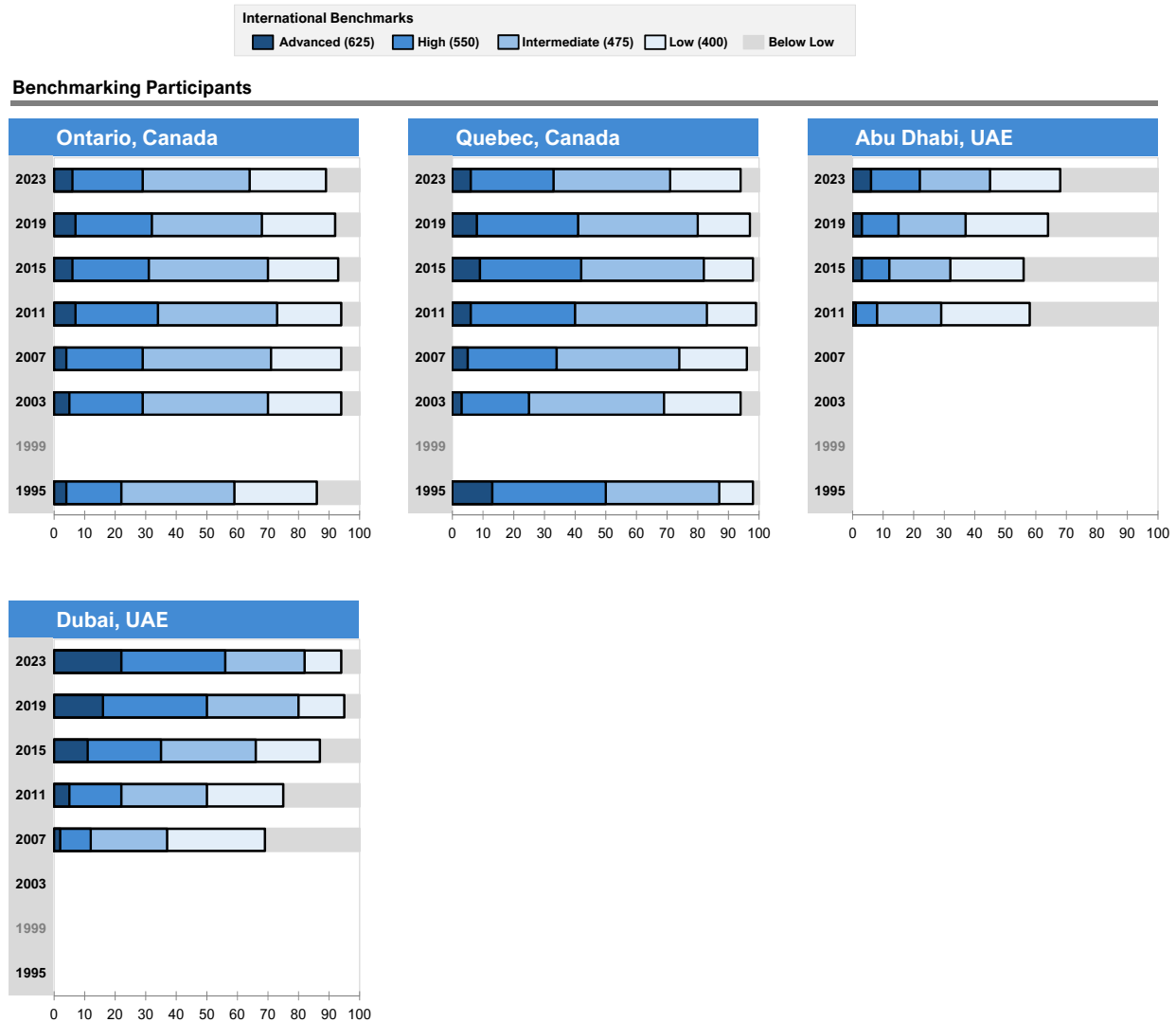
⁰ There was no TIMSS fourth grade assessment in 1999. See Appendix A for country participation in previous TIMSS assessments.

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Exhibit 1.1.12: Trends in Distributions of Students Reaching the TIMSS International Benchmarks of Mathematics Achievement[◇]

(Continued)

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SOURCE: IEA's Trends in International Mathematics and Science Study - TIMSS 2023
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Grade 4 Relative Achievement in Mathematics Content and Cognitive Domains

Introduction to Mathematics Content and Cognitive Domains (Grade 4)

The [TIMSS 2023 Mathematics Framework](#) specifies three content domains in fourth-grade mathematics: number, measurement and geometry, and data. The proportion of items in the assessment belonging to these three domains relates to the number of topics covered in each domain. These framework specifications informed assessment composition and item development.

Number Content Domain

Fifty percent of the fourth-grade assessment was devoted to the number content domain apportioned as follows: whole numbers (25%); expressions, simple equations, and relationships (15%); and fractions and decimals (10%). Whole numbers was the predominant category for the fourth-grade mathematics assessment, comprising addition, subtraction, multiplication, and division, as well as recognition of number properties including place value. Pre-algebra concepts included introduction to unknowns (variables) in simple equations and relating quantities. Students were asked to compare, round, and conduct simple computations with fractions and decimals.

Measurement and Geometry Content Domain

Thirty percent of the assessment was devoted to measurement and geometry (15% per topic). Measurement included measuring and relating lengths and quantities of mass, calculating areas and perimeters of simple polygons, and using cubes to determine volumes. Geometry included describing and drawing a variety of geometric figures and using geometric relationships to solve problems, as well as identifying the properties and characteristics of lines, angles, and a variety of two- and three-dimensional shapes.

Data Content Domain

The remaining 20 percent of the assessment was devoted to the data content domain, which consisted of two topic areas: reading and displaying data (10%) and interpreting, combining, and comparing data (10%). Data items required reading various forms of data displays, creating or completing data in graphs and charts, and interpreting data from multiple sources to draw conclusions.

Knowing, Applying, and Reasoning Cognitive Domains

The [TIMSS 2023 Mathematics Framework](#) also specifies the range of cognitive skills measured by the mathematics assessment across the content domains described above. The cognitive skills are categorized into three broad domains—knowing, applying, and reasoning. Forty percent of the fourth-grade assessment was devoted to

the knowing cognitive domain, 40 percent to applying, and 20 percent to reasoning. The knowing domain included accessing straightforward facts, concepts, and procedures through recall, simple computation, or classification. The applying domain focused on students' ability to act upon knowledge and conceptual understanding to devise strategies, implement them, and represent results. The reasoning domain targeted skills beyond solving familiar problems that may have been routinely practiced in mathematics lessons to encompass generalizations to unfamiliar situations, justifying approaches used, and integration across multistep problems.

The results in the content and cognitive subscales are presented to provide a more nuanced view of overall mathematics achievement. The comparison between overall mathematics achievement and particular subscales may indicate countries' relative strengths and weaknesses within overall mathematics. However, the subscales are based on only a subset of the assessment items, making them somewhat less robust than the overall mathematics achievement results based on the entire set of items.

For information about how the subscales for the content and cognitive domains were created, see Chapter 12 in the [TIMSS 2023 Technical Report](#).

Relative Achievement in Mathematics Content Domains (Grade 4)

Exhibit 1.1.13 shows countries' average achievement in each of the three mathematics content domains relative to their overall average achievement (presented from highest to lowest overall average achievement as the default sort). The exhibit also highlights differences based on a test of statistical significance between the average domain score and the overall mathematics score using an alpha level of 0.01. A smaller alpha level was used to flag statistical significance of subdomain differences to reduce the number of false positives that can be expected due to multiple comparisons across multiple countries and dependent sub-scores. Differences are computed for each student and averaged across the country, rather than comparing different groups of students as in previous exhibits in this section. This within-student dependency leads to considerably smaller standard errors (given in parentheses and reported together with the estimates in the exhibit) and more narrow confidence intervals.

Of the 57 participating countries for which mathematics content domain scores were estimated, 21 had a relative strength in number and 15 had a relative weakness; 16 had a relative strength in measurement and geometry and 17 had a relative weakness, and 17 had a relative strength in data and 25 had a relative weakness.

Exhibit 1.1.13: Relative Achievement in Mathematics Content Domains

Country	Overall Mathematics Average Scale Score	Number (94 Items)		Measurement and Geometry (49 Items)		Data (40 Items)	
		Average Scale Score	Difference from Overall Score	Average Scale Score	Difference from Overall Score	Average Scale Score	Difference from Overall Score
³ Singapore	615 (2.9)	613 (2.9)	-1 (0.8)	619 (3.1)	4 (0.8) ▲	616 (3.5)	1 (1.9)
Chinese Taipei	607 (1.7)	602 (1.6)	-5 (0.7) ▼	622 (1.8)	15 (1.1) ▲	601 (2.0)	-6 (1.2) ▼
Korea, Rep. of	594 (2.6)	586 (2.7)	-8 (1.4) ▼	605 (2.7)	11 (0.9) ▲	606 (3.0)	12 (2.3) ▲
[†] Hong Kong SAR	594 (4.0)	598 (4.2)	4 (1.1) ▲	598 (4.5)	4 (1.7) ▼	588 (4.0)	-6 (1.3) ▼
Japan	591 (2.3)	581 (2.3)	-9 (1.0) ▼	605 (2.7)	15 (1.2) ▲	598 (2.5)	7 (1.5) ▲
Macao SAR	582 (1.0)	578 (1.0)	-4 (0.8) ▼	591 (1.2)	9 (1.0) ▲	583 (1.2)	1 (0.8)
² Lithuania	561 (2.9)	562 (2.9)	1 (0.9)	556 (3.0)	-5 (1.5) ▼	567 (3.2)	6 (1.1) ▲
³ Türkiye (5)	553 (4.1)	550 (4.5)	-3 (1.8)	557 (4.4)	3 (1.3)	556 (3.9)	3 (1.8)
² England	552 (2.7)	556 (2.9)	4 (1.6)	539 (3.2)	-13 (1.6) ▼	561 (3.5)	9 (2.6) ▲
² Poland	546 (2.0)	541 (2.3)	-5 (1.0) ▼	557 (2.5)	11 (1.2) ▲	546 (2.4)	0 (1.7)
Ireland	546 (2.9)	548 (3.0)	2 (1.3)	540 (3.2)	-5 (1.9) ▼	546 (3.2)	0 (1.7)
² Romania	542 (4.8)	552 (5.0)	10 (1.4) ▲	538 (5.2)	-4 (1.5)	519 (5.4)	-23 (1.9) ▼
[†] Netherlands	537 (2.0)	536 (2.2)	-1 (1.2)	534 (2.8)	-3 (2.2)	544 (2.4)	7 (1.4) ▲
Latvia	534 (2.8)	533 (2.9)	-1 (1.8)	540 (3.1)	6 (1.4) ▲	532 (3.1)	-2 (1.7)
² Norway (5)	531 (2.0)	530 (2.2)	0 (1.2)	526 (2.6)	-5 (2.0)	537 (2.1)	6 (1.1) ▲
² Czech Republic	530 (2.2)	534 (2.1)	4 (1.0) ▲	537 (2.0)	6 (1.1) ▲	512 (2.9)	-19 (2.1) ▼
² Sweden	530 (2.8)	527 (2.6)	-3 (1.0) ▼	532 (2.8)	2 (1.6)	535 (3.0)	6 (1.4) ▲
Bulgaria	530 (3.6)	545 (3.3)	15 (0.9) ▲	527 (3.9)	-3 (2.0)	506 (4.8)	-24 (2.2) ▼
Finland	529 (2.5)	522 (2.6)	-7 (0.9) ▼	539 (2.7)	9 (1.5) ▲	536 (3.0)	7 (0.9) ▲
Australia	525 (2.6)	520 (2.7)	-5 (1.2) ▼	522 (3.0)	-3 (1.7)	540 (2.7)	15 (1.4) ▲
Germany	524 (2.1)	524 (2.5)	0 (1.4)	527 (2.3)	4 (1.3) ▲	520 (2.6)	-3 (1.2) ▼
[†] Denmark	524 (2.1)	516 (2.3)	-8 (0.8) ▼	530 (2.1)	6 (1.2) ▲	532 (2.3)	8 (1.3) ▲
² Serbia	523 (3.3)	529 (3.3)	6 (1.0) ▲	524 (3.8)	1 (2.1)	505 (4.0)	-18 (2.5) ▼
^{2†} Belgium (Flemish)	521 (2.4)	513 (2.3)	-8 (0.9) ▼	536 (3.0)	15 (1.3) ▲	524 (2.7)	3 (1.2)
Hungary	520 (3.6)	527 (3.4)	7 (1.4) ▲	516 (3.7)	-4 (2.1)	504 (3.9)	-16 (1.5) ▼
Portugal	517 (2.8)	516 (2.8)	-1 (1.1)	510 (3.0)	-8 (1.0) ▼	528 (3.0)	10 (1.9) ▲
^{2†} United States	517 (3.1)	523 (3.1)	6 (1.0) ▲	499 (3.3)	-18 (1.2) ▼	519 (3.1)	3 (0.9) ▲
² Cyprus	516 (2.5)	527 (2.3)	10 (0.8) ▲	508 (2.6)	-8 (0.9) ▼	501 (3.2)	-15 (1.5) ▼
Slovak Republic	515 (3.1)	518 (2.9)	3 (1.3)	513 (3.0)	-2 (1.5)	508 (3.7)	-7 (2.5) ▼
Slovenia	514 (1.8)	513 (1.9)	-1 (1.6)	515 (2.0)	2 (1.6)	515 (2.2)	1 (1.5)
² Italy	513 (2.8)	515 (2.7)	2 (1.0)	512 (3.3)	-1 (2.2)	505 (3.4)	-8 (1.6) ▼
² Armenia	513 (2.8)	530 (2.7)	17 (1.3) ▲	507 (3.1)	-5 (1.7) ▼	470 (3.2)	-43 (1.4) ▼
² Albania	512 (4.9)	520 (4.9)	8 (1.3) ▲	512 (5.2)	1 (1.8)	488 (5.7)	-24 (3.2) ▼
¹³ Canada	504 (2.0)	501 (2.1)	-3 (0.7) ▼	499 (2.2)	-5 (0.7) ▼	515 (2.3)	11 (0.7) ▲
² Spain	498 (2.1)	497 (2.3)	-2 (0.7)	497 (2.4)	-1 (1.4)	502 (2.2)	4 (1.2) ▲
United Arab Emirates	498 (1.2)	501 (1.1)	3 (0.5) ▲	489 (1.5)	-9 (0.6) ▼	498 (1.5)	0 (0.5)
¹ Georgia	498 (3.1)	512 (3.0)	14 (1.4) ▲	482 (3.9)	-16 (1.8) ▼	476 (3.3)	-22 (1.5) ▼
Azerbaijan	494 (3.5)	506 (3.3)	12 (1.1) ▲	491 (3.5)	-4 (1.8)	465 (3.9)	-29 (1.5) ▼
^{2†} New Zealand	490 (2.6)	487 (2.4)	-3 (1.1) ▼	484 (2.5)	-7 (1.6) ▼	503 (2.5)	13 (1.7) ▲
² Belgium (French)	489 (2.4)	480 (2.5)	-9 (1.0) ▼	506 (2.4)	17 (1.1) ▲	490 (3.2)	1 (2.3)
² Kazakhstan	487 (3.6)	498 (3.4)	11 (1.2) ▲	475 (3.5)	-13 (1.3) ▼	472 (3.8)	-15 (1.6) ▼
² France	484 (2.9)	479 (3.0)	-5 (1.6) ▼	495 (3.1)	11 (1.4) ▲	480 (3.0)	-5 (2.3)
² Montenegro	477 (2.1)	481 (1.7)	4 (1.3) ▲	480 (2.0)	3 (1.6)	458 (1.9)	-19 (2.1) ▼
North Macedonia	474 (3.6)	479 (3.2)	6 (1.4) ▲	475 (3.4)	1 (1.6)	453 (4.0)	-21 (2.7) ▼
Qatar	464 (3.5)	465 (3.6)	2 (1.0)	447 (3.7)	-17 (1.8) ▼	472 (3.6)	8 (1.0) ▲
Bahrain	462 (4.1)	463 (4.0)	1 (1.5)	453 (4.3)	-9 (1.6) ▼	463 (3.8)	1 (1.7)
² Kosovo	451 (3.4)	457 (3.4)	5 (1.4) ▲	457 (3.7)	6 (1.9) ▲	429 (3.7)	-22 (1.6) ▼
[†] Bosnia & Herzegovina	447 (3.2)	454 (3.6)	7 (1.5) ▲	448 (3.5)	1 (1.7)	427 (4.3)	-20 (2.2) ▼
^{2†} Chile	444 (2.8)	432 (2.5)	-11 (1.9) ▼	442 (2.5)	-1 (1.4)	464 (3.0)	20 (2.8) ▲
Uzbekistan	443 (3.2)	457 (3.2)	13 (0.9) ▲	438 (3.3)	-5 (1.1) ▼	407 (4.2)	-36 (2.2) ▼
Jordan	427 (5.3)	437 (5.6)	10 (1.2) ▲	414 (5.7)	-13 (1.8) ▼	404 (5.7)	-23 (1.6) ▼
Oman	421 (4.0)	421 (4.2)	-1 (0.9)	423 (4.3)	1 (1.6)	416 (4.1)	-6 (1.1) ▼
⁹ Iran, Islamic Rep. of	420 (4.2)	423 (4.1)	3 (1.1) ▲	424 (4.2)	4 (1.3) ▲	401 (4.5)	-19 (1.4) ▼
³ Saudi Arabia	420 (4.2)	418 (4.2)	-1 (1.6)	419 (4.0)	0 (1.6)	415 (4.5)	-5 (1.7) ▼
Morocco	393 (4.6)	392 (4.7)	-1 (1.6)	392 (5.2)	-1 (2.1)	394 (5.2)	1 (2.0)
Kuwait	382 (4.4)	383 (4.4)	1 (1.6)	378 (4.5)	-4 (2.6)	378 (5.8)	-4 (3.4)
South Africa (5)	362 (3.5)	362 (3.6)	1 (0.9)	353 (3.8)	-8 (1.5) ▼	362 (4.2)	0 (1.6)
² Brazil	400 (3.4)	--	--	--	--	--	--
Benchmarking Participants							
Dubai, UAE	557 (1.6)	559 (1.6)	2 (0.7) ▲	549 (1.6)	-8 (1.5) ▼	563 (1.6)	6 (1.0) ▲
² Quebec, Canada	515 (2.7)	510 (2.7)	-5 (1.3) ▼	521 (3.1)	6 (2.0) ▲	518 (3.2)	3 (1.3)
Sharjah, UAE	504 (3.3)	507 (3.3)	3 (1.0) ▲	498 (3.8)	-5 (1.2) ▼	500 (3.5)	-4 (1.3) ▼
³ Ontario, Canada	503 (3.4)	499 (3.4)	-4 (0.9) ▼	497 (3.7)	-5 (1.2) ▼	516 (4.0)	13 (1.6) ▲
Abu Dhabi, UAE	459 (1.9)	462 (1.7)	4 (0.9) ▲	446 (2.7)	-13 (1.3) ▼	457 (2.4)	-2 (0.9)

▲ ▼ Subscale score significantly different from overall score ($p < 0.01$)

Numbers of items are based on the TIMSS 2023 fourth-grade mathematics items included in scaling.

() Standard errors appear in parentheses. Because of rounding some results may appear inconsistent.

See Appendix B.2 for population coverage notes 1, 2, and 3. See Appendix B.5 for sampling guidelines and sampling participation notes †, ‡, and Ξ.

Ψ Reservations about reliability because the percentage of students with achievement too low for estimation exceeds 15% but does not exceed 25%.

A dash (-) indicates comparable data not available because average achievement could not be accurately estimated.

SOURCE: IEA's Trends in International Mathematics and Science Study - TIMSS 2023
Downloaded from <https://timss2023.org/results>

Relative Achievement in Mathematics Cognitive Domains (Grade 4)

Exhibit 1.1.14 shows countries' average achievement estimates in the knowing, applying, and reasoning cognitive domains relative to their overall average achievement estimates (sorted from highest to lowest overall average achievement as the default sort). The exhibit also flags differences based on a test of statistical significance between the average domain score and the overall mathematics score using an alpha level of 0.01. A smaller alpha level was used to flag statistical significance of subdomain differences to reduce the number of false positives that can be expected due to multiple comparisons across multiple countries and dependent sub-scores. Differences are computed for each student and averaged across the country, rather than comparing different groups of students as in previous exhibits in this section. This within student dependency leads to considerably smaller standard errors (given in parentheses and reported together with the estimates in the exhibit) and more narrow confidence intervals.

Few countries had a relative strength (and more countries had a relative weakness) in the reasoning cognitive domain compared to knowing and applying. In the knowing domain, 13 countries had a relative strength and 17 had a relative weakness. In the applying domain, 11 countries had a relative strength and seven had a relative weakness. In reasoning, nine countries had a relative strength and 16 had a relative weakness.

Exhibit 1.1.14: Relative Achievement in Mathematics Cognitive Domains

Country	Overall Mathematics Average Scale Score	Knowing (58 Items)		Applying (85 Items)		Reasoning (40 Items)	
		Average Scale Score	Difference from Overall Score	Average Scale Score	Difference from Overall Score	Average Scale Score	Difference from Overall Score
³ Singapore	615 (2.9)	624 (2.9)	10 (1.1) ▲	615 (2.9)	0 (0.8)	609 (3.0)	-6 (0.7) ▼
Chinese Taipei	607 (1.7)	619 (1.7)	12 (1.3) ▲	612 (1.8)	5 (1.3) ▲	589 (1.8)	-18 (0.7) ▼
Korea, Rep. of	594 (2.6)	600 (3.0)	5 (1.5) ▲	593 (2.6)	-1 (1.2)	592 (2.9)	-2 (1.5)
[†] Hong Kong SAR	594 (4.0)	598 (4.0)	4 (1.2) ▲	592 (4.2)	-2 (1.1)	595 (4.4)	1 (2.5)
Japan	591 (2.3)	591 (2.5)	1 (1.7)	597 (2.5)	6 (1.2) ▲	576 (2.5)	-15 (0.8) ▼
Macao SAR	582 (1.0)	582 (1.5)	0 (1.0)	583 (1.3)	1 (1.2)	582 (1.3)	0 (1.4)
² Lithuania	561 (2.9)	556 (2.8)	-4 (1.4) ▼	566 (2.9)	5 (1.2) ▲	554 (3.1)	-7 (0.8) ▼
³ Türkiye (5)	553 (4.1)	543 (4.9)	-10 (2.6) ▼	559 (4.4)	6 (1.2) ▲	551 (4.5)	-3 (1.4)
² England	552 (2.7)	558 (2.9)	6 (1.1) ▲	550 (2.7)	-2 (1.1)	550 (3.3)	-2 (2.0)
² Poland	546 (2.0)	539 (2.3)	-7 (1.4) ▼	547 (2.4)	1 (1.3)	550 (2.6)	4 (1.3) ▲
Ireland	546 (2.9)	551 (3.3)	5 (1.4) ▲	546 (3.0)	0 (1.0)	541 (2.9)	-5 (1.4) ▼
² Romania	542 (4.8)	538 (4.7)	-4 (1.6) ▼	542 (5.0)	0 (1.3)	543 (5.2)	1 (2.1)
[†] Netherlands	537 (2.0)	540 (2.6)	3 (1.7)	536 (2.2)	-1 (0.9)	537 (2.3)	0 (1.5)
Latvia	534 (2.8)	534 (2.7)	0 (1.5)	534 (2.8)	0 (1.3)	534 (3.0)	-1 (1.8)
² Norway (5)	531 (2.0)	525 (2.5)	-5 (1.6) ▼	531 (2.0)	1 (1.1)	534 (2.2)	4 (1.4) ▲
² Czech Republic	530 (2.2)	534 (2.6)	4 (1.2) ▲	528 (2.2)	-2 (1.0)	528 (2.5)	-3 (0.8) ▼
² Sweden	530 (2.8)	525 (2.6)	-5 (1.3) ▼	530 (2.6)	0 (1.2)	533 (2.8)	3 (1.2)
Bulgaria	530 (3.6)	528 (3.6)	-2 (1.5)	532 (3.7)	2 (1.1)	522 (4.6)	-8 (1.6) ▼
Finland	529 (2.5)	538 (2.7)	9 (1.2) ▲	525 (2.6)	-4 (1.1) ▼	528 (3.0)	-1 (1.5)
Australia	525 (2.6)	529 (3.0)	4 (1.3) ▲	523 (2.5)	-2 (0.7) ▼	526 (2.9)	2 (1.5)
Germany	524 (2.1)	532 (2.7)	9 (1.8) ▲	519 (2.5)	-5 (1.4) ▼	524 (2.4)	0 (1.3)
[†] Denmark	524 (2.1)	521 (2.2)	-3 (0.7) ▼	523 (2.5)	-1 (1.6)	525 (2.5)	1 (1.3)
² Serbia	523 (3.4)	522 (3.3)	-1 (1.6)	522 (3.4)	-1 (1.5)	523 (3.4)	0 (1.0)
² Belgium (Flemish)	521 (2.4)	534 (2.9)	13 (1.4) ▲	517 (2.4)	-4 (0.8) ▼	516 (2.8)	-4 (1.3) ▼
Hungary	520 (3.6)	527 (3.5)	7 (1.5) ▲	515 (3.5)	-5 (0.9) ▼	521 (3.4)	0 (1.0)
Portugal	517 (2.8)	517 (2.8)	0 (1.1)	516 (2.9)	-1 (0.8)	518 (2.8)	1 (1.0)
² United States	517 (3.1)	521 (3.4)	4 (1.5)	517 (3.2)	0 (0.8)	513 (3.2)	-4 (1.3) ▼
² Cyprus	516 (2.5)	519 (2.4)	2 (1.3)	514 (2.6)	-2 (1.0)	515 (2.5)	-1 (1.1)
Slovak Republic	515 (3.1)	513 (3.3)	-2 (2.0)	514 (3.2)	-1 (1.8)	518 (3.1)	3 (2.2)
Slovenia	514 (1.8)	516 (2.0)	2 (1.5)	514 (1.8)	1 (1.3)	509 (2.0)	-4 (1.4) ▼
² Italy	513 (2.8)	511 (2.9)	-3 (1.0) ▼	513 (2.9)	0 (1.4)	513 (2.7)	0 (1.3)
² Armenia	513 (2.8)	507 (2.8)	-6 (1.8) ▼	515 (2.9)	2 (1.3)	509 (2.8)	-4 (1.6)
² Albania	512 (4.9)	509 (5.7)	-2 (3.0)	514 (5.4)	2 (1.5)	508 (5.2)	-3 (2.3)
^{1,3} Canada	504 (2.0)	502 (2.1)	-2 (0.6) ▼	504 (2.0)	0 (0.6)	504 (2.2)	0 (0.9)
² Spain	498 (2.1)	500 (2.7)	1 (1.6)	497 (1.9)	-1 (0.8)	500 (2.2)	1 (1.1)
United Arab Emirates	498 (1.2)	497 (1.3)	-1 (0.5)	497 (1.2)	-1 (0.4) ▼	501 (1.2)	3 (0.7) ▲
¹ Georgia	498 (3.1)	491 (3.4)	-6 (1.5) ▼	501 (3.2)	3 (1.2) ▲	496 (3.1)	-2 (1.3)
Azerbaijan	494 (3.5)	492 (3.4)	-2 (1.3)	496 (3.4)	2 (1.3)	490 (3.6)	-5 (1.4) ▼
² New Zealand	490 (2.6)	488 (2.8)	-2 (1.5)	489 (2.5)	-2 (1.3)	495 (2.4)	5 (1.9)
² Belgium (French)	489 (2.4)	496 (2.6)	6 (1.1) ▲	489 (2.8)	-1 (1.5)	484 (2.6)	-6 (1.1) ▼
² Kazakhstan	487 (3.6)	479 (3.3)	-9 (0.9) ▼	490 (3.5)	3 (0.9) ▲	488 (3.5)	1 (1.9)
² France	484 (2.9)	484 (3.4)	0 (2.6)	484 (3.1)	0 (1.3)	482 (2.9)	-2 (1.4)
² Montenegro	477 (2.1)	474 (2.0)	-3 (1.2) ▼	478 (2.1)	1 (1.2)	474 (2.3)	-3 (1.6)
North Macedonia	474 (3.6)	472 (3.2)	-2 (1.5)	473 (3.3)	0 (2.0)	470 (3.4)	-3 (2.0)
Qatar	464 (3.5)	464 (3.4)	0 (1.4)	462 (3.5)	-2 (1.5)	466 (3.4)	2 (1.4)
Bahrain	462 (4.1)	459 (4.3)	-2 (1.9)	460 (4.2)	-1 (1.2)	469 (4.0)	8 (1.5) ▲
² Kosovo	451 (3.4)	453 (3.4)	2 (1.8)	450 (3.4)	-1 (1.4)	447 (3.5)	-4 (1.1) ▼
[†] Bosnia & Herzegovina	447 (3.2)	448 (3.4)	1 (1.4)	447 (3.5)	0 (1.3)	444 (4.0)	-3 (2.6)
² Chile	444 (2.8)	433 (2.8)	-10 (1.0) ▼	444 (2.4)	1 (1.4)	453 (3.1)	9 (1.8) ▲
Uzbekistan	443 (3.2)	441 (3.1)	-3 (1.2)	448 (3.2)	4 (1.4) ▲	428 (4.0)	-15 (1.7) ▼
Jordan	427 (5.3)	422 (5.4)	-5 (1.6) ▼	426 (5.5)	-1 (1.6)	434 (5.2)	7 (2.0) ▲
Oman	421 (4.0)	408 (4.3)	-14 (0.9) ▼	428 (4.1)	6 (1.1) ▲	428 (4.0)	7 (1.2) ▲
⁹ Iran, Islamic Rep. of	420 (4.2)	417 (3.8)	-2 (1.2)	425 (4.3)	5 (0.9) ▲	399 (4.6)	-20 (1.6) ▼
³ Saudi Arabia	420 (4.2)	417 (4.1)	-3 (1.5)	415 (4.2)	-4 (1.5) ▼	431 (4.0)	11 (1.9) ▲
Morocco	393 (4.6)	390 (5.0)	-3 (1.7)	400 (4.4)	7 (1.2) ▲	383 (5.1)	-11 (2.1) ▼
Kuwait	382 (4.4)	379 (4.6)	-3 (1.3)	379 (4.5)	-3 (1.9)	391 (4.9)	9 (3.1) ▲
South Africa (5)	362 (3.5)	357 (3.8)	-5 (1.2) ▼	366 (3.5)	5 (1.2) ▲	363 (3.7)	2 (1.9)
² Brazil	400 (3.4)	--	--	--	--	--	--
Benchmarking Participants							
Dubai, UAE	557 (1.6)	557 (1.4)	0 (0.7)	556 (1.6)	0 (0.8)	558 (1.8)	1 (1.8)
² Quebec, Canada	515 (2.7)	520 (2.8)	5 (1.4) ▲	516 (2.7)	1 (0.9)	505 (2.9)	-10 (1.3) ▼
Sharjah, UAE	504 (3.3)	503 (3.4)	-1 (1.1)	503 (3.4)	-1 (1.1)	506 (3.3)	2 (1.3)
³ Ontario, Canada	503 (3.4)	498 (3.7)	-5 (1.2) ▼	504 (3.5)	1 (1.2)	506 (3.6)	3 (1.2)
Abu Dhabi, UAE	459 (1.9)	458 (2.1)	-1 (1.1)	457 (2.0)	-2 (1.2)	463 (1.8)	5 (1.0) ▲

▲ ▼ Subscale score significantly different from overall score ($p < 0.01$)

Numbers of items are based on the TIMSS 2023 fourth-grade mathematics items included in scaling.

() Standard errors appear in parentheses. Because of rounding some results may appear inconsistent.

See Appendix B.2 for population coverage notes 1, 2, and 3. See Appendix B.5 for sampling guidelines and sampling participation notes †, ‡, and Ξ.

Ψ Reservations about reliability because the percentage of students with achievement too low for estimation exceeds 15% but does not exceed 25%.

A dash (-) indicates comparable data not available because average achievement could not be accurately estimated.

SOURCE: IEA's Trends in International Mathematics and Science Study - TIMSS 2023
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Grade 8 Mathematics Achievement Distributions

Average Mathematics Achievement and Scale Score Distributions (Grade 8)

The TIMSS 2023 eighth-grade mathematics assessment was delivered fully digitally and was based on a comprehensive [assessment framework](#) developed collaboratively with the participating countries to reflect their curricular goals. The eighth-grade mathematics assessment included four content areas—number (30%), algebra (30%), geometry and measurement (20%), and data and probability (20%). The framework prescribed that the mathematics items assessed eighth-grade students in the three cognitive domains knowing (35%), applying (40%), and reasoning (25%). To cover the framework at the eighth grade, the assessment comprised 204 items distributed across 14 item blocks with an average of 14-15 items per block.

The 2023 cycle marked the full transition to a computer-based assessment system, incorporating an [adaptive booklet rotation](#) to balance the proportion of more and less difficult booklets for countries with very high or very low expected average achievement. The 2023 assessment was carefully designed using a balanced incomplete block design, adhering to industry standards, and analyzed with state-of-the-art psychometric models. Consequently, the TIMSS 2023 mathematics achievement results for all 44 countries and 3 benchmarking participants are reported on the same TIMSS eighth-grade mathematics scale. The TIMSS eighth-grade mathematics achievement scale was established in TIMSS 1995, based on the combined distribution of achievement data across all participating countries, treating each country equally. A centerpoint of 500 was set in 1995 to correspond to the mean of overall achievement, with 100 points set to correspond to the standard deviation. Students' achievement is placed on the scale with each subsequent TIMSS cycle, most recently for TIMSS 2023.

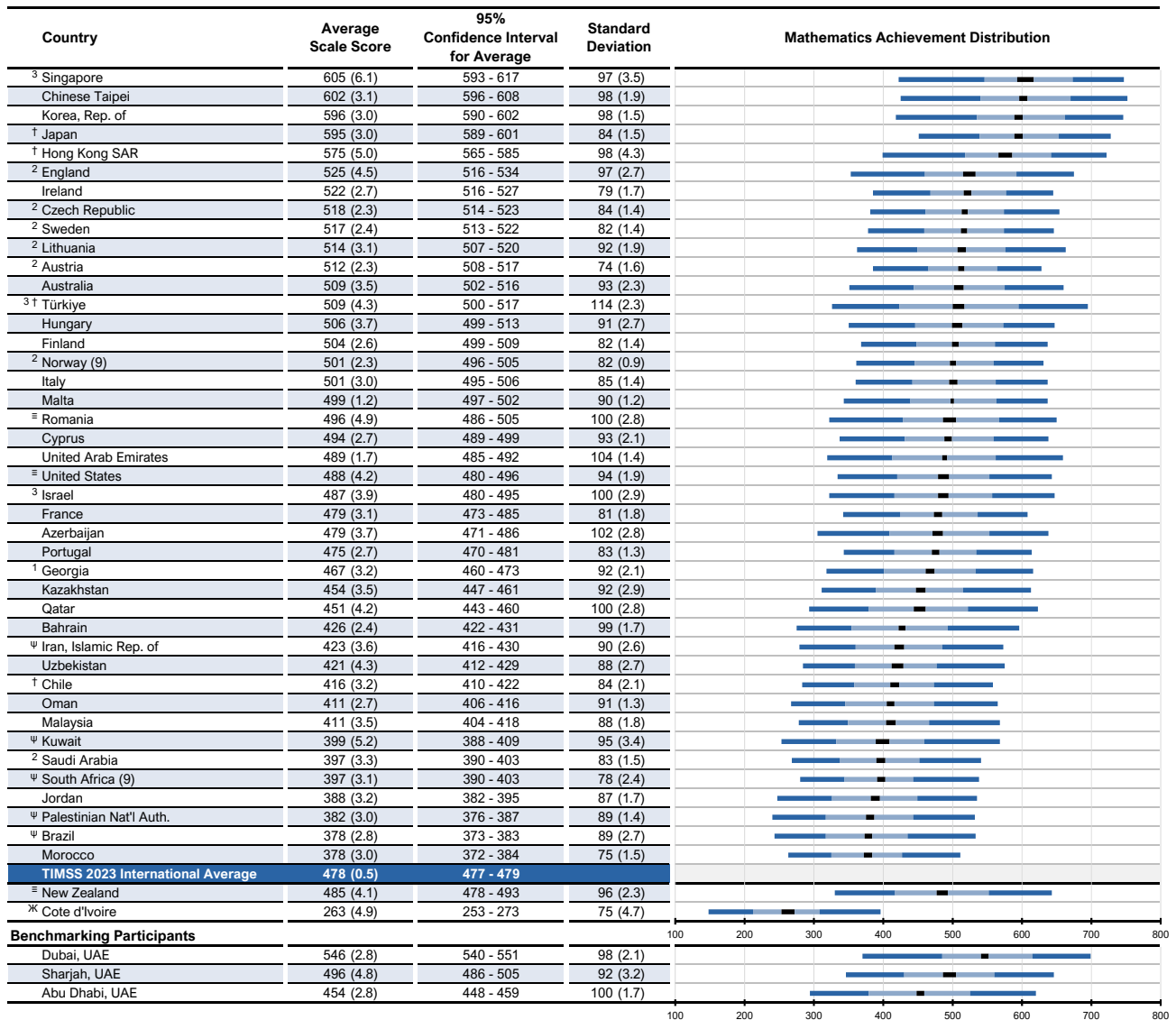
Exhibit 1.2.1 reports the average mathematics achievement estimates at the eighth grade for each of the 44 TIMSS 2023 participating countries and 3 benchmarking entities. The exhibit also presents the corresponding confidence intervals, and standard deviations for each country, together with the associated standard errors for these estimates (given in parentheses). Additionally, it includes a visualization of the score distribution, illustrating percentiles of the distribution and the confidence interval of the average achievement. The exhibit includes an international average estimate of the mean and confidence interval based on the 42 countries that participated in TIMSS 2023 with comparable data, with each country contributing equally. The standard error of this estimate reflects the estimated variance of the international average based on these countries. New Zealand and Côte d'Ivoire are reported at the bottom of the table below a line and do not contribute to the international average in eighth-grade achievement exhibits. New Zealand did not meet minimum standards for school participation rates and Côte d'Ivoire's achievement could not be reliably estimated.

The exhibit is interactive and can be sorted by different criteria, with average achievement used as the default. Sorted by average achievement, the exhibit shows that the countries with the highest estimated average achievement are Singapore, Chinese Taipei, Korea, and Japan. These countries showed notably high average achievement. For example, Korea has an estimated average achievement of 596 and a 95% confidence interval ranging from 590 to 602. The confidence interval provides a score range around the estimated mean that illustrates the uncertainty in this estimate, which is based on a sample of students in a selection or subset of classrooms within a sample of schools in each country. Intervals constructed in this way around an estimate of the mean have a 95% chance of including the actual average of the country's achievement.

There is considerable variability in achievement not only across the participants, but also within each country, as indicated by the standard deviation, the interquartile range, and the difference between the 10th and 90th percentiles of the achievement distribution shown in the table. Therefore, it would be incorrect to assume that (all) students in any country achieve higher scores than students in another country. While the average achievement of one country may be higher than the average achievement in another country, each country has some lower-achieving students and some higher-achieving students.

While examining the average achievement across countries can provide an overall initial impression of achievement in participating countries, the data collected by TIMSS 2023 and reported here is more comprehensive. TIMSS also provides information about the range of achievement observed in each country, and in later sections, about associations with contextual factors, which provides a deeper understanding of student performance relative to student background.

Exhibit 1.2.1: Average Mathematics Achievement and Scale Score Distributions



The TIMSS achievement scale was established in 1995 based on the combined achievement distribution of all countries that participated in TIMSS 1995. To provide a point of reference for country comparisons, the scale centerpoint of 500 was located at the mean of the combined achievement distribution. The units of the scale were chosen so that 100 scale score points corresponded to the standard deviation of the combined achievement distribution.

() Standard errors appear in parentheses. Because of rounding some results may appear inconsistent.

See Appendix B.7 for population coverage notes 1, 2, and 3. See Appendix B.10 for sampling guidelines and sampling participation notes †, ‡, and ≡.

≡ Reservations about reliability because the percentage of students with achievement too low for estimation exceeds 15% but does not exceed 25%.

✕ Average achievement not reliably measured because the percentage of students with achievement too low for estimation exceeds 25%.

New Zealand did not satisfy guidelines for minimum school participation rates. Achievement could not be reliably estimated for Cote d'Ivoire.

Average Mathematics Achievement for Girls and Boys (Grade 8)

Exhibit 1.2.2 shows the differences in average mathematics achievement between eighth-grade girls and boys in the 44 countries and 3 benchmarking participants, along with the average achievement for each of these groups, together with their associated standard errors (given in parentheses). Countries are sorted by default according to the size of the achievement difference between boys and girls, where negative differences indicate girls' average achievement is higher than boys, and positive differences indicate boys had a higher average than girls. In TIMSS 2023, a range of differences can be observed across countries. Across the 42 countries with internationally comparable data, most countries (21), boys showed higher average achievement than girls, with four countries exhibiting an advantage for girls. The remaining 17 countries did not have average achievement differences statistically different from 0. It can be observed that differences of about 10 points or more tend to be flagged as statistically significant with an alpha level of 0.05. In contrast, smaller differences tend not to be flagged as significantly different from 0, unless their standard error (given in parentheses) is unusually small. Statistical significance does not necessarily imply that a difference is practically meaningful and achievement differences between girls and boys should always be considered in broader educational contexts within countries.

Exhibit 1.2.2: Average Mathematics Achievement for Girls and Boys

Country	Girls		Boys		Difference	Difference	
	Percent of Students	Average Scale Score	Percent of Students	Average Scale Score		Girls Scored Higher	Boys Scored Higher
^ψ Palestinian Nat'l Auth.	49 (2.7)	391 (4.1)	51 (2.7)	372 (4.2)	-19 (5.8)		
Oman	48 (0.8)	418 (3.2)	52 (0.8)	404 (3.7)	-15 (4.3)		
Jordan	48 (2.1)	394 (4.1)	52 (2.1)	383 (5.3)	-11 (7.1)		
Bahrain	49 (0.8)	431 (2.7)	51 (0.8)	422 (3.7)	-9 (4.3)		
^ψ South Africa (9)	51 (0.8)	401 (3.6)	49 (0.8)	393 (3.4)	-8 (2.9)		
Chinese Taipei	48 (0.8)	605 (3.4)	52 (0.8)	600 (3.8)	-4 (3.7)		
² Saudi Arabia	48 (0.5)	399 (4.3)	52 (0.5)	395 (4.6)	-4 (6.0)		
Azerbaijan	48 (0.8)	480 (3.9)	52 (0.8)	478 (4.4)	-2 (3.8)		
^{3†} Türkiye	51 (1.7)	509 (4.5)	49 (1.7)	508 (5.8)	-2 (5.8)		
Malaysia	52 (1.1)	411 (3.7)	48 (1.1)	410 (3.9)	-1 (3.1)		
^ψ Iran, Islamic Rep. of	49 (1.4)	423 (5.5)	51 (1.4)	423 (5.2)	0 (8.0)		
² Norway (9)	47 (0.7)	500 (2.7)	53 (0.7)	501 (2.6)	1 (2.8)		
Finland	49 (0.9)	503 (2.8)	51 (0.9)	505 (3.0)	2 (2.7)		
³ Romania	48 (1.1)	495 (5.4)	52 (1.1)	496 (5.3)	2 (4.5)		
^ψ Kuwait	49 (1.4)	398 (5.5)	51 (1.4)	400 (8.2)	2 (9.3)		
Kazakhstan	47 (0.8)	452 (4.0)	53 (0.8)	456 (3.6)	4 (2.7)		
Cyprus	49 (0.7)	491 (3.2)	51 (0.7)	496 (3.2)	5 (3.4)		
Korea, Rep. of	49 (1.0)	593 (3.6)	51 (1.0)	599 (3.5)	6 (3.5)		
Malta	50 (0.7)	496 (1.9)	50 (0.7)	502 (2.0)	6 (3.1)		
³ Singapore	48 (2.3)	602 (6.9)	52 (2.3)	608 (8.3)	7 (9.4)		
² Austria	49 (1.0)	509 (2.4)	51 (1.0)	515 (2.8)	7 (2.6)		
² Sweden	49 (0.7)	514 (2.8)	51 (0.7)	521 (2.8)	7 (2.7)		
Morocco	50 (0.6)	374 (3.4)	50 (0.6)	381 (3.1)	7 (2.4)		
² Lithuania	50 (0.8)	510 (3.1)	50 (0.8)	517 (3.9)	7 (3.2)		
Qatar	48 (2.1)	448 (4.9)	52 (2.1)	455 (5.9)	7 (6.8)		
[†] Hong Kong SAR	49 (1.6)	571 (5.5)	51 (1.6)	578 (6.4)	7 (6.3)		
[†] Georgia	49 (0.8)	463 (3.5)	51 (0.8)	471 (3.9)	8 (3.6)		
Uzbekistan	50 (0.9)	416 (3.7)	50 (0.9)	426 (5.8)	11 (4.7)		
France	50 (0.7)	473 (3.5)	50 (0.7)	484 (3.4)	12 (2.8)		
United Arab Emirates	49 (0.4)	482 (1.9)	51 (0.4)	495 (2.2)	13 (2.2)		
Australia	47 (1.7)	502 (4.2)	53 (1.7)	515 (4.3)	13 (5.0)		
[†] Japan	49 (1.3)	588 (3.4)	51 (1.3)	601 (3.5)	14 (3.5)		
Ireland	47 (1.6)	514 (3.5)	53 (1.6)	528 (3.0)	14 (3.5)		
³ United States	49 (0.7)	481 (4.3)	51 (0.7)	495 (4.4)	14 (2.6)		
Portugal	49 (1.0)	468 (3.4)	51 (1.0)	482 (2.9)	14 (3.3)		
³ Israel	50 (1.0)	480 (4.2)	50 (1.0)	495 (4.6)	15 (4.5)		
Hungary	50 (1.0)	498 (3.8)	50 (1.0)	514 (4.6)	16 (4.0)		
Italy	49 (0.7)	492 (3.4)	51 (0.7)	509 (3.3)	16 (3.0)		
² Czech Republic	48 (0.7)	508 (2.5)	52 (0.7)	528 (2.6)	19 (2.4)		
^ψ Brazil	50 (0.5)	368 (2.8)	50 (0.5)	388 (3.2)	21 (2.4)		
[†] Chile	49 (1.1)	405 (3.5)	51 (1.1)	427 (3.7)	22 (3.2)		
² England	50 (2.0)	512 (5.0)	50 (2.0)	538 (5.9)	26 (6.5)		
International Average	49 (0.2)	475 (0.6)	51 (0.2)	481 (0.7)	6 (0.7)		
[✕] Cote d'Ivoire	49 (1.4)	258 (8.7)	51 (1.4)	268 (3.7)	10 (8.7)		
New Zealand	46 (1.7)	473 (5.2)	54 (1.7)	496 (5.8)	23 (7.5)		
Benchmarking Participants							
Abu Dhabi, UAE	50 (0.5)	450 (3.3)	50 (0.5)	458 (3.5)	8 (3.9)		
Sharjah, UAE	50 (0.8)	491 (5.3)	50 (0.8)	500 (5.3)	9 (4.7)		
Dubai, UAE	48 (0.7)	534 (3.4)	52 (0.7)	557 (3.8)	23 (4.6)		

Students' gender information was obtained from school tracking data.

() Standard errors appear in parentheses. Because of rounding some results may appear inconsistent.

See Appendix B.7 for population coverage notes 1, 2, and 3. See Appendix B.10 for sampling guidelines and sampling participation notes †, ‡, and Ξ.

Ψ Reservations about reliability because the percentage of students with achievement too low for estimation exceeds 15% but does not exceed 25%.

✕ Average achievement not reliably measured because the percentage of students with achievement too low for estimation exceeds 25%.

New Zealand did not satisfy guidelines for minimum school participation rates. Achievement could not be reliably estimated for Cote d'Ivoire.

■ Difference statistically significant ($p < 0.05$)

■ Difference not statistically significant

SOURCE: IEA's Trends in International Mathematics and Science Study - TIMSS 2023
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Grade 8 International Benchmarks of Mathematics Achievement

International Benchmarks of Grade 8 Mathematics Achievement

To understand what students at different points on the TIMSS achievement scale know and can do, it is important to examine the types of tasks students at certain defined points on the TIMSS achievement scale are likely to solve. For example, in terms of students' mathematics skills, if a group of students has an average achievement of 550, what do these students know, and what can they do, compared to students with an average achievement of 400? Looking at the proportion of students who can solve the TIMSS mathematics items can help countries determine whether students at different levels along the scale have gained the mathematics knowledge and skills covered in the mathematics curriculum.

To provide more information about the range of achievement students show in the TIMSS eighth grade mathematics assessment, TIMSS reports percentages of students reaching four increasingly challenging points along the achievement scale, known as International Benchmarks: Low International Benchmark (400 scale score points), Intermediate International Benchmark (475), High International Benchmark (550), and Advanced International Benchmark (625). The TIMSS International Benchmarks build on each other, representing increasingly demanding mathematics knowledge and skills with each higher benchmark. The students who reach a higher benchmark have also surpassed all lower benchmarks. For example, students who reached the Advanced Benchmark also surpassed the High, Intermediate, and Low Benchmarks.

Descriptions for each International Benchmark provide an interpretation of the achievement scale in relation to students' performance on the assessment items. For TIMSS 2023, the descriptions of mathematics achievement at the International Benchmarks were updated from TIMSS 2019 based on a review and analysis of the items that students with average achievement at or above each of the benchmarks were likely to solve in TIMSS 2023 (see Chapter 14 in the *TIMSS 2023 Technical Report*).

Exhibit 1.2.3: Summary of TIMSS 2023 International Benchmarks of Mathematics Achievement

	Advanced International Benchmark
625	<i>Students can extend their understanding beyond working with integers alone to solve a variety of problems in novel contexts. They can interpret relationships among fractions or decimals, negative numbers, or proportions and ratios in multistep problems. They can formulate expressions, solve algebraic equations, and demonstrate an understanding of linear functions. Students can use their knowledge of the properties of geometric figures to find missing measures and identify related shapes. Students can integrate information across data displays to represent data and justify a conclusion. Students can implement their understanding of probabilities to relate problem conditions and likelihood.</i>
	High International Benchmark
550	<i>Students can apply their conceptual understanding in a variety of relatively complex situations. They can relate magnitudes and differences between positive and negative integers, fractions, and decimals to solve problems. Students demonstrate an understanding of linear equations and can formulate algebraic expressions to represent a problem. They demonstrate a basic understanding of relationships represented as graphs on a Cartesian plane. They can apply basic properties of shapes to solve problems involving triangles, parallel lines, rectangles, and similar figures. Students can interpret data given in a variety of graphical representations to justify conclusions and solve problems involving outcomes and probabilities in familiar contexts.</i>
	Intermediate International Benchmark
475	<i>Students can apply mathematical knowledge in a variety of situations. They can solve problems across contexts involving whole numbers, negative numbers, fractions, decimals, and proportional relationships. They can interpret relationships given visually or in words to represent them algebraically. Students demonstrate some understanding of angle measures and in relating two-dimensional and three-dimensional shapes. They can read, interpret, and integrate across sources to represent data.</i>
	Low International Benchmark
400	<i>Students have knowledge of integers, basic shapes, and visual representations. Students can apply basic properties of whole numbers. They demonstrate some knowledge of linear relationships. They can find the lengths of sides in polygons and relate views of solids. Students can read information from graphs and complete data representations.</i>

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Exhibit 1.2.5: Description of the TIMSS 2023 Low International Benchmark (400) of Mathematics Achievement



Low International Benchmark

400 Summary

Students have knowledge of integers, basic shapes, and visual representations. Students can apply basic properties of whole numbers. They demonstrate some knowledge of linear relationships. They can find the lengths of sides in polygons and relate views of solids. Students can read information from graphs and complete data representations.

Students can relate number properties of integers up to six digits to solve problems, including when given in words. They can order negative numbers and arrange integers in an equation to produce a given product.

Students can identify the line on a grid that represents the greatest increase.

Students can use properties of shapes and measures in polygons to determine the side length of a regular polygon given its perimeter or to identify corresponding angles in rotated polygons. Students can also interpret different views representing a given three-dimensional solid.

Students can interpret data from several representations, including interpolating values in a line graph, labeling the portions of a pie chart, and completing a line graph from data in a table.

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Exhibit 1.2.6: Description of the TIMSS 2023 Intermediate International Benchmark (475) of Mathematics Achievement



Intermediate International Benchmark

475 Summary

Students can apply mathematical knowledge in a variety of situations. They can solve problems across contexts involving whole numbers, negative numbers, fractions, decimals, and proportional relationships. They can interpret relationships given visually or in words to represent them algebraically. Students demonstrate some understanding of angle measures and in relating two-dimensional and three-dimensional shapes. They can read, interpret, and integrate across sources to represent data.

Students can determine differences involving a negative integer to solve problems. They can identify equivalent representations of fractions. Students can relate simple fractions and decimals, including solving simple equations with negative decimals. Students can relate representations of ratios, percentages, or fractions and apply and represent a proportional relationship to solve word problems.

Students can represent situations with an expression with two variables and, when given the values to substitute, use the result of expressions to justify a conclusion. They can algebraically represent linear relationships and solve linear equations with an unknown on one side. They can order algebraic expressions involving a variable representing a positive integer, including single-term quadratic and negative terms. Students can interpret linear relationships from a line graph to find a function value and identify a simple quadratic relationship from numbers in a table.

Students can determine supplementary angle measures. They can identify two-dimensional views of a complex three-dimensional shape and relate three-dimensional shapes, including analyzing visualizations of three-dimensional shapes composed of unit cubes.

Students can read data from a table or bar graph and combine data from two sources to solve a problem. They can integrate information to label pie charts or bar graph axes satisfying proportional requirements.

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Exhibit 1.2.6a: TIMSS 2023 Intermediate International Benchmark (475) of Mathematics Achievement – Example Item 1

Content Domain: Algebra

Cognitive Domain: Reasoning

Description: Solves a word problem involving an inequality and explains answer

Eric has 50 minutes to make as many model planes as he can.
It takes Eric 5 minutes to make Model A and 3 minutes to make Model B.

A. Eric wants to make 5 of Model A and 10 of Model B.

Explain why he will **not** have enough time to complete these models.

it will take him 55 minutes

The answer shown illustrates one type of response that would receive full credit.
Other types of correct responses are possible as defined by the item's unique scoring guide.

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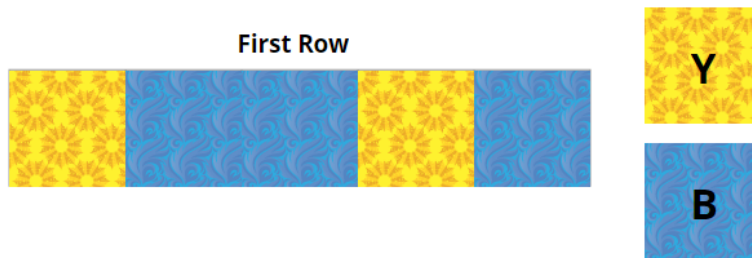
Exhibit 1.2.6b: TIMSS 2023 Intermediate International Benchmark (475) of Mathematics Achievement – Example Item 2
Content Domain: Number

Cognitive Domain: Applying

Description: Given a ratio, represents an equivalent ratio pictorially

There are 5 squares in the first row of a quilt. The ratio of yellow (Y) to blue (B) squares is equivalent to 4:6.

Drag squares to the row to show a ratio equivalent to 4:6.



The answer shown illustrates one possible arrangement of 3 blue and 2 yellow squares that would receive full credit.

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Exhibit 1.2.7: Description of the TIMSS 2023 High International Benchmark (550) of Mathematics Achievement



High International Benchmark

550 Summary

Students can apply their conceptual understanding in a variety of relatively complex situations. They can relate magnitudes and differences between positive and negative integers, fractions, and decimals to solve problems. Students demonstrate an understanding of linear equations and can formulate algebraic expressions to represent a problem. They demonstrate a basic understanding of relationships represented as graphs on a Cartesian plane. They can apply basic properties of shapes to solve problems involving triangles, parallel lines, rectangles, and similar figures. Students can interpret data given in a variety of graphical representations to justify conclusions and solve problems involving outcomes and probabilities in familiar contexts.

Students can solve problems across contexts involving number properties. They can add two numbers in exponential form and determine a number between a positive and negative number on a number line. Students demonstrate conceptual understanding of fractions to make multiple comparisons with fractions and simple decimals, relate decimals and integers on a number line, and find values to make fractions equivalent. Students can add fractions with different denominators and order them. They can apply ratios and percentages to determine a quantity, both with increases and decreases. Students can represent parts of a whole using percentages, represent sets of quantities with ratios, and identify equivalent ratios.

Students can evaluate algebraic expressions, including those with up to three variables, products of variables, or quadratic terms given the values to substitute. They can identify and formulate algebraic expressions to represent real-world situations. Students can solve linear equations and verify solutions to simultaneous linear equations. Students can analyze and verify properties of functions represented on a Cartesian plane, including representing a non-linear relationship in a graph and interpreting the intersection point of two lines in the context of a problem. They can identify similarities among numbers to generate the next term in a multiplicative pattern or extrapolate a relationship from numbers in a table.

Students can integrate properties of a two-dimensional shape to recreate it on a grid or to estimate or calculate angle measures. They can determine the coordinates of points on a Cartesian plane, translate a point, and identify reflected shapes over an axis. They can calculate the area of a parallelogram given its base and height. Students can apply properties of similar triangles to determine lengths or use properties of a right triangle, including the Pythagorean theorem, to solve a problem. They can relate properties and representations of two- and three-dimensional shapes to solve problems.

Students can integrate data from multiple representations to complete tables and graphs, including interpreting a line graph to justify a conclusion and determining the best representation to display results. Students can calculate the mean of data in a list or from a bar graph. They can determine the probability of a simple event and apply their understanding of probability to represent scenarios meeting a probability condition or estimate an empirical probability given experimental outcomes.

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Exhibit 1.2.7a: TIMSS 2023 High International Benchmark (550) of Mathematics Achievement – Example Item 1

Content Domain: Algebra

Cognitive Domain: Applying

Description: Solves a pair of simultaneous linear equations in two variables

$$3x + 4y = 13$$

$$2x - y = 5$$

Find the values of x and y that make both equations true.

$x =$

$y =$

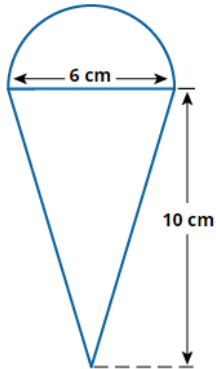
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Exhibit 1.2.7b: TIMSS 2023 High International Benchmark (550) of Mathematics Achievement – Example Item 2

Content Domain: Geometry and Measurement**Cognitive Domain:** Applying**Description:** Solves a word problem involving circles and similar triangles

- The design for an ice cream shop's logo is a semicircle on top of an isosceles triangle with the dimensions shown below.



The shop wants to make a larger version of the logo using a similar triangle with a height of 250 cm.

What will be the diameter of the semicircle for the larger version?

Answer: cm

Exhibit 1.2.8: Description of the TIMSS 2023 Advanced International Benchmark (625) of Mathematics Achievement



Advanced International Benchmark

625 Summary

Students can extend their understanding beyond working with integers alone to solve a variety of problems in novel contexts. They can interpret relationships among fractions or decimals, negative numbers, or proportions and ratios in multistep problems. They can formulate expressions, solve algebraic equations, and demonstrate an understanding of linear functions. Students can use their knowledge of the properties of geometric figures to find missing measures and identify related shapes. Students can integrate information across data displays to represent data and justify a conclusion. Students can implement their understanding of probabilities to relate problem conditions and likelihood.

Students can interpret relationships among number properties to solve a problem or justify a conclusion, including with negative numbers, decimals, and fractions. They can extend their arithmetic knowledge to algebraic representations to apply a rule involving negative numbers or decompose multiplication as a sum of products. Students can apply their understanding of computations with fractions and decimals to solve a two-step word problem. They can analyze and integrate information across different sources to support calculations with integers and relate percentages with fractions, decimals, and ratios. Students demonstrate understanding of proportional reasoning and can apply a ratio to solve a word problem or determine the ratio in the simplest form given a representation.

Students can formulate and solve equations involving fractions and evaluate an expression with one or two variables involving an exponent, fractions, or a square root. They can identify simultaneous equations representing a situation given in words. Students can represent a relationship as an algebraic inequality with up to two variables and integrate two inequalities given as a visual representation to solve a problem. Students can simplify an algebraic expression involving fractions and two variables and formulate a pattern using an algebraic expression. Students demonstrate understanding of linear relationships, including estimating the slope of the graph of a linear function and extrapolating a linear function to estimate a value.

Students can apply the properties of two-dimensional shapes, including circles, triangles, and unfamiliar polygons, to solve a variety of problems. They can relate the dimensions of these shapes and use the area of triangles, the Pythagorean theorem, and parallel lines to find missing measures of lengths and angles. They can translate shapes on the Cartesian plane and determine the number of faces in a complex three-dimensional solid. Students can integrate properties of three-dimensional figures to solve problems involving volume and surface area.

Students can integrate data from multiple representations to solve word problems. They can apply an understanding of the mean of data in a table to justify a claim. Students demonstrate a conceptual understanding of probabilities of simple events to determine conditions resulting in the greatest probability of an event or to determine the probability of a complementary event.

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Exhibit 1.2.8a: TIMSS 2023 Advanced International Benchmark (625) of Mathematics Achievement – Example Item 1**Content Domain:** Data and Probability**Cognitive Domain:** Knowing**Description:** Computes the probability of an event given the number of each type of object in a set

Jenny has a bag of marbles with:

- 50 red
- 50 yellow
- 40 blue
- 60 green

She picks one marble out of the bag at random.

A. What is the probability Jenny will pick a marble that is **not** green?

Answer:

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Exhibit 1.2.8b: TIMSS 2023 Advanced International Benchmark (625) of Mathematics Achievement – Example Item 2**Content Domain:** Number**Cognitive Domain:** Applying**Description:** Given a ratio in a table, completes two equivalent ratios with one part missing in each

The value of x is **proportional** to the value of y .

Complete the table.

x	y
6	4
3	2
12	8

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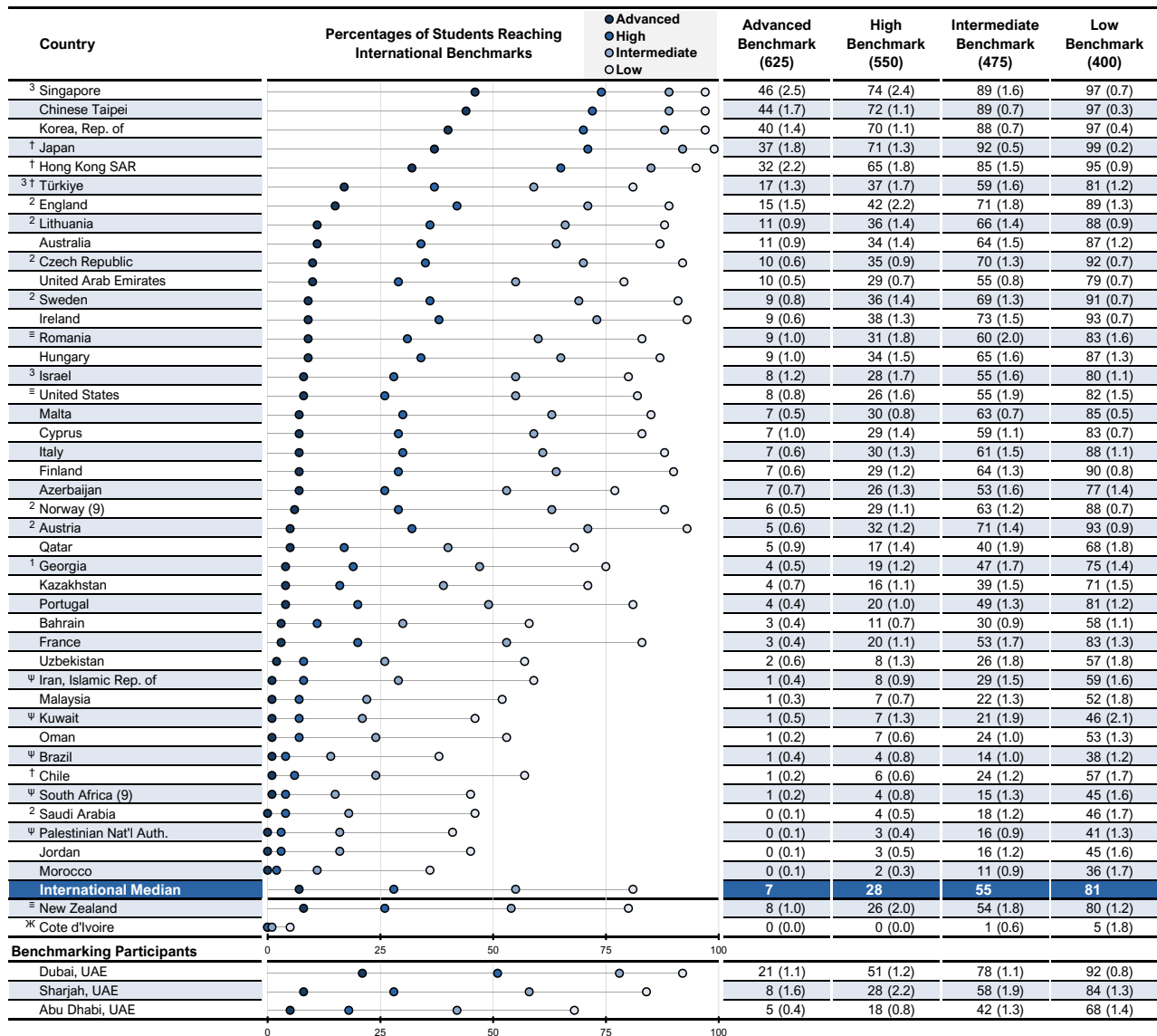
Percentages of Students Reaching International Benchmarks of Mathematics Achievement (Grade 8)

Exhibit 1.2.4 provides graphical and numerical representations of the percentages of eighth-grade students reaching each TIMSS 2023 International Benchmark in participating countries and benchmarking entities. The International Benchmarks function like steps on a ladder: If students reached a higher benchmark, they also reached each of the lower benchmarks. The percentages do not add up to 100%, but rather indicate cumulative proportions: The lower the benchmark, the higher the proportion of students reaching that benchmark. Conversely, the higher the benchmark, the lower the proportion of students reaching it. The exhibit also provides the standard error (in parentheses) associated with each of the estimated percentages.

As a point of reference, the exhibit reports the international median of the percentage of students reaching each International Benchmark across 42 participating countries with internationally comparable data, instead of an average as is displayed in other report exhibits for average achievement. By definition, half of the countries will have a percentage in the column above the median, and half will be below the median.

In TIMSS 2023, the percentage of eighth-grade students reaching the Advanced Benchmark ranged from 46 percent to 0 percent. Most countries had fewer than 10 percent of students reaching the Advanced Benchmark. Across the 42 countries, the median percentages of students reaching each International Benchmark were 7 percent at Advanced, 28 percent at High, 55 percent at Intermediate, and 81 percent at Low. The percentage of students reaching the Low Benchmark ranged from 99 percent to 36 percent. In 10 countries, 90 percent or more of the eighth-grade students internationally reached the Low Benchmark, which can be considered a level of minimum mathematics proficiency. However, there are several countries with at least 85 percent of students, but fewer than 90 percent of students, reaching the Low Benchmark. The exhibit allows sorting by percentage of students reaching each International Benchmark and selecting groups of countries, facilitating the examination of relative differences in the percentages of students reaching the different levels of proficiency described by the TIMSS 2023 International Benchmarks.

Exhibit 1.2.4: Percentages of Students Reaching the TIMSS International Benchmarks of Mathematics Achievement



() Standard errors appear in parentheses. Because of rounding some results may appear inconsistent.

See Appendix B.7 for population coverage notes 1, 2, and 3. See Appendix B.10 for sampling guidelines and sampling participation notes †, ‡, and ≡.

^ψ Reservations about reliability because the percentage of students with achievement too low for estimation exceeds 15% but does not exceed 25%.

[✱] Average achievement not reliably measured because the percentage of students with achievement too low for estimation exceeds 25%.

New Zealand did not satisfy guidelines for minimum school participation rates. Achievement could not be reliably estimated for Cote d'Ivoire.

SOURCE: IEA's Trends in International Mathematics and Science Study - TIMSS 2023
Downloaded from <https://timss2023.org/results>

Grade 8 Trends in Mathematics Achievement

Trends in Mathematics Achievement (Grade 8)

The eighth-grade TIMSS mathematics achievement scale was established in TIMSS 1995, based on the achievement data across all participating countries. In 1995, the international mean was set to 500, and the international standard deviation was set to 100, providing the origin of the TIMSS trend scale. Students' achievement was placed on the scale with each subsequent TIMSS cycle, most recently for TIMSS 2023. Reporting the achievement data from each TIMSS assessment on the TIMSS trend scale enables monitoring increases or decreases in achievement across assessment cycles.

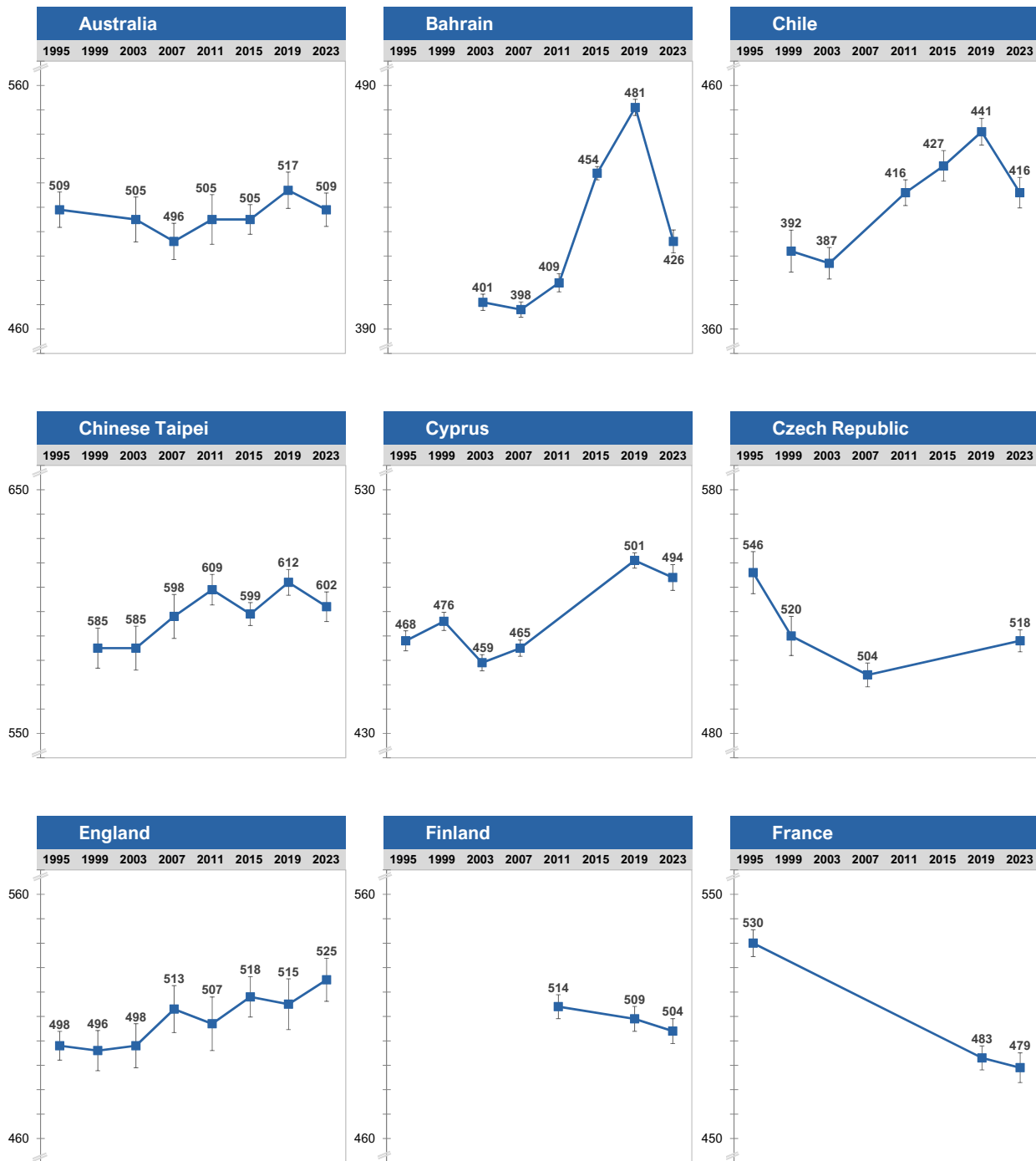
Exhibit 1.2.9 displays changes in achievement across assessment years for the countries and benchmarking participants that have participated in prior cycles of TIMSS. The trend graphs include a graphical representation of the 95% confidence interval around each cycle mean, depicted as small error bars above and below the average achievement estimate. Confidence intervals of this type have a 95% probability to include the true country average under repeated sampling. Users can select individual countries, groups of countries, or all countries that participated for customized displays of trends.

Across the (up to) 8 time points spanning the years from 1995 to 2023, many countries that participated multiple times have had some periods of increases or decreases in average achievement as well as periods of stability. It can be seen that even if estimates of average achievement may be lower or higher for adjacent years, the confidence intervals overlap quite frequently. In cases of larger differences with little or no overlap of confidence intervals, the trends over time indicate more noticeable changes of larger magnitude.

Exhibit 1.2.10 extends the results of Exhibit 1.2.9, providing more detail about the achievement distributions across assessment cycles and the differences in average achievement between each previous TIMSS cycle and TIMSS 2023. Symbols are used to indicate if an estimate obtained in a prior TIMSS cycle shows a statistically significant difference compared to TIMSS 2023. The direction of the up or down arrow shows whether the previous estimate is higher or lower than the estimate obtained in 2023. For the 34 countries with comparable data in TIMSS 2019, three countries showed an increase in average mathematics achievement in TIMSS 2023, 14 showed a decrease, and 17 had no change. Confidence intervals for the average achievement of each cycle are reported, corresponding to the error bars in the trend graphs in Exhibit 1.2.9. The graphical depiction of the percentiles provides a visualization of the distribution and shows the range of achievement that is observed in each cycle. The overlap of these visual representations of achievement distributions provides a reference for the magnitude of changes observed across TIMSS cycles.

Exhibit 1.2.9: Trend Plots of Average Mathematics Achievement

This exhibit displays changes in achievement across assessment years for the countries and benchmarking participants that have comparable data from previous TIMSS assessments. The accompanying table (Exhibit 1.2.10) provides details. The scale interval is 10 points for each country, but a different part of the scale is shown according to each country's average achievement. See Appendix A for country participation in previous assessments.



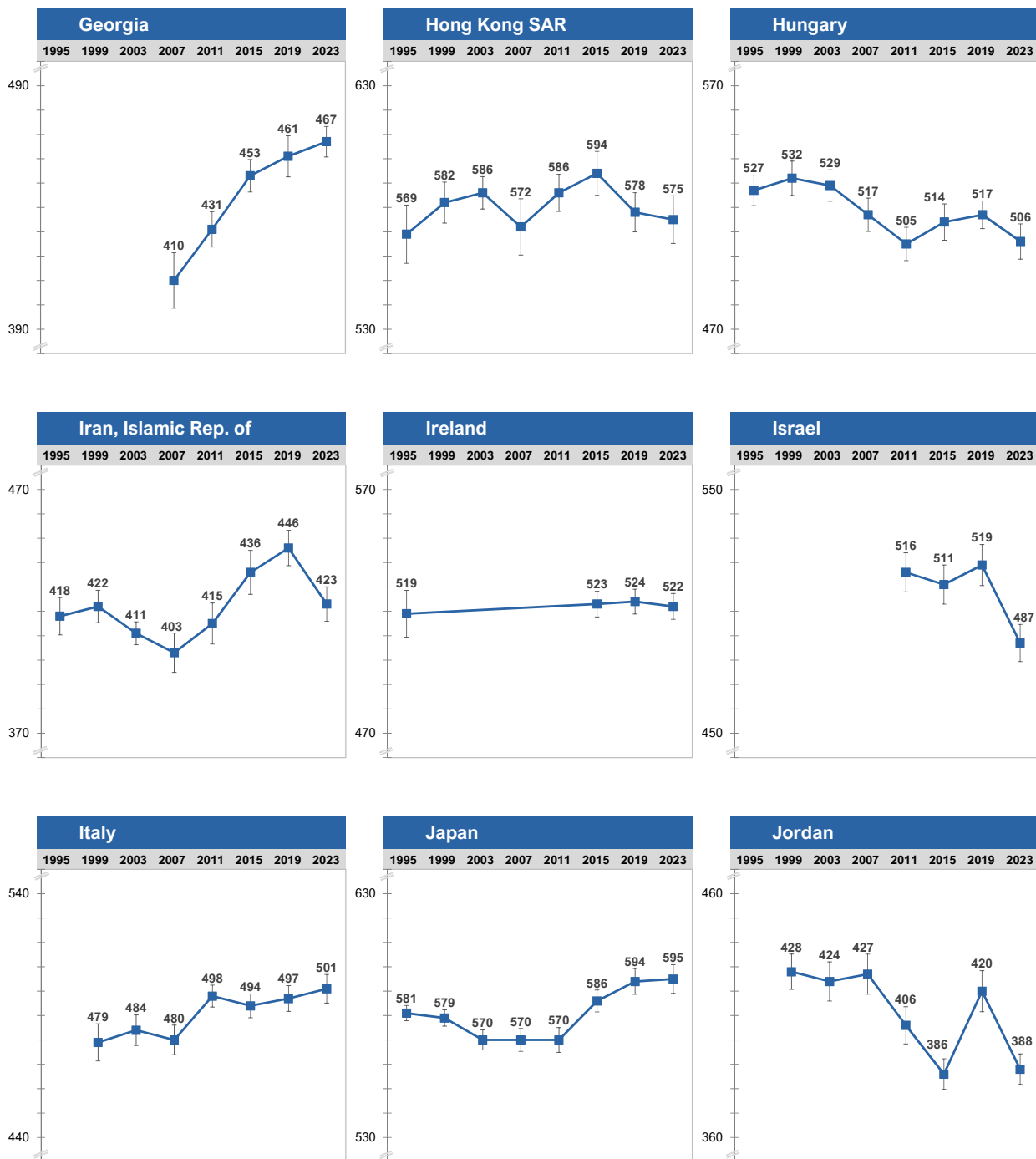
See Appendix A for country participation in previous TIMSS assessments.
The scale interval is 10 points for each country, but a different part of the scale is shown according to each country's average achievement.
I The black bars represent the 95% confidence interval.

SOURCE: IEA's Trends in International Mathematics and Science Study - TIMSS 2023
Downloaded from <https://timss2023.org/results>

Exhibit 1.2.9: Trend Plots of Average Mathematics Achievement

(Continued)

This exhibit displays changes in achievement across assessment years for the countries and benchmarking participants that have comparable data from previous TIMSS assessments. The accompanying table (Exhibit 1.2.10) provides details. The scale interval is 10 points for each country, but a different part of the scale is shown according to each country's average achievement. See Appendix A for country participation in previous assessments.



See Appendix A for country participation in previous TIMSS assessments.

The scale interval is 10 points for each country, but a different part of the scale is shown according to each country's average achievement.

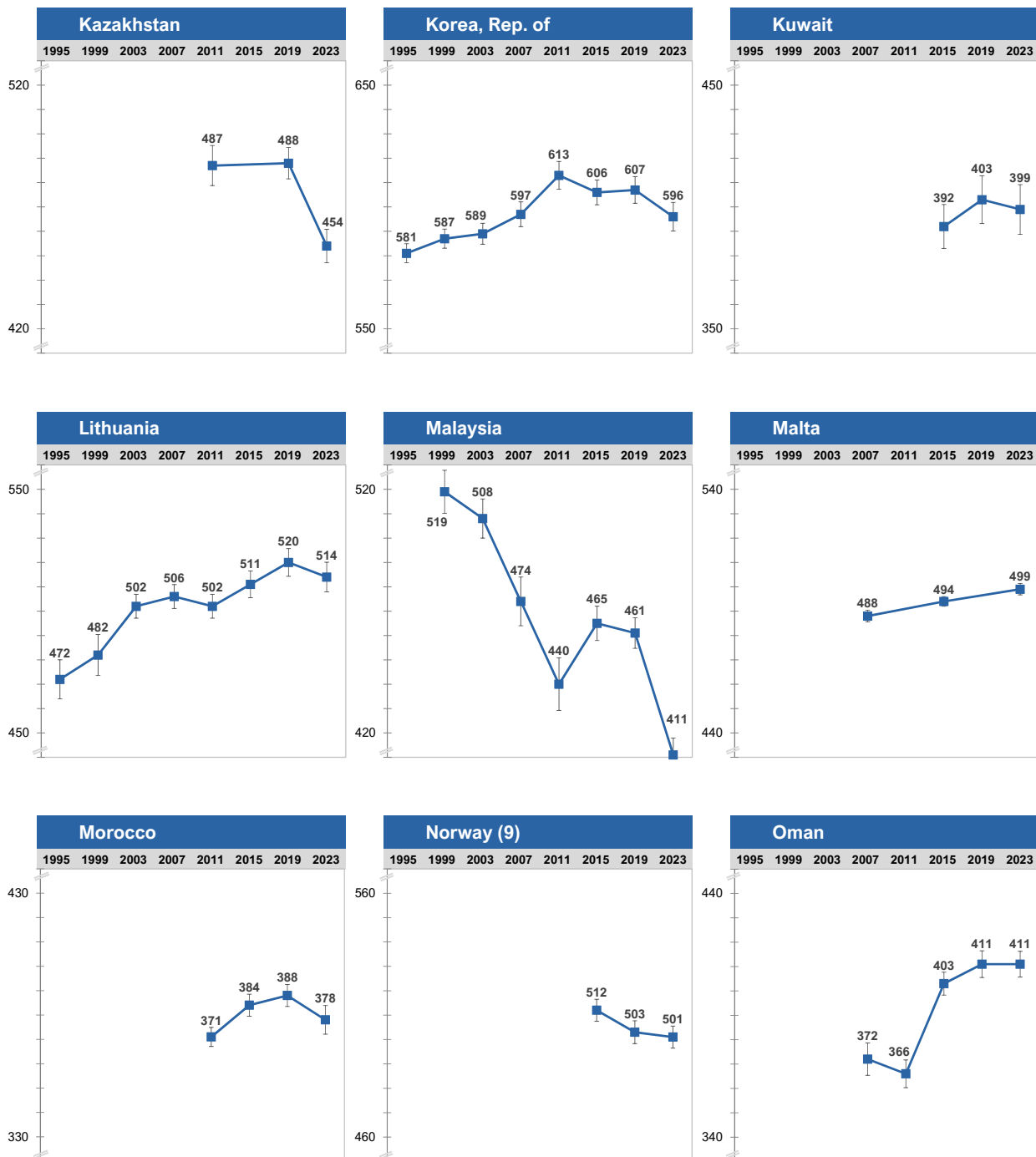
I The black bars represent the 95% confidence interval.

SOURCE: IEA's Trends in International Mathematics and Science Study - TIMSS 2023
Downloaded from <https://timss2023.org/results>

Exhibit 1.2.9: Trend Plots of Average Mathematics Achievement

(Continued)

This exhibit displays changes in achievement across assessment years for the countries and benchmarking participants that have comparable data from previous TIMSS assessments. The accompanying table (Exhibit 1.2.10) provides details. The scale interval is 10 points for each country, but a different part of the scale is shown according to each country's average achievement. See Appendix A for country participation in previous assessments.



See Appendix A for country participation in previous TIMSS assessments.

The scale interval is 10 points for each country, but a different part of the scale is shown according to each country's average achievement.

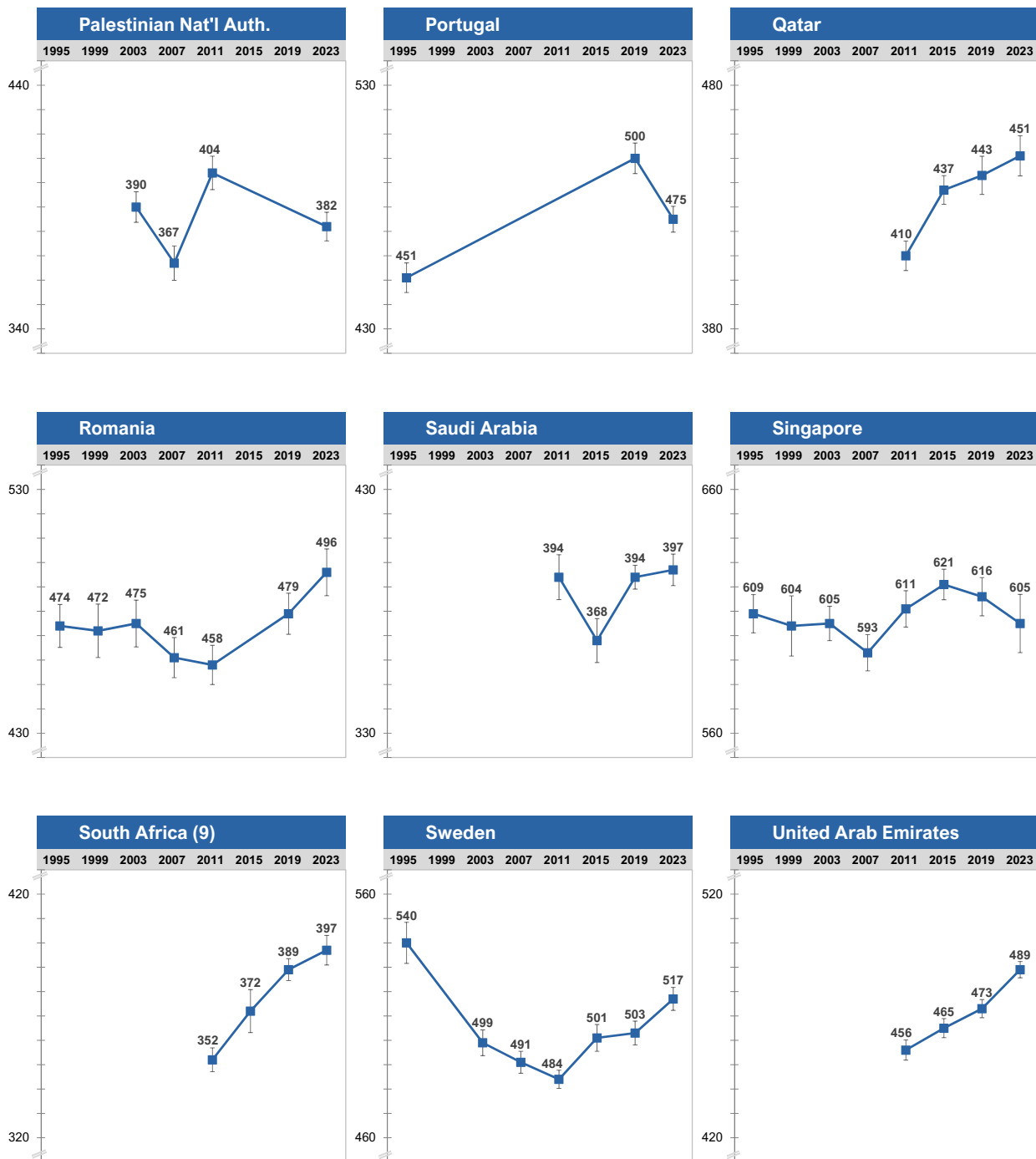
I. The black bars represent the 95% confidence interval.

SOURCE: IEA's Trends in International Mathematics and Science Study - TIMSS 2023
Downloaded from <https://timss2023.org/results>

Exhibit 1.2.9: Trend Plots of Average Mathematics Achievement

(Continued)

This exhibit displays changes in achievement across assessment years for the countries and benchmarking participants that have comparable data from previous TIMSS assessments. The accompanying table (Exhibit 1.2.10) provides details. The scale interval is 10 points for each country, but a different part of the scale is shown according to each country's average achievement. See Appendix A for country participation in previous assessments.



See Appendix A for country participation in previous TIMSS assessments.

The scale interval is 10 points for each country, but a different part of the scale is shown according to each country's average achievement.

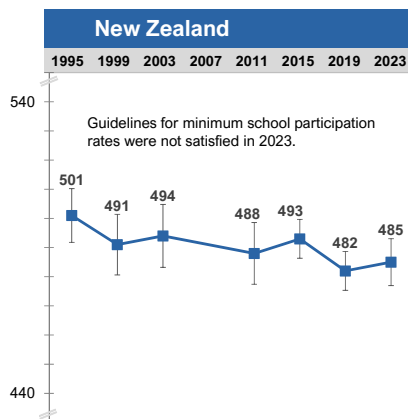
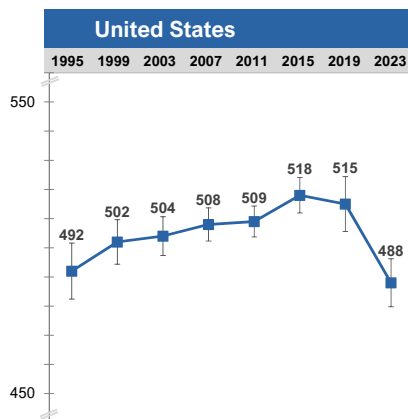
I. The black bars represent the 95% confidence interval.

SOURCE: IEA's Trends in International Mathematics and Science Study - TIMSS 2023
Downloaded from <https://timss2023.org/results>

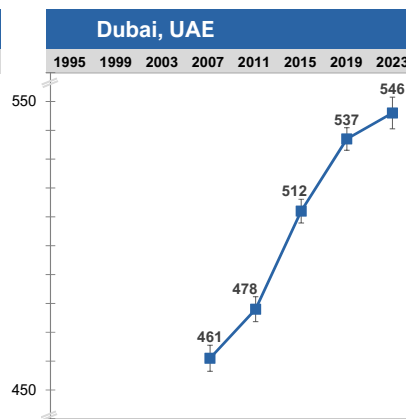
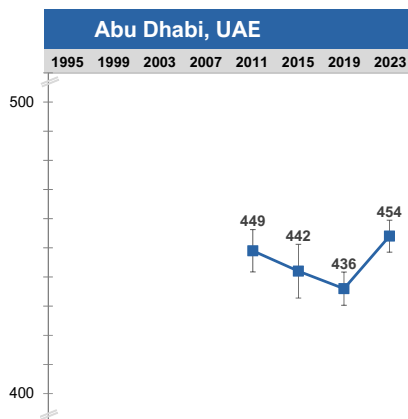
Exhibit 1.2.9: Trend Plots of Average Mathematics Achievement

(Continued)

This exhibit displays changes in achievement across assessment years for the countries and benchmarking participants that have comparable data from previous TIMSS assessments. The accompanying table (Exhibit 1.2.10) provides details. The scale interval is 10 points for each country, but a different part of the scale is shown according to each country's average achievement. See Appendix A for country participation in previous assessments.



Benchmarking Participants



See Appendix A for country participation in previous TIMSS assessments.

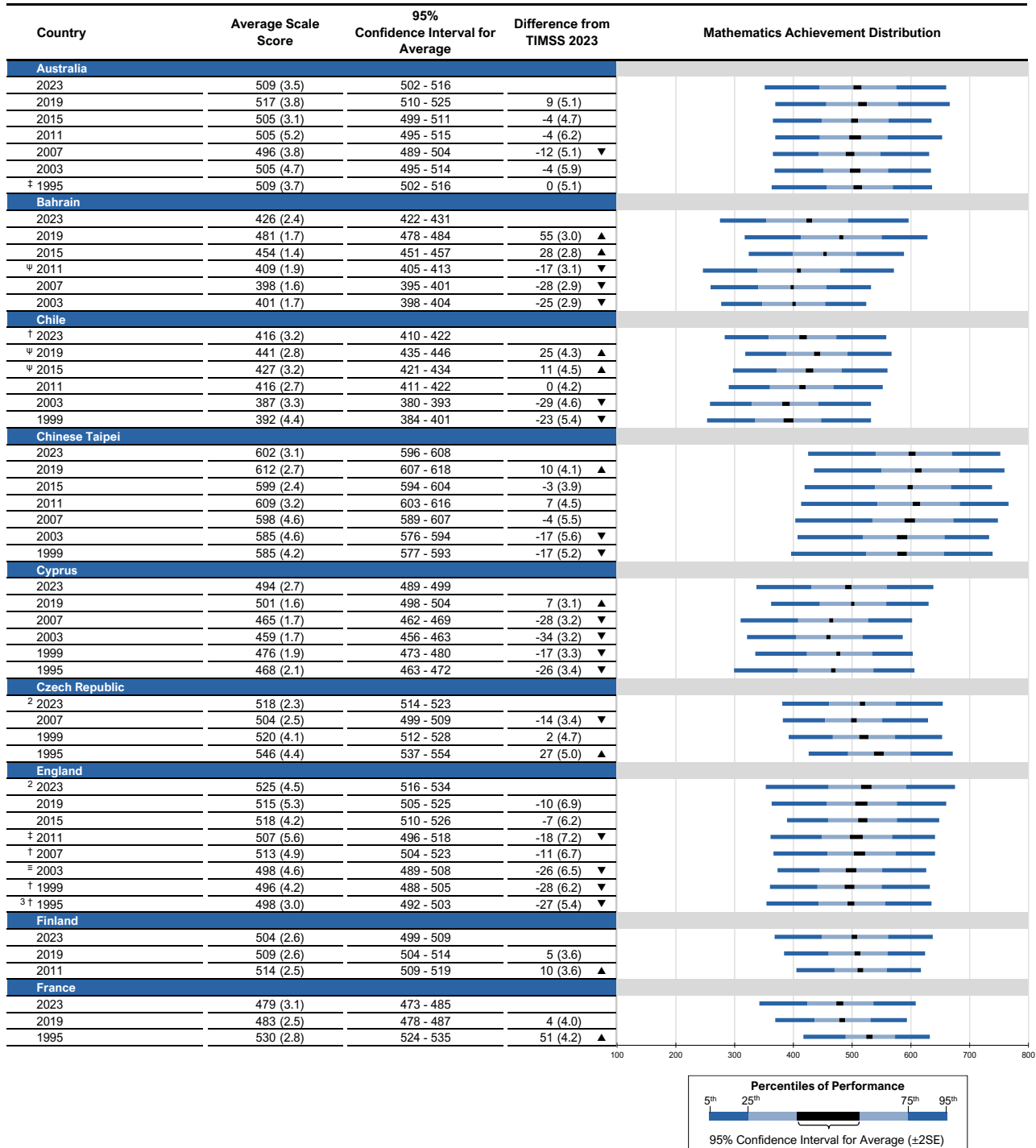
The scale interval is 10 points for each country, but a different part of the scale is shown according to each country's average achievement.

I. The black bars represent the 95% confidence interval.

SOURCE: IEA's Trends in International Mathematics and Science Study - TIMSS 2023
Downloaded from <https://timss2023.org/results>

Exhibit 1.2.10: Trends in Average Mathematics Achievement and Scale Score Distributions

This exhibit reports differences in achievement across assessment years for the countries and benchmarking participants that have comparable data from previous TIMSS assessments. Symbols indicate if the row year is significantly higher (▲) or significantly lower (▼) than the performance in TIMSS 2023. See Appendix A for country participation in previous TIMSS assessments.



See Appendix A for country participation in previous TIMSS assessments.

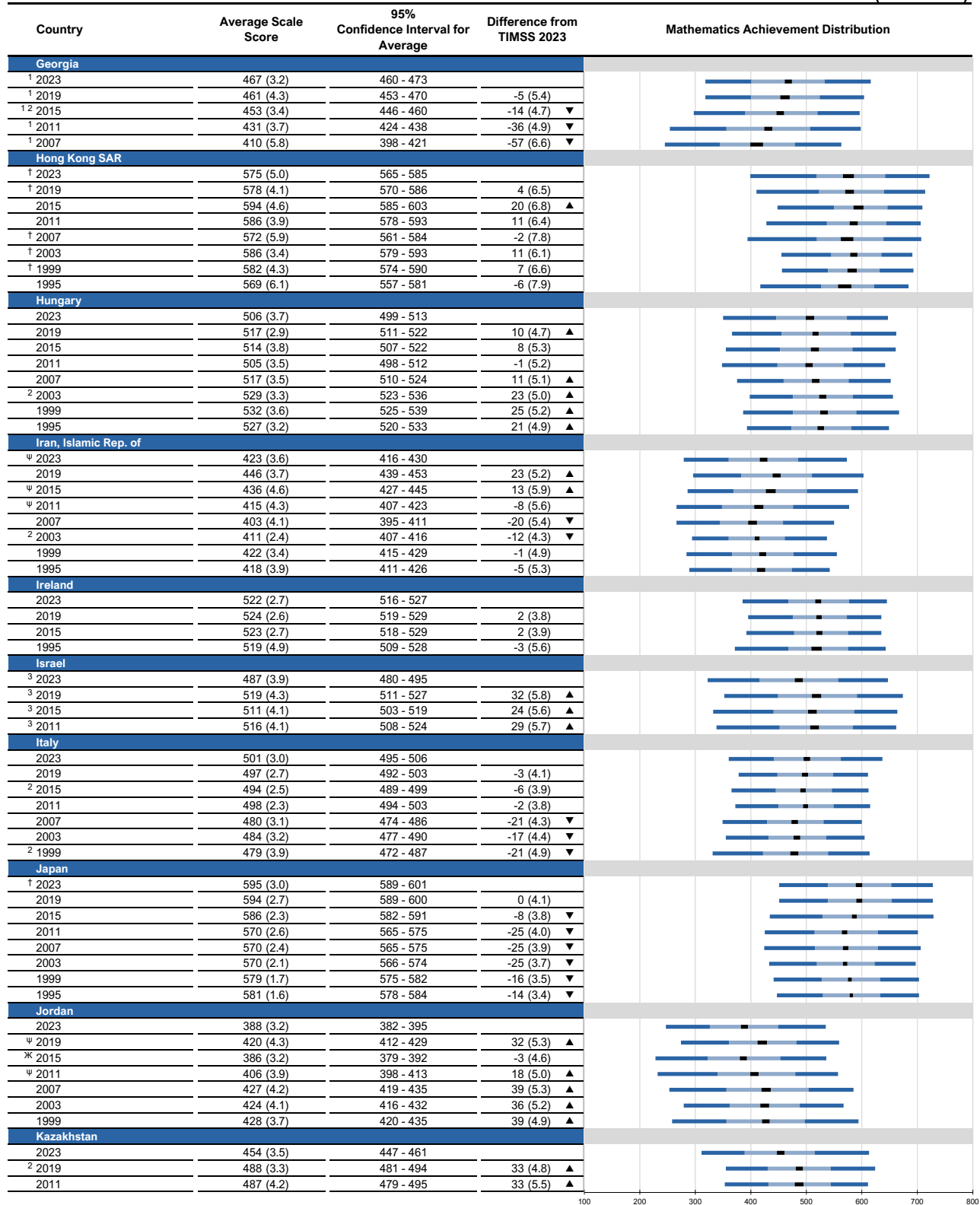
() Standard errors appear in parentheses. Because of rounding some results may appear inconsistent.

See Appendix B.7 for population coverage notes 1, 2, and 3. See Appendix B.10 for sampling guidelines and sampling participation notes †, ‡, and ≡.

ψ Reservations about reliability because the percentage of students with achievement too low for estimation exceeds 15% but does not exceed 25%.

Exhibit 1.2.10: Trends in Average Mathematics Achievement and Scale Score Distributions

(Continued)

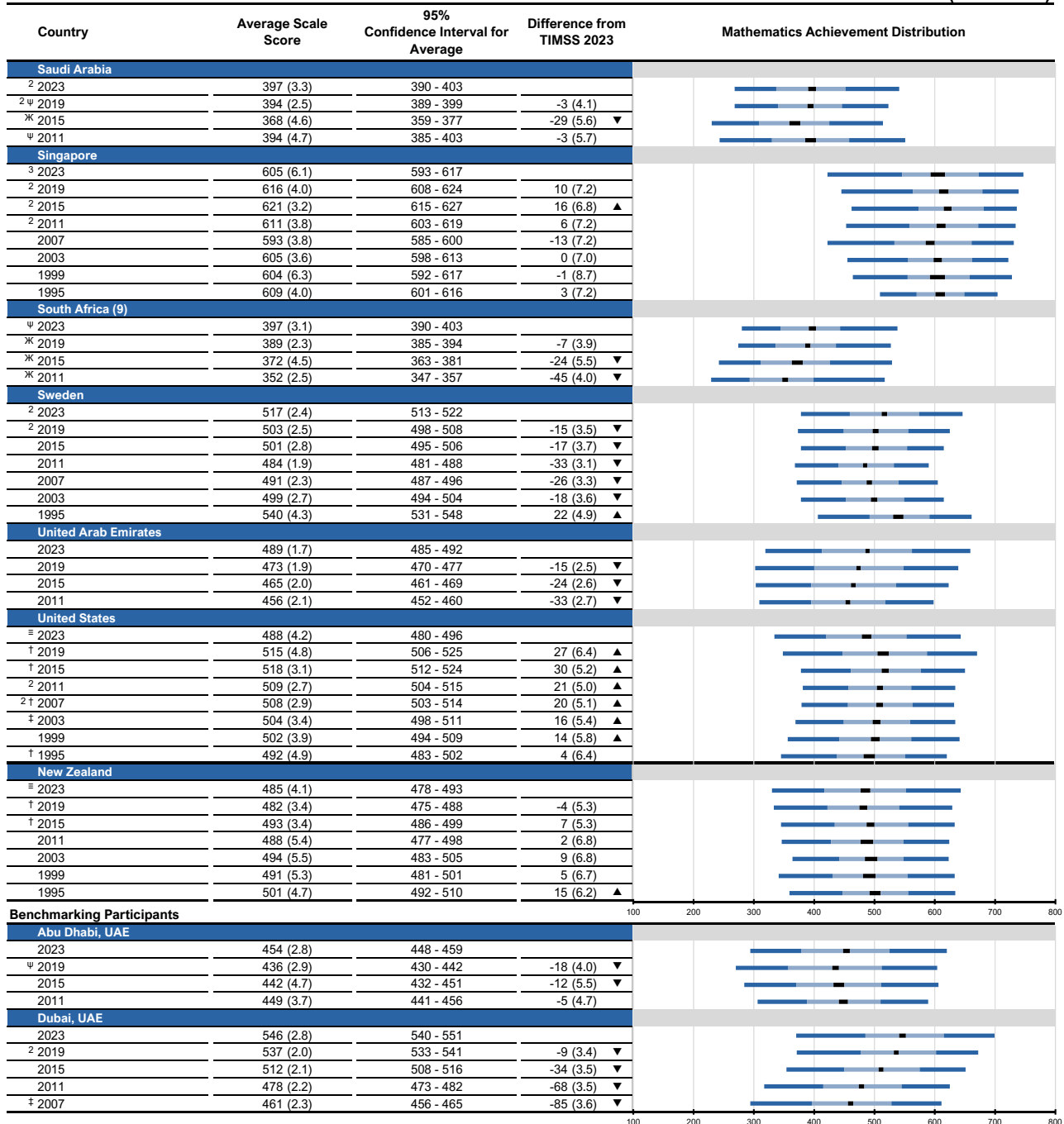


^ψ Reservations about reliability because the percentage of students with achievement too low for estimation exceeds 15% but does not exceed 25%.
[✕] Average achievement not reliably measured because the percentage of students with achievement too low for estimation exceeds 25%.

SOURCE: IEA's Trends in International Mathematics and Science Study - TIMSS 2023
 Downloaded from <https://timss2023.org/results>

Exhibit 1.2.10: Trends in Average Mathematics Achievement and Scale Score Distributions

(Continued)



New Zealand did not satisfy guidelines for minimum school participation rates in 2023.

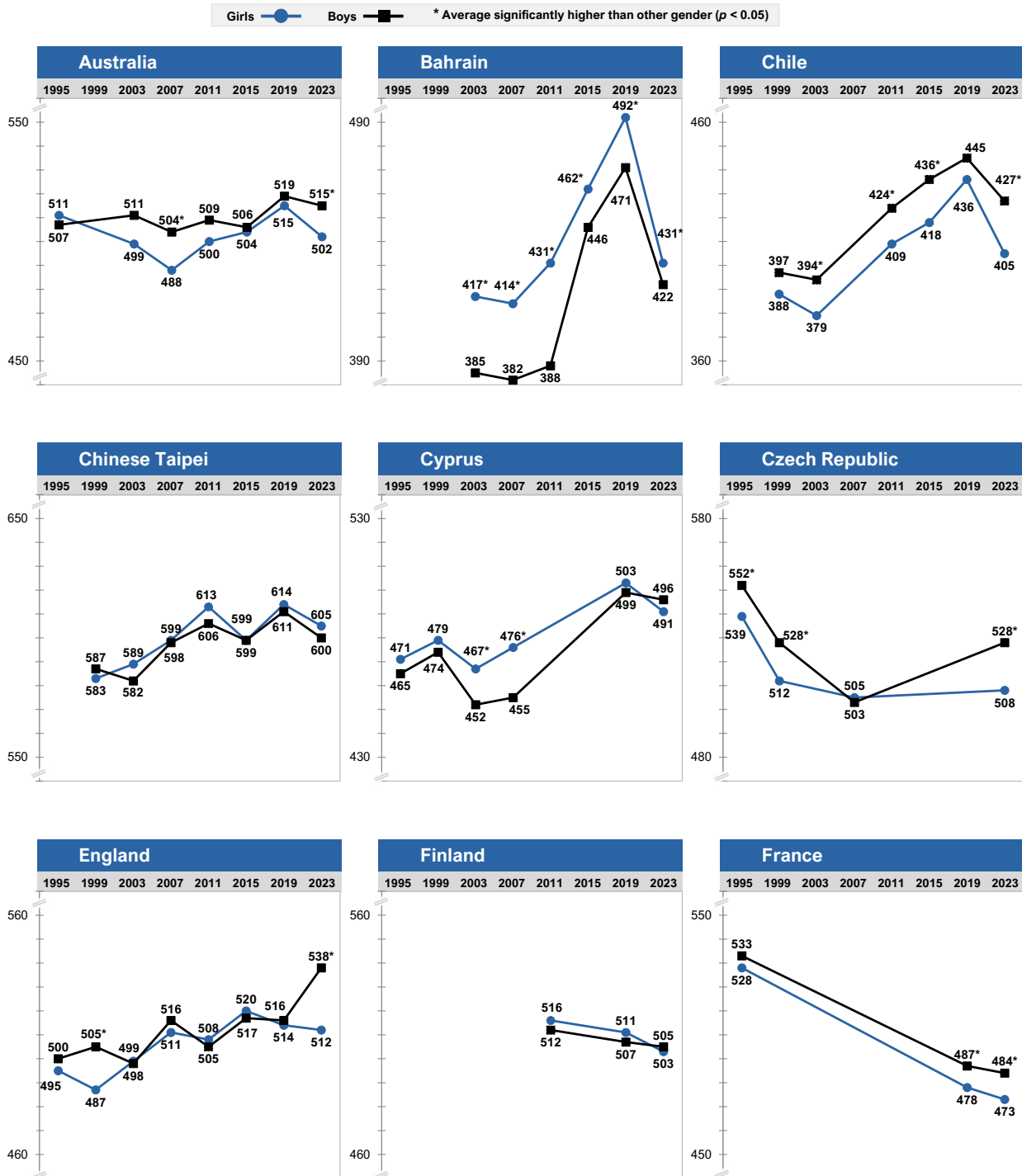
^ψ Reservations about reliability because the percentage of students with achievement too low for estimation exceeds 15% but does not exceed 25%.^κ Average achievement not reliably measured because the percentage of students with achievement too low for estimation exceeds 25%.SOURCE: IEA's Trends in International Mathematics and Science Study - TIMSS 2023
Downloaded from <https://timss2023.org/results>

Trend Plots of Average Mathematics Achievement for Girls and Boys (Grade 8)

For the TIMSS 2023 countries with comparable data from previous TIMSS assessments, Exhibit 1.2.11 contains graphs of average mathematics achievement across assessment cycles for girls and boys. In each country graph, the y-axis ranges 120 points with a scale interval of 10 points, but a different part of the scale is shown according to each country's average achievement. Generally, the difference in average mathematics achievement between girls and boys has remained relatively stable across TIMSS assessments. Of the 34 countries with comparable data in 2019 and 2023, 11 had no difference between girls and boys in both assessment cycles. However, 10 countries with no difference between girls and boys in TIMSS 2019 had a gap favoring boys in TIMSS 2023. In four countries the achievement gap was closed such that the difference between girls and boys was flagged as statistically significant in 2019, but not in 2023.

Exhibit 1.2.11: Trend Plots of Average Mathematics Achievement for Girls and Boys

This exhibit displays changes in achievement across assessment years for girls and boys for the countries and benchmarking participants that have comparable data from previous TIMSS assessments. The scale interval is 10 points for each country, but a different part of the scale is shown according to each country's average achievement. See Appendix A for country participation in previous assessments.



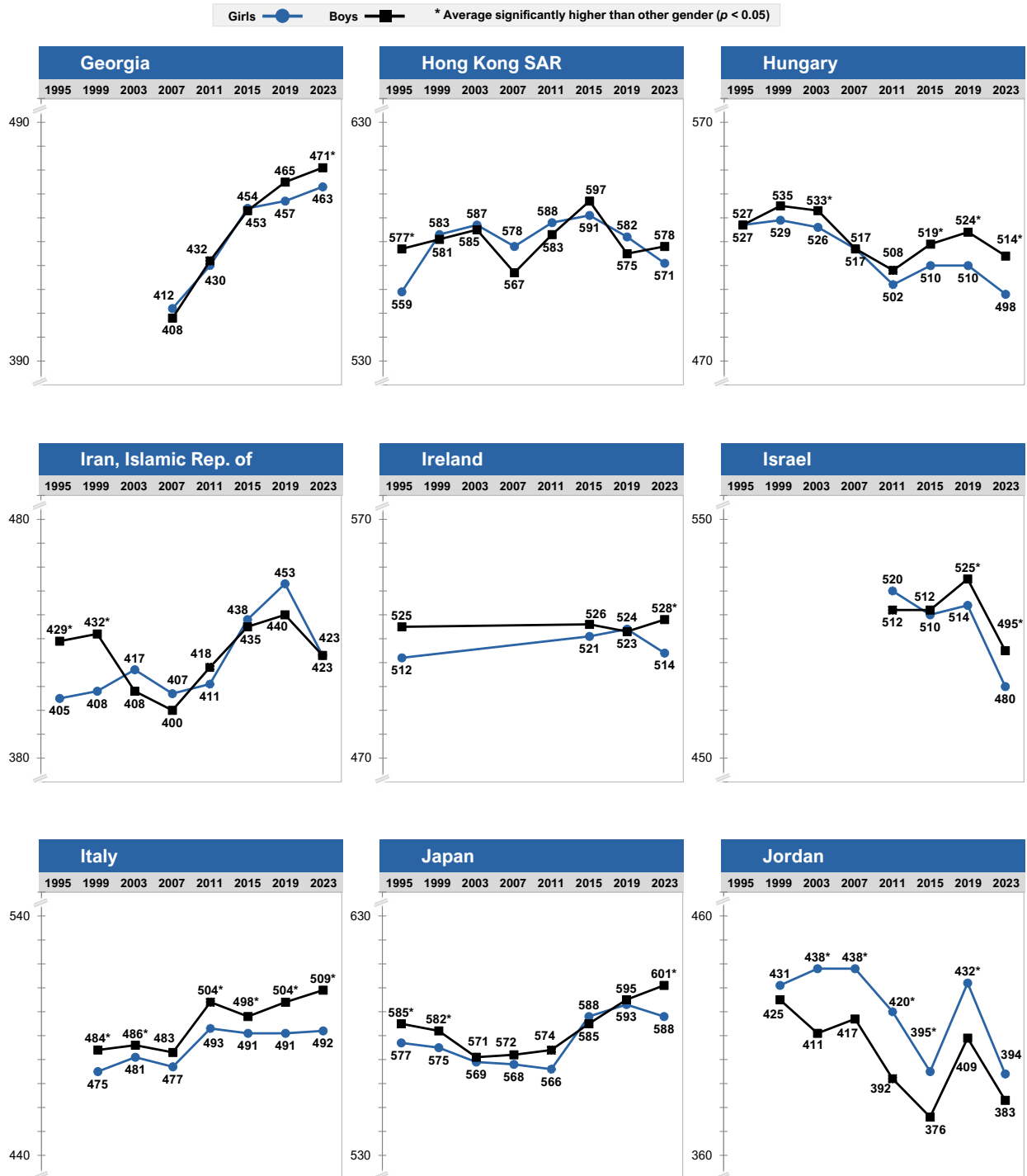
See Appendix A for country participation in previous TIMSS assessments.
The scale interval is 10 points for each country, but a different part of the scale is shown according to each country's average achievement.
Students' gender information was obtained from school tracking data.

SOURCE: IEA's Trends in International Mathematics and Science Study - TIMSS 2023
Downloaded from <https://timss2023.org/results>

Exhibit 1.2.11: Trend Plots of Average Mathematics Achievement for Girls and Boys

(Continued)

This exhibit displays changes in achievement across assessment years for girls and boys for the countries and benchmarking participants that have comparable data from previous TIMSS assessments. The scale interval is 10 points for each country, but a different part of the scale is shown according to each country's average achievement. See Appendix A for country participation in previous assessments.



See Appendix A for country participation in previous TIMSS assessments.

The scale interval is 10 points for each country, but a different part of the scale is shown according to each country's average achievement.

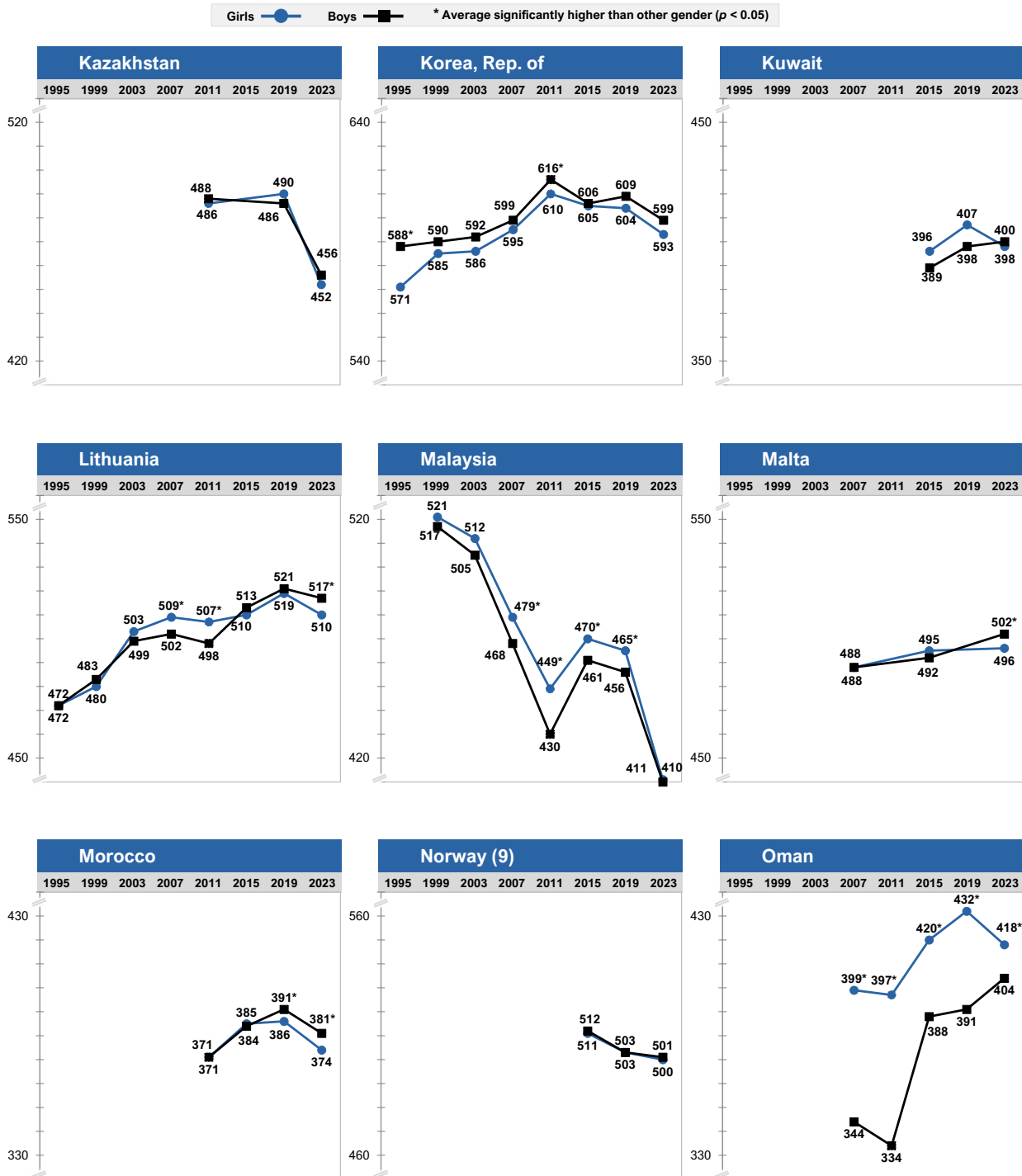
Students' gender information was obtained from school tracking data.

SOURCE: IEA's Trends in International Mathematics and Science Study - TIMSS 2023
Downloaded from <https://timss2023.org/results>

Exhibit 1.2.11: Trend Plots of Average Mathematics Achievement for Girls and Boys

(Continued)

This exhibit displays changes in achievement across assessment years for girls and boys for the countries and benchmarking participants that have comparable data from previous TIMSS assessments. The scale interval is 10 points for each country, but a different part of the scale is shown according to each country's average achievement. See Appendix A for country participation in previous assessments.



See Appendix A for country participation in previous TIMSS assessments.

The scale interval is 10 points for each country, but a different part of the scale is shown according to each country's average achievement.

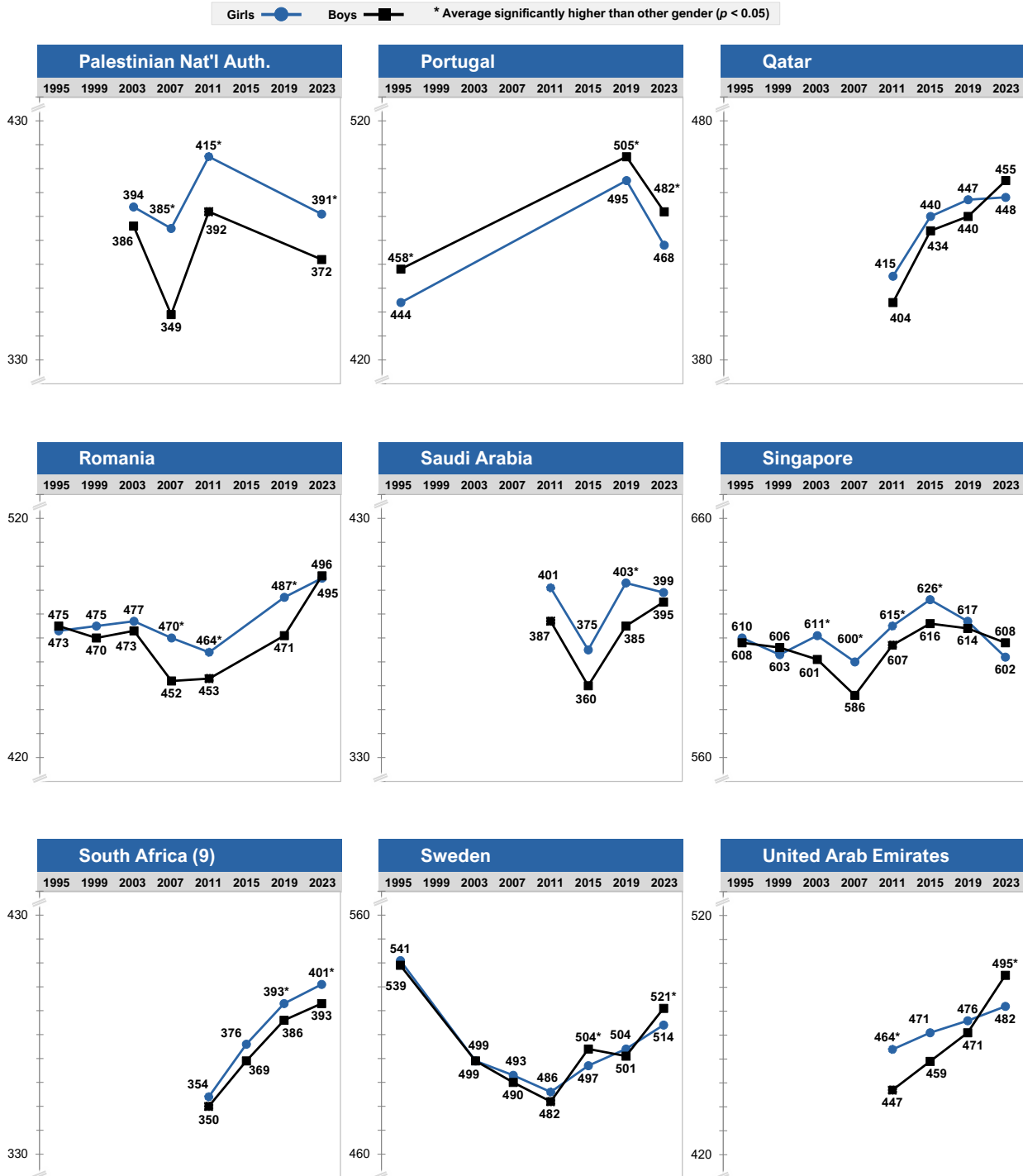
Students' gender information was obtained from school tracking data.

SOURCE: IEA's Trends in International Mathematics and Science Study - TIMSS 2023
Downloaded from <https://timss2023.org/results>

Exhibit 1.2.11: Trend Plots of Average Mathematics Achievement for Girls and Boys

(Continued)

This exhibit displays changes in achievement across assessment years for girls and boys for the countries and benchmarking participants that have comparable data from previous TIMSS assessments. The scale interval is 10 points for each country, but a different part of the scale is shown according to each country's average achievement. See Appendix A for country participation in previous assessments.



See Appendix A for country participation in previous TIMSS assessments.

The scale interval is 10 points for each country, but a different part of the scale is shown according to each country's average achievement.

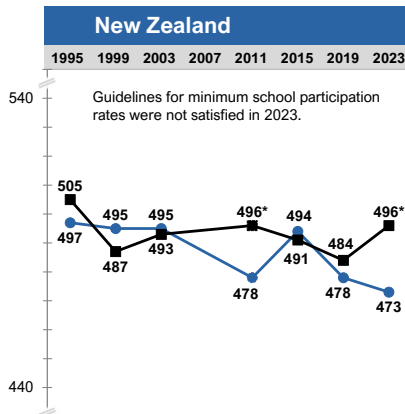
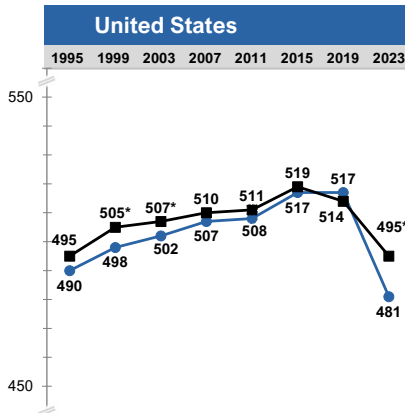
Students' gender information was obtained from school tracking data.

Exhibit 1.2.11: Trend Plots of Average Mathematics Achievement for Girls and Boys

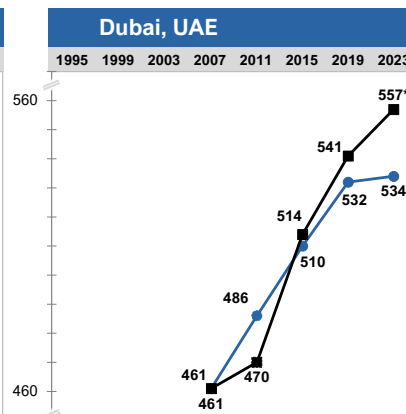
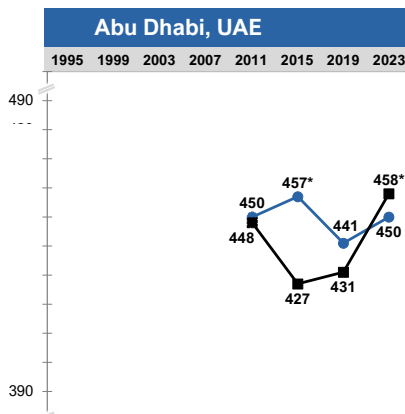
(Continued)

This exhibit displays changes in achievement across assessment years for girls and boys for the countries and benchmarking participants that have comparable data from previous TIMSS assessments. The scale interval is 10 points for each country, but a different part of the scale is shown according to each country's average achievement. See Appendix A for country participation in previous assessments.

Girls — Boys * Average significantly higher than other gender ($p < 0.05$)



Benchmarking Participants



See Appendix A for country participation in previous TIMSS assessments.
The scale interval is 10 points for each country, but a different part of the scale is shown according to each country's average achievement.
Students' gender information was obtained from school tracking data.

SOURCE: IEA's Trends in International Mathematics and Science Study - TIMSS 2023
Downloaded from <https://timss2023.org/results>

Trends in Distributions of Students Reaching the TIMSS International Benchmarks of Mathematics Achievement (Grade 8)

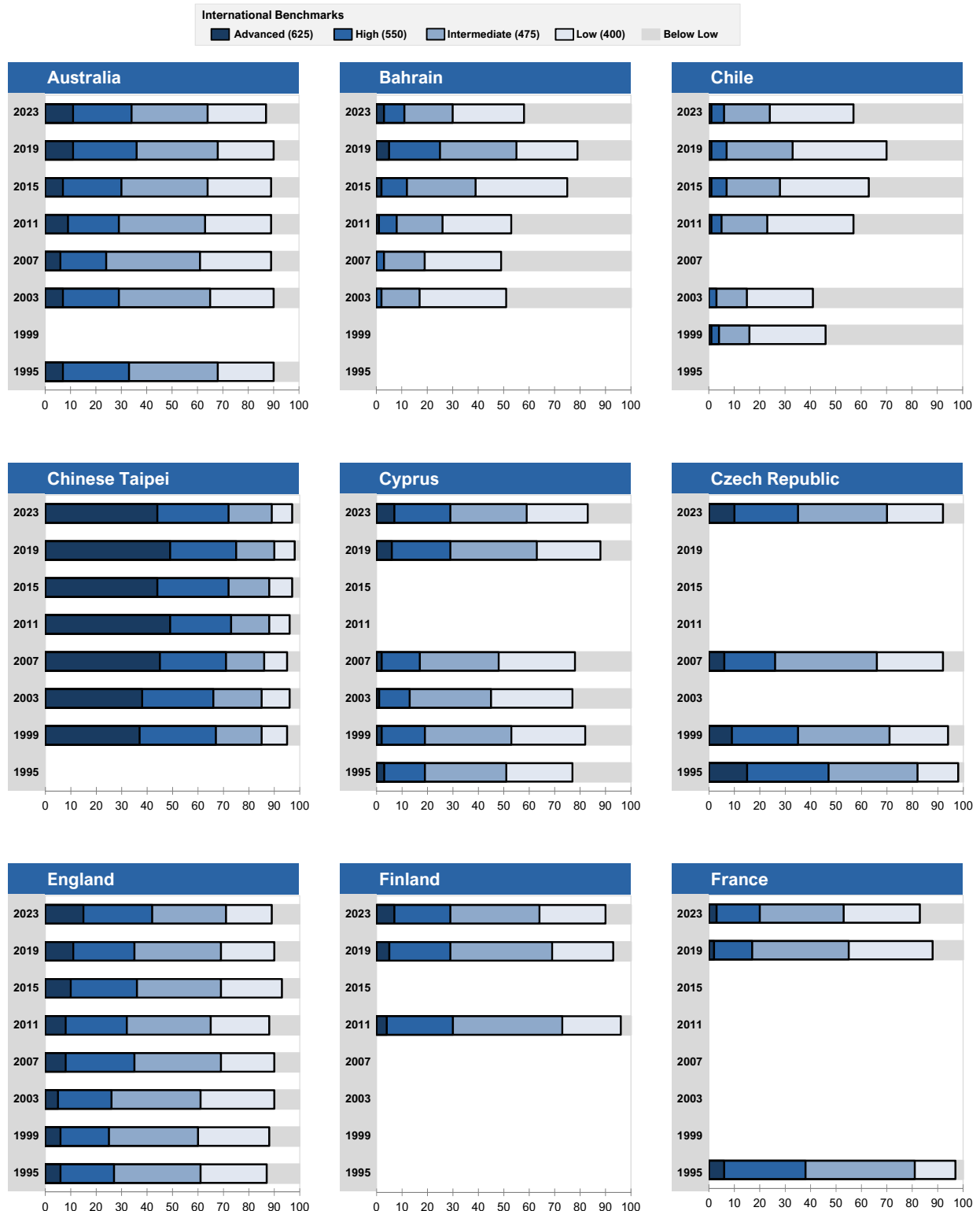
Exhibit 1.2.12 provides bar graphs for each country and benchmarking participant with comparable data from previous TIMSS assessments, presenting the distribution of students at the TIMSS International Benchmarks with a bar for each cycle from 1995 to 2023. Each bar displays the percentage of students reaching each of the International Benchmarks for a given assessment cycle. The shading of the bar segments ranges from dark to light blue, and each lighter-colored segment indicates the cumulative percentage of students that reached the less demanding benchmarks. Few students in most countries reach the Advanced Benchmark (darkest blue segment); more students reach the High Benchmark (dark blue plus medium blue segments); even more students reach the Intermediate Benchmark (indicated by three darker segments); finally, in most countries, a large majority of students reaches the Low Benchmark (all shades of blue combined). The gray area indicates the percentage of students that did not reach the Low International Benchmark (i.e., were “below low”). The achievement of these students cannot be characterized by any of the TIMSS 2023 International Benchmarks.

Students reaching the Intermediate, High, and Advanced International Benchmarks demonstrated all the mathematics skills at their level but also those displayed by the students at the lower levels. Long-term increases in the percentages of students reaching the Low and Intermediate Benchmarks provide an indication that more students over time demonstrate a basic level of mathematics proficiency.

The short-term trends between TIMSS 2019 and TIMSS 2023 show more decreases than increases in percentages of students reaching the International Benchmarks, especially at the lower end of the scale. Of the 34 countries that participated in both 2019 and 2023 with comparable data, 5 increased and 7 decreased at the Advanced International Benchmark, 6 increased and 9 decreased at the High Benchmark, 3 increased and 13 decreased at the Intermediate Benchmark, and 3 increased and 17 decreased at the Low Benchmark.

Exhibit 1.2.12: Trends in Distributions of Students Reaching the TIMSS International Benchmarks of Mathematics Achievement

This exhibit displays changes in percentages of students reaching the TIMSS International Benchmarks across assessment cycles for the countries and benchmarking participants that have comparable data from previous assessments. See Appendix A for country participation in previous assessments.



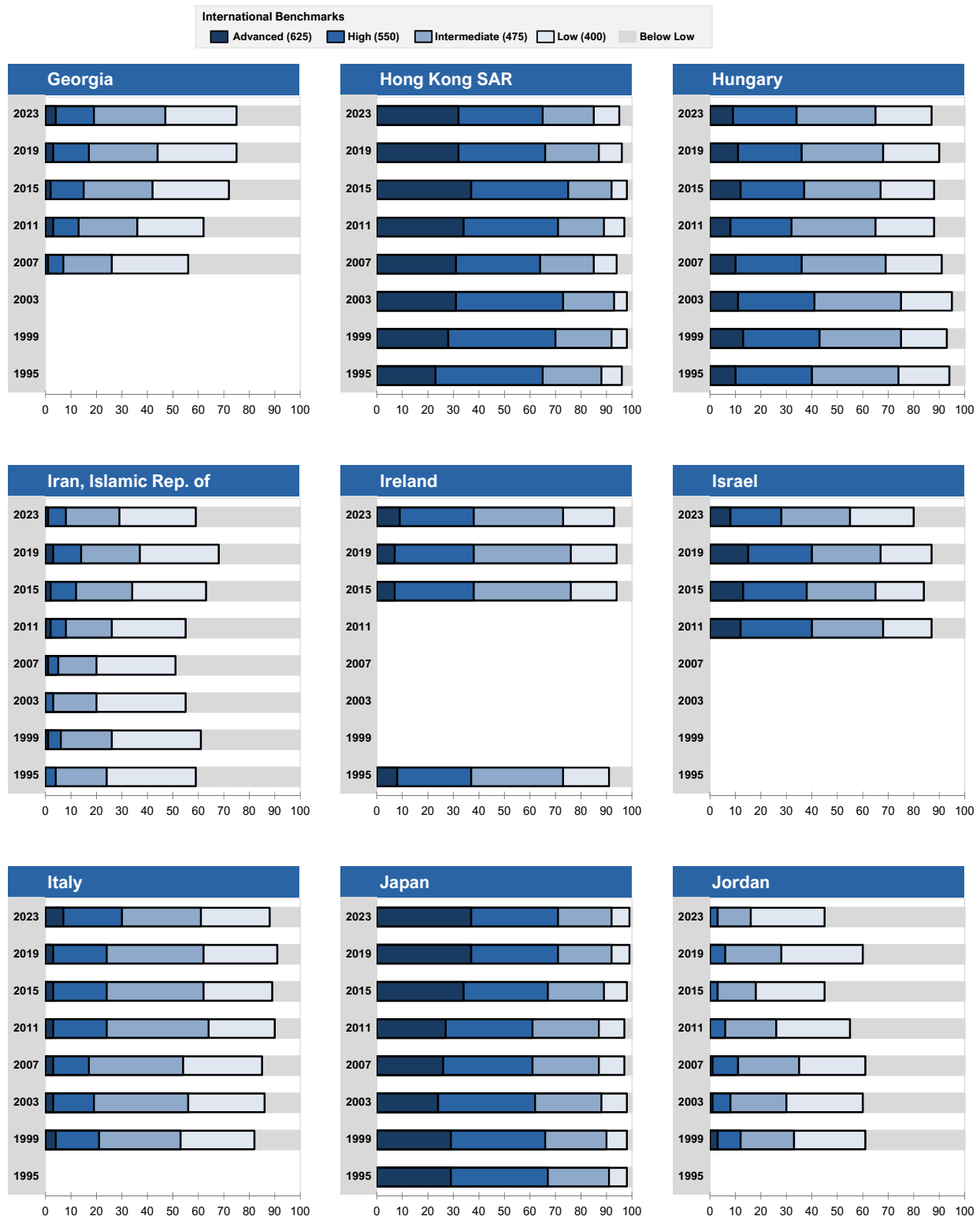
See Appendix A for country participation in previous TIMSS assessments.

SOURCE: IEA's Trends in International Mathematics and Science Study - TIMSS 2023
Downloaded from <https://timss2023.org/results>

Exhibit 1.2.12: Trends in Distributions of Students Reaching the TIMSS International Benchmarks of Mathematics Achievement

(Continued)

This exhibit displays changes in percentages of students reaching the TIMSS International Benchmarks across assessment cycles for the countries and benchmarking participants that have comparable data from previous assessments. See Appendix A for country participation in previous assessments.



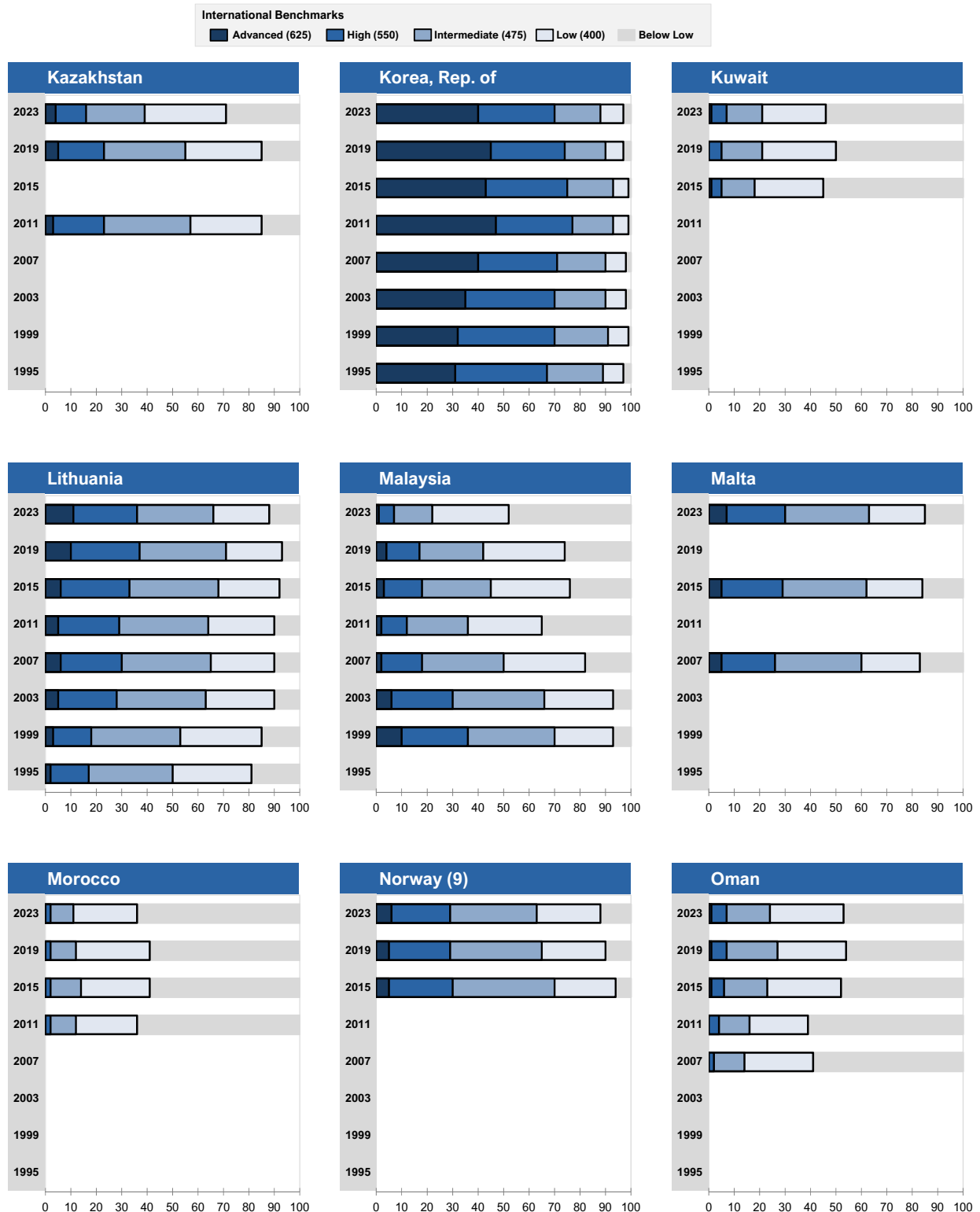
See Appendix A for country participation in previous TIMSS assessments.

SOURCE: IEA's Trends in International Mathematics and Science Study - TIMSS 2023
Downloaded from <https://timss2023.org/results>

Exhibit 1.2.12: Trends in Distributions of Students Reaching the TIMSS International Benchmarks of Mathematics Achievement

(Continued)

This exhibit displays changes in percentages of students reaching the TIMSS International Benchmarks across assessment cycles for the countries and benchmarking participants that have comparable data from previous assessments. See Appendix A for country participation in previous assessments.



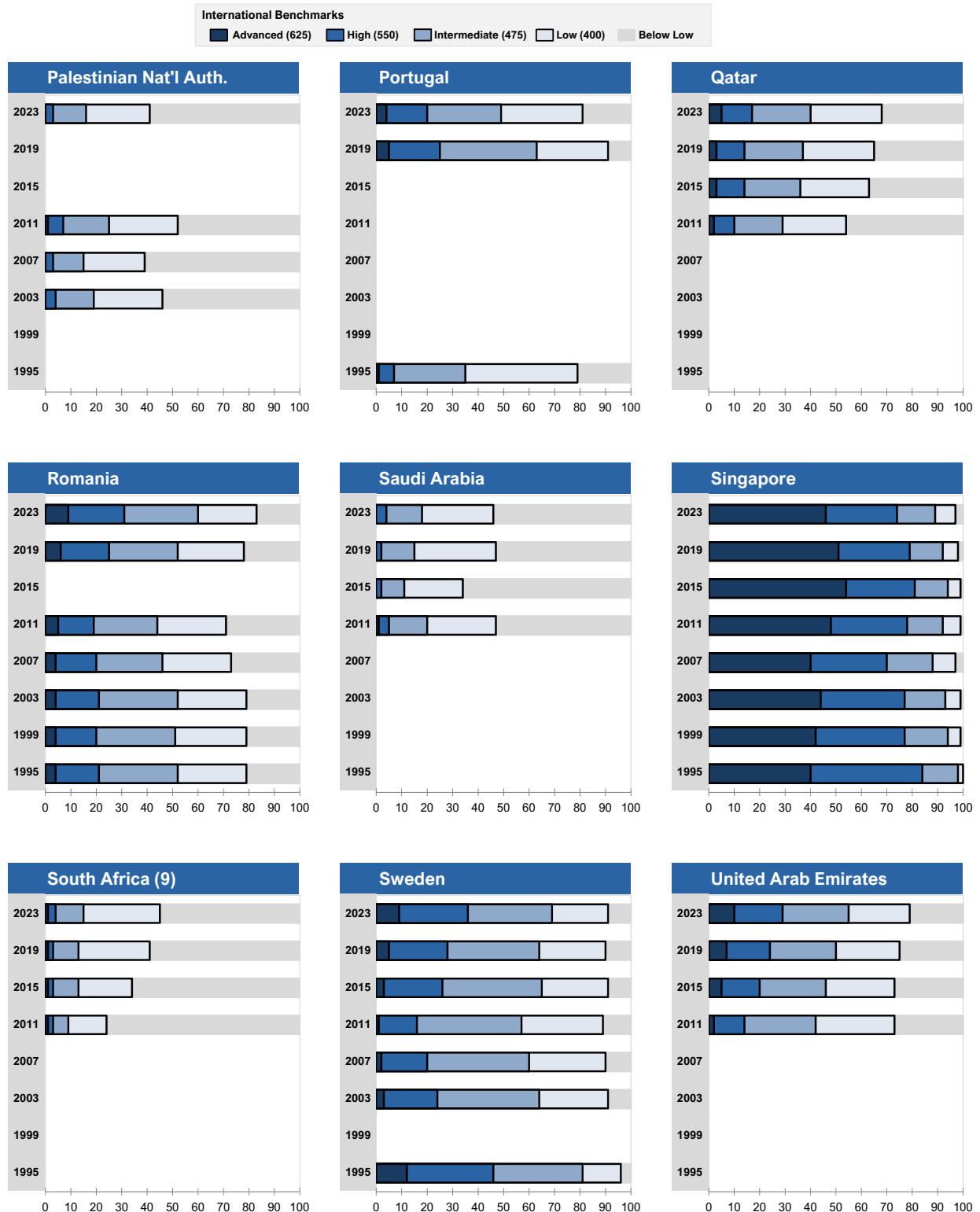
See Appendix A for country participation in previous TIMSS assessments.

SOURCE: IEA's Trends in International Mathematics and Science Study - TIMSS 2023
Downloaded from <https://timss2023.org/results>

Exhibit 1.2.12: Trends in Distributions of Students Reaching the TIMSS International Benchmarks of Mathematics Achievement

(Continued)

This exhibit displays changes in percentages of students reaching the TIMSS International Benchmarks across assessment cycles for the countries and benchmarking participants that have comparable data from previous assessments. See Appendix A for country participation in previous assessments.



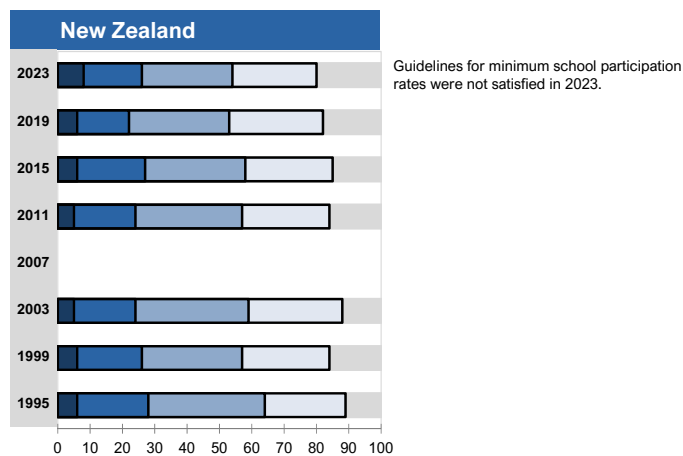
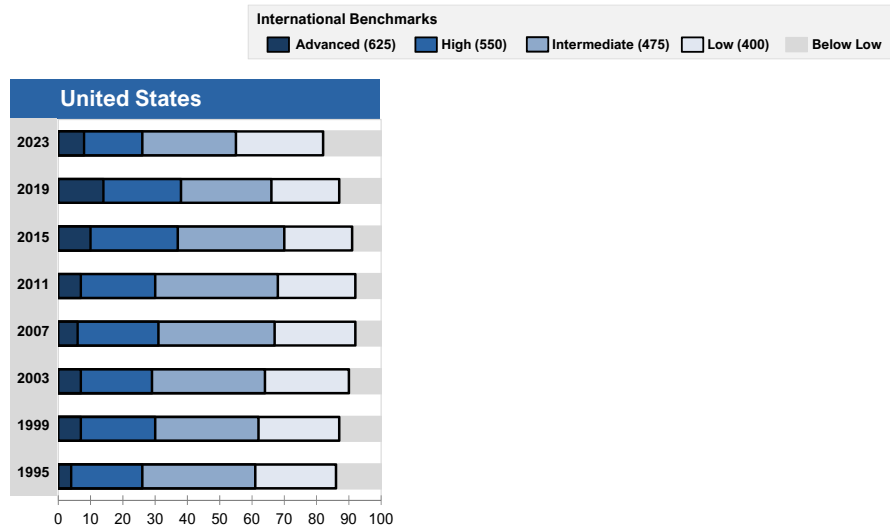
See Appendix A for country participation in previous TIMSS assessments.

SOURCE: IEA's Trends in International Mathematics and Science Study - TIMSS 2023
Downloaded from <https://timss2023.org/results>

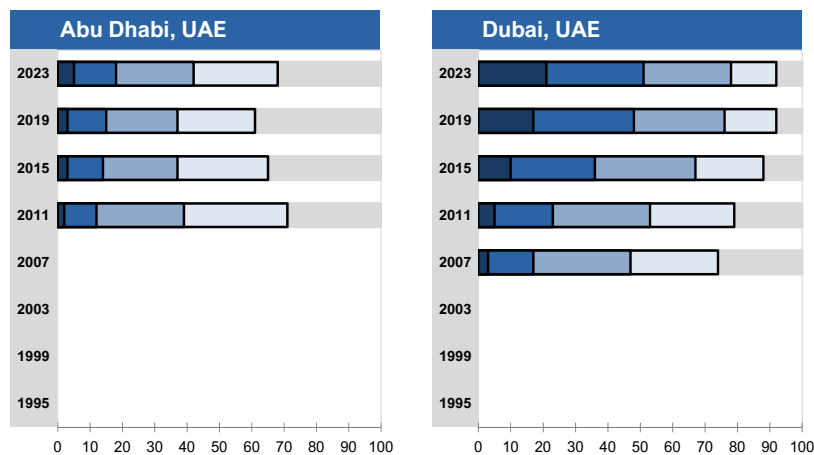
Exhibit 1.2.12: Trends in Distributions of Students Reaching the TIMSS International Benchmarks of Mathematics Achievement

(Continued)

This exhibit displays changes in percentages of students reaching the TIMSS International Benchmarks across assessment cycles for the countries and benchmarking participants that have comparable data from previous assessments. See Appendix A for country participation in previous assessments.



Benchmarking Participants



See Appendix A for country participation in previous TIMSS assessments.

SOURCE: IEA's Trends in International Mathematics and Science Study - TIMSS 2023
 Downloaded from <https://timss2023.org/results>

Grade 8 Relative Achievement in Mathematics Content and Cognitive Domains

Introduction to Mathematics Content and Cognitive Domains (Grade 8)

The [TIMSS 2023 Mathematics Framework](#) specifies four content domains in mathematics at the eighth grade: number, algebra, geometry and measurement, and data and probability. The proportion of items in the assessment belonging to these domains relates to the number of topics covered in each domain. These framework specifications informed assessment composition and item development.

Number Content Domain

The number content domain comprised 30 percent of the eighth-grade mathematics assessment. These topics are equally split into applying number properties to integers such as negative integers and square roots (10%); adding, subtracting, multiplying, and dividing by fractions and decimals (10%); and representing and relating ratio, proportion, and percent (10%).

Algebra Content Domain

Thirty percent of the assessment was devoted to algebra, including expressions, operations, equations (20%), relationships, and functions (10%). Students were asked to employ algebraic models and compare expressions using inequalities. Students were also presented with questions about solving linear equations and simplifying expressions. Students were asked to interpret and represent relationships graphically and to engage with properties of linear functions and algebraic expressions.

Geometry and Measurement Content Domain

Twenty percent of the assessment was devoted to geometry and measurement. Eighth-grade students were asked to analyze the properties of a variety of two- and three-dimensional figures, relate these representations, and calculate perimeters, areas, and volumes. They were also asked to solve problems and provide explanations based on transformations on the Cartesian plane and use geometric properties such as congruence, similarity, and the Pythagorean theorem.

Data and Probability Content Domain

The remaining 20 percent of the assessment was devoted to the data and probability content domain, which consisted of two topic areas: data (15%) and probability (5%). Students were asked to interpret data across multiple sources, represent data in a variety of visual displays, and demonstrate familiarity with the mean and median of distributions. Students were also asked to find the probability based on given scenarios or complete a representation based on the probability of an occurrence.

Knowing, Applying, and Reasoning Cognitive Domains

The [TIMSS 2023 Mathematics Framework](#) also specified the cognitive skills eighth-grade students needed to draw on across the content domains described above. These skills were categorized into three broad cognitive domains—knowing, applying, and reasoning. Thirty-five percent of the eighth-grade assessment was devoted to the knowing cognitive domain, 40 percent to applying, and 25 percent to reasoning. The knowing domain included accessing straightforward facts, concepts, and procedures through recall, simple computation, or classification. The applying domain focused on students’ ability to act upon knowledge and conceptual understanding to devise strategies, implement them, and give results. The reasoning domain targeted skills beyond solving familiar problems that may have been routinely practiced in mathematics lessons to encompass generalizations to unfamiliar situations, justifying approaches used, and integration across multi-step problems.

The results in the content and cognitive subscales are presented to provide a more nuanced view of overall mathematics achievement. The comparison between overall mathematics achievement and particular subscales may indicate countries’ relative strengths and weaknesses within overall mathematics. However, the subscales are based on only a subset of the assessment items, making them somewhat less robust than the overall mathematics achievement results based on the entire set of items.

For information about how the subscales for the content and cognitive domains were created, see Chapter 12 in the [TIMSS 2023 Technical Report](#).

Relative Achievement in Mathematics Content Domains (Grade 8)

Exhibit 1.2.13 shows countries’ average achievement in each of the four mathematics content domains relative to their overall average achievement (presented from highest to lowest overall average achievement as the default sort). The exhibit also highlights differences based on a test of statistical significance between the average domain score and the overall mathematics score using an alpha level of 0.01. A smaller alpha level was used to flag statistical significance of subdomain differences to reduce the number of false positives that can be expected due to multiple comparisons across multiple countries and dependent sub-scores. Differences are computed for each student and averaged across the country, rather than comparing different groups of students as in previous exhibits in this section. This within-student dependency leads to considerably smaller standard errors (given in parentheses and reported together with the estimates in the exhibit).

Of the 40 participating countries for which mathematics content domain scores were estimated with internationally comparable data, 14 had a relative strength in number and 11 had a relative weakness; 16 had a relative strength in algebra and 12 had a relative weakness; 10 had a relative strength in geometry and measurement and 17 had a relative weakness; and 13 had a relative strength in data and probability and 23 had a relative weakness.

Exhibit 1.2.13: Relative Achievement in Mathematics Content Domains

Country	Overall Mathematics Average Scale Score	Number (63 Items)		Algebra (58 Items)		Geometry and Measurement (42 Items)		Data and Probability (37 Items)	
		Average Scale Score	Difference from Overall Score	Average Scale Score	Difference from Overall Score	Average Scale Score	Difference from Overall Score	Average Scale Score	Difference from Overall Score
³ Singapore	605 (6.1)	606 (5.7)	1 (1.6)	604 (6.8)	-1 (1.8)	605 (6.0)	-1 (1.3)	615 (6.8)	10 (1.7) ▲
Chinese Taipei	602 (3.1)	611 (3.4)	9 (1.7) ▲	612 (3.2)	10 (1.4) ▲	600 (3.0)	-2 (1.6)	585 (2.9)	-17 (1.1) ▼
Korea, Rep. of	596 (3.0)	602 (3.1)	6 (1.5) ▲	595 (3.1)	-1 (1.4)	603 (3.6)	7 (1.6) ▲	584 (3.8)	-12 (2.9) ▼
[†] Japan	595 (3.0)	590 (3.7)	-5 (1.2) ▼	593 (3.5)	-2 (1.3)	600 (3.2)	5 (1.6) ▲	609 (3.2)	15 (2.0) ▲
[†] Hong Kong SAR	575 (5.0)	576 (5.3)	1 (1.2)	577 (5.5)	3 (1.3)	579 (5.6)	4 (1.3) ▲	562 (5.4)	-13 (1.7) ▼
² England	525 (4.5)	532 (4.8)	8 (1.5) ▲	513 (4.8)	-12 (1.6) ▼	519 (4.6)	-6 (1.1) ▼	537 (5.4)	12 (2.2) ▲
Ireland	522 (2.7)	528 (2.9)	6 (1.3) ▲	503 (2.9)	-19 (1.2) ▼	513 (3.3)	-8 (2.4) ▼	546 (3.3)	24 (1.3) ▲
² Czech Republic	518 (2.3)	525 (2.4)	7 (0.8) ▲	513 (2.6)	-5 (1.5) ▼	520 (2.5)	2 (1.0)	504 (2.3)	-14 (0.9) ▼
² Sweden	517 (2.4)	514 (2.4)	-4 (1.2) ▼	511 (2.8)	-6 (1.7) ▼	516 (3.1)	-1 (2.0)	532 (3.0)	15 (1.2) ▲
² Lithuania	514 (3.1)	509 (3.2)	-5 (1.1) ▼	512 (3.3)	-1 (0.8)	526 (3.3)	12 (0.9) ▲	506 (3.5)	-7 (1.6) ▼
² Austria	512 (2.3)	511 (2.3)	-1 (1.2) ▼	517 (2.7)	5 (2.1)	519 (2.8)	7 (1.7) ▲	495 (2.5)	-17 (0.8) ▼
Australia	509 (3.5)	505 (3.6)	-4 (1.2) ▼	498 (3.4)	-10 (0.9) ▼	506 (3.5)	-3 (1.6)	532 (3.8)	24 (1.0) ▲
³ Türkiye	509 (4.3)	511 (4.6)	2 (1.6)	498 (4.9)	-11 (1.5) ▼	496 (4.4)	-13 (2.1) ▼	529 (4.4)	20 (1.0) ▲
Hungary	506 (3.7)	510 (3.9)	4 (1.0) ▲	504 (3.9)	-2 (1.6)	506 (3.8)	0 (1.6)	498 (3.5)	-8 (0.9) ▼
Finland	504 (2.6)	504 (2.6)	0 (1.3)	490 (2.7)	-13 (0.8) ▼	513 (2.7)	9 (0.9) ▲	508 (2.9)	4 (1.2) ▲
² Norway (9)	501 (2.3)	495 (2.4)	-5 (1.2) ▼	485 (2.6)	-15 (1.0) ▼	506 (2.8)	6 (1.4) ▲	521 (3.3)	21 (2.2) ▲
Italy	501 (3.0)	502 (2.8)	2 (1.1)	492 (3.3)	-9 (1.9) ▼	509 (3.8)	8 (1.6) ▲	496 (3.2)	-5 (0.8) ▼
Malta	499 (1.2)	500 (1.3)	0 (0.8)	496 (1.6)	-3 (1.3)	496 (1.5)	-3 (1.3)	505 (1.6)	6 (1.3) ▲
² Romania	496 (4.9)	503 (4.7)	7 (1.2) ▲	502 (5.1)	6 (1.7) ▲	492 (5.1)	-4 (1.8)	467 (6.1)	-29 (2.8) ▼
Cyprus	494 (2.7)	487 (2.9)	-7 (1.3) ▼	507 (3.0)	14 (1.4) ▲	492 (3.0)	-2 (1.4)	486 (3.2)	-8 (1.7) ▼
United Arab Emirates	489 (1.7)	493 (1.7)	4 (0.4) ▲	496 (1.8)	8 (0.4) ▲	479 (2.0)	-10 (0.7) ▼	475 (1.9)	-13 (0.7) ▼
² United States	488 (4.2)	486 (4.4)	-2 (1.1)	492 (4.6)	4 (0.9) ▲	480 (4.0)	-8 (1.0) ▼	492 (4.1)	4 (1.1) ▲
³ Israel	487 (3.9)	485 (3.9)	-2 (1.0)	494 (4.1)	7 (1.9) ▲	484 (4.1)	-4 (1.7)	481 (4.4)	-6 (1.9) ▼
France	479 (3.1)	475 (3.2)	-3 (1.2) ▼	466 (3.6)	-13 (1.4) ▼	482 (3.6)	3 (1.8)	491 (3.5)	12 (1.4) ▲
Azerbaijan	479 (3.7)	494 (4.0)	15 (1.8) ▲	489 (4.2)	11 (1.9) ▲	458 (4.1)	-20 (1.9) ▼	442 (4.6)	-37 (2.5) ▼
Portugal	475 (2.7)	468 (2.6)	-8 (1.1) ▼	474 (3.3)	-1 (2.3)	485 (3.0)	10 (1.7) ▲	474 (2.5)	-1 (1.4)
¹ Georgia	467 (3.2)	477 (3.4)	10 (2.0) ▲	476 (3.5)	10 (1.6) ▲	452 (3.2)	-15 (1.7) ▼	433 (3.2)	-33 (2.1) ▼
Kazakhstan	454 (3.5)	454 (3.3)	0 (1.3)	466 (4.1)	12 (1.7) ▲	445 (3.4)	-9 (1.4) ▼	432 (3.4)	-22 (2.4) ▼
Qatar	451 (4.2)	448 (4.5)	-3 (1.7)	459 (4.4)	8 (1.4) ▲	441 (4.5)	-10 (1.2) ▼	443 (4.5)	-9 (1.4) ▼
Bahrain	426 (2.4)	423 (2.4)	-3 (1.7)	434 (2.8)	7 (1.4) ▲	416 (2.7)	-11 (1.7) ▼	421 (2.6)	-5 (1.7) ▼
^W Iran, Islamic Rep. of	423 (3.6)	416 (3.7)	-7 (2.1) ▼	424 (3.8)	1 (1.0)	406 (3.7)	-17 (1.3) ▼	423 (3.4)	-1 (1.5)
Uzbekistan	421 (4.3)	433 (4.6)	12 (1.2) ▲	427 (5.1)	6 (2.0) ▲	415 (4.3)	-6 (1.8) ▼	371 (4.8)	-50 (2.5) ▼
[†] Chile	416 (3.2)	411 (3.0)	-5 (1.6) ▼	414 (3.7)	-2 (2.9)	410 (3.0)	-6 (2.3)	420 (3.9)	4 (1.4) ▲
Oman	411 (2.7)	408 (2.8)	-3 (1.6)	419 (2.8)	8 (0.7) ▲	403 (2.7)	-8 (1.6) ▼	403 (2.7)	-8 (1.6) ▼
Malaysia	411 (3.5)	409 (3.6)	-2 (0.8)	406 (3.7)	-4 (1.1) ▼	417 (3.4)	6 (1.0) ▲	403 (3.5)	-8 (1.4) ▼
^W Kuwait	399 (5.2)	399 (5.4)	0 (2.1)	382 (6.1)	-17 (1.6) ▼	386 (6.3)	-13 (2.8) ▼	402 (4.5)	4 (2.2)
² Saudi Arabia	397 (3.3)	393 (3.7)	-4 (1.6) ▼	401 (3.5)	5 (1.0) ▲	385 (3.4)	-12 (2.1) ▼	397 (3.4)	0 (1.8)
^W South Africa (9)	397 (3.1)	410 (3.2)	13 (1.4) ▲	411 (3.6)	14 (1.8) ▲	358 (3.8)	-39 (1.3) ▼	341 (3.6)	-55 (1.8) ▼
Jordan	388 (3.2)	392 (3.1)	4 (1.4) ▲	405 (3.4)	17 (1.4) ▲	373 (3.6)	-15 (1.6) ▼	359 (4.0)	-29 (2.9) ▼
Morocco	378 (3.0)	382 (3.2)	5 (1.7) ▲	375 (3.8)	-3 (1.5)	380 (3.6)	2 (1.6)	354 (2.8)	-24 (1.3) ▼
^W Palestinian Nat'l Auth.	382 (3.0)	-	-	-	-	-	-	-	-
^W Brazil	378 (2.8)	-	-	-	-	-	-	-	-
² New Zealand	485 (4.1)	484 (4.2)	-1 (1.5)	472 (4.5)	-13 (1.9) ▼	483 (4.5)	-3 (2.8)	503 (4.0)	18 (1.5) ▲
^W Cote d'Ivoire	263 (4.9)	-	-	-	-	-	-	-	-
Benchmarking Participants									
Dubai, UAE	546 (2.8)	550 (2.7)	4 (0.9) ▲	552 (2.9)	6 (0.8) ▲	537 (3.0)	-9 (1.3) ▼	542 (3.3)	-4 (1.6)
Sharjah, UAE	496 (4.8)	501 (5.0)	5 (1.4) ▲	504 (5.0)	8 (1.4) ▲	486 (5.2)	-9 (1.9) ▼	476 (5.1)	-20 (1.6) ▼
Abu Dhabi, UAE	454 (2.8)	457 (2.7)	3 (0.9) ▲	462 (2.9)	8 (0.9) ▲	443 (2.9)	-11 (0.9) ▼	440 (3.2)	-13 (1.4) ▼

▲ ▼ Subscale score significantly different from overall score ($p < 0.01$)

Numbers of items are based on the TIMSS 2023 eighth-grade mathematics items included in scaling.

() Standard errors appear in parentheses. Because of rounding some results may appear inconsistent.

See Appendix B.7 for population coverage notes 1, 2, and 3. See Appendix B.10 for sampling guidelines and sampling participation notes †, ‡, and =.

W Reservations about reliability because the percentage of students with achievement too low for estimation exceeds 15% but does not exceed 25%.

X Average achievement not reliably measured because the percentage of students with achievement too low for estimation exceeds 25%.

A dash (-) indicates comparable data not available because average achievement could not be accurately estimated.

New Zealand did not satisfy guidelines for minimum school participation rates. Achievement could not be reliably estimated for Cote d'Ivoire.

SOURCE: IEA's Trends in International Mathematics and Science Study - TIMSS 2023
Downloaded from <https://timss2023.org/results>

Relative Achievement in Mathematics Cognitive Domains (Grade 8)

Exhibit 1.2.14 shows countries' average achievement estimates in the knowing, applying, and reasoning cognitive domains relative to their overall average achievement estimates (sorted from highest to lowest overall average achievement as the default sort). The exhibit also highlights differences based on a test of statistical significance between the average domain score and the overall mathematics score using an alpha level of 0.01. A smaller alpha level was used to flag statistical significance of subdomain differences to reduce the number of false positives that can be expected due to multiple comparisons across multiple countries and dependent sub-scores. Differences are computed for each student and averaged across the country, rather than comparing different groups of students as in previous exhibits in this section. This within student dependency leads to considerably smaller standard errors (given in parentheses and reported together with the estimates in the exhibit).

Few countries had a relative strength (and more countries had a relative weakness) in the reasoning cognitive domain compared to knowing and applying. In the knowing domain, 13 countries had a relative strength and 9 had a relative weakness. In the applying domain, 6 countries had a relative strength and 7 had a relative weakness. In reasoning, 7 countries had a relative strength and 17 had a relative weakness.

Exhibit 1.2.14: Relative Achievement in Mathematics Cognitive Domains

Country	Overall Mathematics Average Scale Score	Knowing (60 Items)		Applying (91 Items)		Reasoning (49 Items)	
		Average Scale Score	Difference from Overall Score	Average Scale Score	Difference from Overall Score	Average Scale Score	Difference from Overall Score
³ Singapore	605 (6.1)	606 (6.4)	1 (1.5)	611 (6.0)	6 (1.5) ▲	600 (6.6)	-6 (1.5) ▼
Chinese Taipei	602 (3.1)	611 (3.2)	8 (1.3) ▲	601 (3.0)	-2 (1.4)	600 (2.8)	-2 (1.0)
Korea, Rep. of	596 (3.0)	602 (3.1)	6 (1.5) ▲	596 (2.9)	0 (1.0)	592 (3.2)	-4 (1.1) ▼
[†] Japan	595 (3.0)	591 (2.8)	-4 (1.5)	594 (2.7)	-1 (1.3)	591 (3.2)	-4 (1.0)
[†] Hong Kong SAR	575 (5.0)	580 (5.0)	5 (0.7) ▲	575 (5.1)	0 (1.0)	569 (5.1)	-5 (2.0) ▼
² England	525 (4.5)	528 (4.4)	3 (0.9) ▲	530 (4.5)	5 (1.3) ▲	516 (4.9)	-9 (1.8) ▼
Ireland	522 (2.7)	520 (3.3)	-1 (1.6)	526 (2.8)	5 (1.2) ▲	516 (3.0)	-6 (1.9) ▼
² Czech Republic	518 (2.3)	514 (2.3)	-4 (1.0) ▼	518 (2.3)	0 (0.9)	524 (2.1)	6 (0.6) ▲
² Sweden	517 (2.4)	518 (2.2)	1 (1.1)	518 (2.3)	0 (0.9)	515 (2.6)	-2 (1.4)
² Lithuania	514 (3.1)	510 (3.2)	-3 (0.8) ▼	516 (3.1)	3 (0.8) ▲	514 (3.0)	1 (1.2)
² Austria	512 (2.3)	517 (2.3)	4 (1.7) ▲	509 (2.7)	-3 (1.9)	512 (2.5)	0 (1.6)
Australia	509 (3.5)	508 (3.5)	-1 (1.5)	511 (3.6)	2 (1.0)	504 (3.6)	-5 (1.2) ▼
³ [†] Türkiye	509 (4.3)	505 (4.6)	-4 (1.7)	510 (4.4)	1 (1.6)	511 (4.4)	3 (1.5)
Hungary	506 (3.7)	507 (3.8)	1 (1.0)	504 (3.8)	-2 (1.0)	507 (3.6)	1 (1.0)
Finland	504 (2.6)	505 (2.5)	2 (0.9)	504 (2.6)	0 (0.7)	501 (3.0)	-2 (1.8)
² Norway (9)	501 (2.3)	500 (2.1)	0 (0.8)	502 (2.2)	1 (0.8)	501 (2.9)	1 (2.0)
Italy	501 (3.0)	499 (2.9)	-2 (0.8)	498 (3.0)	-2 (1.1)	511 (3.1)	11 (1.4) ▲
Malta	499 (1.2)	507 (1.3)	8 (1.1) ▲	500 (1.3)	1 (1.0)	492 (2.0)	-8 (1.6) ▼
² Romania	496 (4.9)	502 (5.0)	7 (1.2) ▲	493 (4.8)	-3 (1.3)	498 (4.7)	3 (1.5)
Cyprus	494 (2.7)	503 (2.5)	9 (1.0) ▲	492 (2.7)	-1 (1.1)	491 (2.9)	-3 (1.4)
United Arab Emirates	489 (1.7)	495 (1.8)	7 (0.6) ▲	482 (1.8)	-6 (0.3) ▼	485 (1.8)	-4 (0.4) ▼
² United States	488 (4.2)	496 (4.5)	8 (1.0) ▲	484 (4.4)	-4 (1.1) ▼	480 (4.2)	-8 (0.9) ▼
³ Israel	487 (3.9)	491 (3.9)	4 (1.1) ▲	486 (3.6)	-1 (1.2)	488 (4.1)	1 (1.3)
France	479 (3.1)	477 (3.1)	-2 (1.0)	480 (3.0)	1 (1.0)	487 (3.3)	8 (0.9) ▲
Azerbaijan	479 (3.7)	497 (3.7)	18 (1.3) ▲	480 (3.6)	1 (1.4)	473 (3.7)	-6 (1.7) ▼
Portugal	475 (2.7)	466 (2.9)	-10 (0.9) ▼	477 (2.3)	2 (1.2)	490 (2.7)	14 (1.5) ▲
[†] Georgia	467 (3.2)	469 (3.1)	2 (1.0)	472 (2.8)	5 (1.7) ▲	466 (3.4)	0 (1.3)
Kazakhstan	454 (3.5)	450 (3.7)	-5 (1.7) ▼	457 (3.3)	3 (1.4)	453 (3.5)	-1 (1.5)
Qatar	451 (4.2)	455 (4.5)	3 (1.5)	445 (4.4)	-6 (1.1) ▼	445 (4.4)	-6 (1.7) ▼
Bahrain	426 (2.4)	427 (2.7)	1 (1.1)	420 (3.1)	-6 (1.8) ▼	420 (3.5)	-7 (2.7)
^ψ Iran, Islamic Rep. of	423 (3.6)	406 (4.4)	-18 (2.0) ▼	423 (3.2)	0 (1.0)	433 (3.7)	9 (1.5) ▲
Uzbekistan	421 (4.3)	416 (5.1)	-5 (1.8) ▼	423 (4.0)	3 (1.5)	418 (5.0)	-3 (2.4)
[†] Chile	416 (3.2)	416 (2.7)	0 (2.3)	419 (2.8)	3 (1.2)	434 (2.8)	18 (2.4) ▲
Oman	411 (2.7)	415 (2.9)	4 (0.8) ▲	401 (3.0)	-10 (1.4) ▼	404 (3.0)	-7 (1.1) ▼
Malaysia	411 (3.5)	392 (4.0)	-19 (0.9) ▼	409 (3.6)	-2 (0.8)	405 (3.6)	-5 (1.2) ▼
^ψ Kuwait	399 (5.2)	374 (7.0)	-25 (3.4) ▼	406 (4.9)	8 (1.7) ▲	393 (5.8)	-6 (2.5)
² Saudi Arabia	397 (3.3)	393 (3.6)	-3 (1.5)	390 (3.7)	-6 (1.7) ▼	379 (4.3)	-18 (2.4) ▼
^ψ South Africa (9)	397 (3.1)	397 (3.4)	1 (1.1)	398 (3.0)	2 (1.0)	377 (3.6)	-19 (1.4) ▼
Jordan	388 (3.2)	389 (3.5)	1 (1.8)	376 (3.5)	-12 (1.7) ▼	377 (3.7)	-11 (2.0) ▼
Morocco	378 (3.0)	374 (3.6)	-3 (1.1) ▼	376 (3.2)	-2 (1.6)	391 (3.4)	13 (1.7) ▲
^ψ Palestinian Nat'l Auth.	382 (3.0)	--	--	--	--	--	--
^ψ Brazil	378 (2.8)	--	--	--	--	--	--
² New Zealand	485 (4.1)	476 (4.8)	-9 (2.2) ▼	491 (4.1)	5 (1.5) ▲	487 (4.2)	1 (1.2)
[✱] Cote d'Ivoire	263 (4.9)	--	--	--	--	--	--
Benchmarking Participants							
Dubai, UAE	546 (2.8)	550 (2.8)	4 (0.9) ▲	544 (3.0)	-1 (1.0)	544 (2.8)	-2 (0.8)
Sharjah, UAE	496 (4.8)	504 (4.9)	8 (1.6) ▲	489 (4.9)	-7 (0.8) ▼	493 (5.1)	-2 (1.5)
Abu Dhabi, UAE	454 (2.8)	461 (3.0)	7 (1.1) ▲	445 (2.9)	-9 (0.6) ▼	448 (3.1)	-6 (1.0) ▼

▲ ▼ Subscale score significantly different from overall score ($p < 0.01$)

Numbers of items are based on the TIMSS 2023 eighth-grade mathematics items included in scaling.

() Standard errors appear in parentheses. Because of rounding some results may appear inconsistent.

See Appendix B.7 for population coverage notes 1, 2, and 3. See Appendix B.10 for sampling guidelines and sampling participation notes †, ‡, and §.

§ Reservations about reliability because the percentage of students with achievement too low for estimation exceeds 15% but does not exceed 25%.

✱ Average achievement not reliably measured because the percentage of students with achievement too low for estimation exceeds 25%.

A dash (-) indicates comparable data not available because average achievement could not be accurately estimated.

New Zealand did not satisfy guidelines for minimum school participation rates. Achievement could not be reliably estimated for Cote d'Ivoire.

SOURCE: IEA's Trends in International Mathematics and Science Study - TIMSS 2023
Downloaded from <https://timss2023.org/results>

Science Achievement

Grade 4 Science Achievement Distributions

Average Science Achievement and Scale Score Distributions (Grade 4)

The TIMSS 2023 fourth-grade science assessment was delivered fully digital and was based on a comprehensive [assessment framework](#) developed collaboratively with the participating countries to reflect their curricular goals. The fourth-grade science assessment included three content areas—life science (45%), physical science (35%), and earth science (20%). The framework prescribed that the science items assessed fourth-grade students in the three cognitive domains: knowing (40%), applying (40%), and reasoning (20%). To cover the framework at the fourth grade, the assessment comprised 176 items distributed across 14 item blocks with an average of 13 items per block.

The 2023 cycle marked the full transition to a computer-based assessment system, incorporating an [adaptive booklet rotation](#) to balance the proportion of more and less difficult booklets for countries with very high or very low expected average achievement. The 2023 assessment was carefully designed using a balanced incomplete block design, adhering to industry standards, and analyzed with state-of-the-art psychometric models. Consequently, the TIMSS 2023 science achievement results for all 58 countries and 5 benchmarking participants are reported on the same TIMSS fourth-grade science scale. The TIMSS fourth-grade science achievement scale was established in TIMSS 1995, based on the achievement data across all participating countries, treating each country equally. A centerpoint of 500 was set to correspond to the mean of overall achievement in 1995, with 100 points set to correspond to the standard deviation. Students' achievement is placed on the scale with each subsequent TIMSS cycle, most recently for TIMSS 2023.

Exhibit 2.1.1 reports the average science achievement estimates at the fourth grade for each of the 58 TIMSS 2023 participating countries and the 5 benchmarking entities. The exhibit also presents the corresponding confidence intervals, and standard deviations for each country, together with the associated standard errors for these estimates (given in parentheses). Additionally, it includes a visualization of the score distribution, illustrating percentiles of the distribution and the confidence interval of the average achievement. The exhibit includes an international average estimate of the mean and a confidence interval based on the 58 countries that participated in TIMSS 2023, with each country contributing equally. The standard error of this estimate reflects the variance of the estimated international average achievement based on these countries.

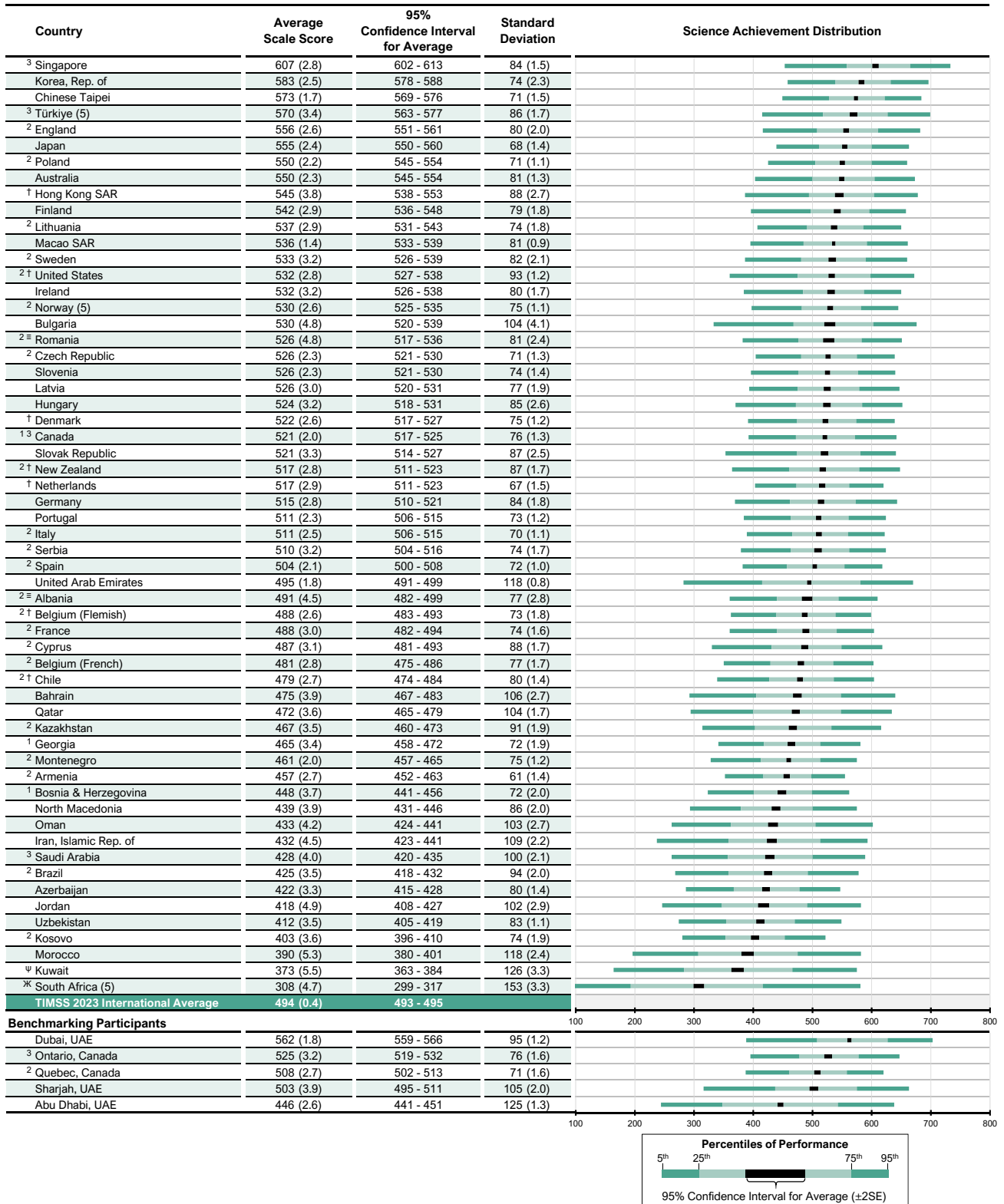
The exhibit is interactive and can be sorted by different criteria, with average achievement used as the default. Sorted by average achievement, the exhibit shows that Singapore had the highest estimated average achievement, followed by Korea, then by Chinese Taipei and Türkiye who performed similarly on average. Average achievement is high in these

countries. For example, the estimated average achievement in Korea is 583 and the 95% confidence interval ranges from 578 to 588. The confidence interval provides a score range around the estimated mean that illustrates the uncertainty in this estimate, which is based on a sample of students taking the assessment in a selection of classrooms within a sample of schools in each country. Intervals constructed in this way around the estimated average have a 95% chance to include the actual average of the country's achievement.

There is considerable variability in achievement not only across participants, but also within each country, as indicated by the standard deviation, the interquartile range, and the difference between the 10th and 90th percentiles of the achievement distribution shown in the table. Therefore, it would be incorrect to assume that (all) students in any country achieve higher scores than students in another country. While the average achievement of one country may be higher than the average achievement in another country, each country has some lower-achieving students and some higher-achieving students.

While examining the average achievement across countries can provide an initial impression of achievement in participating countries, the data collected by TIMSS 2023 and reported here is more comprehensive. TIMSS also provides information about the range of achievement observed in each country, and in later sections about associations with contextual factors, which provides a deeper understanding of student performance.

Exhibit 2.1.1: Average Science Achievement and Scale Score Distributions



The TIMSS achievement scale was established in 1995 based on the combined achievement distribution of all countries that participated in TIMSS 1995. To provide a point of reference for country comparisons, the scale centerpoint of 500 was located at the mean of the combined achievement distribution. The units of the scale were chosen so that 100 scale score points corresponded to the standard deviation of the combined achievement distribution.

([†]) Standard errors appear in parentheses. Because of rounding some results may appear inconsistent.

See Appendix B.2 for population coverage notes 1, 2, and 3. See Appendix B.5 for sampling guidelines and sampling participation notes †, ‡, and =.

^ψ Reservations about reliability because the percentage of students with achievement too low for estimation exceeds 15% but does not exceed 25%.

^κ Average achievement not reliably measured because the percentage of students with achievement too low for estimation exceeds 25%.

Average Science Achievement for Girls and Boys (Grade 4)

Exhibit 2.1.2 shows the differences in average science achievement between fourth-grade girls and boys in the 58 countries and 5 benchmarking participants, along with the average achievement for each of these groups, together with their associated standard errors (given in parentheses). Countries are sorted by default according to the size of the achievement difference between boys and girls, where negative differences indicate girls' average achievement is higher than boys, and positive differences indicate boys had a higher average than girls. In TIMSS 2023, a range of differences can be observed across countries. Twenty-six countries did not have average achievement differences between girls and boys significantly different from 0. However, there were 20 countries where boys showed higher average achievement than girls, and 12 countries where girls had higher achievement than boys. It can be observed that differences of about 7-8 points or more tend to be flagged as statistically significant with an alpha level of 0.05. In contrast, smaller differences tend not to be flagged as significant, unless their standard error (given in parentheses) is unusually small. Statistical significance does not necessarily imply that a difference is practically meaningful and achievement differences between girls and boys should always be considered in broader educational contexts within countries.

Exhibit 2.1.2: Average Science Achievement for Girls and Boys

Country	Girls		Boys		Difference	Difference	
	Percent of Students	Average Scale Score	Percent of Students	Average Scale Score		Girls Scored Higher	Boys Scored Higher
^{JK} South Africa (5)	50 (0.7)	328 (5.2)	50 (0.7)	289 (5.3)	-39 (4.7)		
Bahrain	48 (1.1)	492 (5.3)	52 (1.1)	459 (4.8)	-32 (6.4)		
³ Saudi Arabia	49 (1.0)	444 (5.9)	51 (1.0)	412 (4.9)	-32 (7.5)		
Jordan	52 (2.6)	428 (7.7)	48 (2.6)	406 (5.4)	-22 (9.0)		
^W Kuwait	51 (2.1)	383 (6.6)	49 (2.1)	363 (8.1)	-20 (9.8)		
Iran, Islamic Rep. of	49 (1.6)	442 (5.5)	51 (1.6)	423 (6.5)	-19 (8.3)		
Morocco	48 (0.9)	397 (5.7)	52 (0.9)	384 (5.6)	-13 (3.9)		
Oman	50 (0.6)	439 (4.3)	50 (0.6)	426 (4.7)	-13 (2.9)		
Azerbaijan	46 (0.8)	428 (3.4)	54 (0.8)	416 (3.7)	-11 (2.8)		
Finland	49 (0.9)	547 (2.9)	51 (0.9)	537 (3.5)	-10 (2.5)		
² Albania	48 (1.8)	495 (4.8)	52 (1.8)	487 (5.0)	-8 (4.1)		
North Macedonia	50 (0.7)	442 (4.2)	50 (0.7)	435 (4.3)	-8 (3.5)		
¹ Bosnia & Herzegovina	50 (1.1)	451 (3.5)	50 (1.1)	446 (4.7)	-6 (3.6)		
Ireland	49 (1.3)	534 (3.9)	51 (1.3)	530 (3.5)	-4 (3.8)		
² Lithuania	49 (0.8)	539 (3.0)	51 (0.8)	535 (3.3)	-4 (2.5)		
¹ Georgia	50 (0.8)	467 (4.0)	50 (0.8)	463 (3.6)	-4 (3.2)		
Latvia	49 (1.2)	527 (3.5)	51 (1.2)	524 (3.4)	-4 (3.2)		
Bulgaria	47 (0.8)	531 (4.8)	53 (0.8)	529 (5.5)	-2 (3.9)		
² Romania	49 (1.0)	527 (4.9)	51 (1.0)	525 (5.2)	-2 (3.4)		
² Norway (5)	50 (0.8)	531 (3.0)	50 (0.8)	530 (2.8)	-2 (2.7)		
Germany	49 (0.7)	516 (3.1)	51 (0.7)	515 (3.3)	-2 (3.0)		
¹ Denmark	51 (0.8)	523 (2.9)	49 (0.8)	521 (2.8)	-1 (2.6)		
² Poland	50 (0.9)	550 (2.7)	50 (0.9)	549 (2.6)	-1 (2.9)		
United Arab Emirates	49 (0.7)	494 (2.1)	51 (0.7)	496 (2.3)	1 (2.6)		
² Sweden	51 (0.8)	532 (3.3)	49 (0.8)	534 (3.7)	2 (2.8)		
² Armenia	49 (1.0)	456 (2.8)	51 (1.0)	458 (3.3)	2 (2.8)		
² Chile	47 (1.1)	478 (3.1)	53 (1.1)	480 (3.2)	2 (3.4)		
² Spain	49 (0.6)	503 (2.1)	51 (0.6)	505 (2.7)	2 (2.3)		
² New Zealand	49 (0.9)	516 (3.5)	51 (0.9)	518 (3.4)	3 (3.9)		
Qatar	49 (1.2)	471 (4.5)	51 (1.2)	474 (4.6)	3 (5.5)		
² Kosovo	48 (0.9)	401 (3.1)	52 (0.9)	405 (4.6)	3 (3.2)		
³ Türkiye (5)	48 (1.2)	568 (3.8)	52 (1.2)	572 (4.0)	4 (3.8)		
² Serbia	51 (0.9)	508 (3.3)	49 (0.9)	512 (4.0)	4 (3.6)		
² England	50 (0.9)	555 (2.9)	50 (0.9)	559 (3.4)	4 (3.4)		
² Montenegro	48 (0.8)	458 (2.3)	52 (0.8)	463 (2.5)	4 (2.6)		
Uzbekistan	49 (0.9)	410 (3.5)	51 (0.9)	414 (4.1)	4 (3.4)		
² Kazakhstan	49 (0.6)	464 (3.7)	51 (0.6)	469 (3.9)	5 (2.9)		
Slovenia	49 (0.8)	523 (2.6)	51 (0.8)	528 (2.7)	5 (2.5)		
¹ Canada	51 (0.6)	518 (2.2)	49 (0.6)	524 (2.4)	6 (2.0)		
Chinese Taipei	48 (0.5)	570 (2.1)	52 (0.5)	575 (2.4)	6 (2.9)		
Slovak Republic	50 (0.9)	518 (4.1)	50 (0.9)	523 (3.1)	6 (3.1)		
¹ Netherlands	50 (0.8)	514 (3.1)	50 (0.8)	520 (3.2)	6 (2.4)		
Japan	51 (0.5)	552 (2.5)	49 (0.5)	558 (2.8)	6 (2.3)		
² Czech Republic	49 (0.7)	523 (2.4)	51 (0.7)	529 (3.1)	6 (2.9)		
Hungary	50 (0.9)	521 (3.2)	50 (0.9)	527 (3.7)	6 (2.5)		
² Belgium (French)	50 (0.9)	477 (3.2)	50 (0.9)	484 (2.9)	7 (2.5)		
² United States	49 (0.5)	529 (2.9)	51 (0.5)	536 (3.2)	7 (2.4)		
² Cyprus	49 (0.8)	483 (3.6)	51 (0.8)	491 (3.6)	8 (3.7)		
² France	50 (0.8)	484 (3.4)	50 (0.8)	492 (3.1)	9 (2.6)		
² Brazil	50 (0.6)	420 (3.7)	50 (0.6)	430 (3.9)	9 (2.9)		
² Italy	48 (0.8)	506 (2.6)	52 (0.8)	515 (3.0)	9 (2.7)		
³ Singapore	49 (0.5)	603 (3.0)	51 (0.5)	612 (3.0)	10 (2.4)		
Australia	52 (1.0)	545 (2.8)	48 (1.0)	555 (2.9)	10 (3.4)		
¹ Hong Kong SAR	49 (1.2)	540 (4.6)	51 (1.2)	550 (3.9)	10 (3.5)		
Macao SAR	48 (0.7)	530 (1.6)	52 (0.7)	541 (2.1)	11 (2.4)		
² Belgium (Flemish)	49 (0.7)	482 (3.2)	51 (0.7)	494 (2.8)	12 (2.8)		
Portugal	50 (0.7)	504 (2.7)	50 (0.7)	517 (2.9)	13 (3.1)		
Korea, Rep. of	50 (0.5)	576 (3.0)	50 (0.5)	591 (2.9)	15 (3.1)		
International Average	49 (0.1)	495 (0.5)	51 (0.1)	494 (0.5)	-1 (0.5)		
Benchmarking Participants							
Abu Dhabi, UAE	50 (0.4)	448 (2.6)	50 (0.4)	444 (3.3)	-4 (2.8)		
Sharjah, UAE	48 (0.7)	503 (4.6)	52 (0.7)	503 (3.9)	0 (3.0)		
Dubai, UAE	48 (2.2)	560 (2.7)	52 (2.2)	565 (2.2)	5 (3.3)		
³ Ontario, Canada	52 (1.0)	522 (3.4)	48 (1.0)	528 (3.8)	6 (3.2)		
² Quebec, Canada	50 (0.8)	504 (3.0)	50 (0.8)	511 (3.3)	6 (3.2)		

Students' gender information was obtained from school tracking data.

() Standard errors appear in parentheses. Because of rounding some results may appear inconsistent.

See Appendix B.2 for population coverage notes 1, 2, and 3. See Appendix B.5 for sampling guidelines and sampling participation notes †, ‡, and ≡.

‡ Reservations about reliability because the percentage of students with achievement too low for estimation exceeds 15% but does not exceed 25%.

JK Average achievement not reliably measured because the percentage of students with achievement too low for estimation exceeds 25%.

■ Difference statistically significant ($p < 0.05$)

■ Difference not statistically significant

SOURCE: IEA's Trends in International Mathematics and Science Study - TIMSS 2023
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Grade 4 International Benchmarks of Science Achievement

International Benchmarks of Grade 4 Science Achievement

To understand what students at different points on the TIMSS achievement scale know and can do, it is important to examine the types of tasks students at certain defined points on the TIMSS achievement scale are likely to solve. For example, in terms of students' science skills, if a group of students has an average achievement of 550, what do these students know and what can they do, compared to students with an average achievement of 400? Looking at the proportion of students who can solve the TIMSS science items can help countries determine whether students at different levels along the scale have gained the science knowledge and practices covered in the science curriculum.

To provide more information about the range of achievement students show in the TIMSS fourth-grade science assessment, TIMSS reports percentages of students reaching four increasingly challenging points along the achievement scale, known as International Benchmarks: Low International Benchmark (400 scale score points), Intermediate International Benchmark (475), High International Benchmark (550), and Advanced International Benchmark (625). The TIMSS International Benchmarks build on each other, representing increasingly demanding science knowledge and skills with each higher benchmark. The students who reach a higher benchmark have also surpassed all lower benchmarks. For example, students who reached the Advanced Benchmark also surpassed the High, Intermediate, and Low Benchmarks.

Descriptions for each International Benchmark provide an interpretation of the achievement scale in relation to students' performance on the assessment items. For TIMSS 2023, the descriptions of science achievement at the International Benchmarks were updated from TIMSS 2019 based on a review and analysis of the items that students with average achievement at or above each of the benchmarks were likely to solve in TIMSS 2023 (see Chapter 14 in the *TIMSS 2023 Technical Report*).

Exhibit 2.1.3: Summary of TIMSS 2023 International Benchmarks of Science Achievement

	Advanced International Benchmark
625	<i>Students can show, apply, and communicate their knowledge of life, physical, and earth sciences, and engage in multiple scientific inquiry practices.</i> Students show knowledge of the characteristics of living things, and they can construct and reason with representations of the relationships among organisms in ecosystems. They demonstrate knowledge of inheritance, killing germs, and environmental pollution. They show knowledge of properties of matter and of changes in states of matter, and they reason about dissolving rates in a laboratory setting. Students can communicate their understanding of Earth's physical characteristics and processes and of how humans use and impact the Earth's natural resources. They show knowledge of the motion and relative position of the Earth, Moon, and Sun. Students can design fair tests, predict outcomes, and evaluate possible conclusions.
	High International Benchmark
550	<i>Students show and apply knowledge of life, physical, and earth science, and they engage in some scientific inquiry practices.</i> They can distinguish between living and nonliving things, they show knowledge about plant and animal reproduction and survival, and they can apply knowledge about some of the characteristics of plants and animals and their life cycles. Students can apply knowledge about the spread of germs. They can apply knowledge about states and properties of matter, magnets, sound, and heat and can reason using knowledge of dissolving rates in an everyday context. They show and can apply some knowledge of forces and motion. Students know various facts about the Earth's physical characteristics, and they apply their knowledge about Earth's different climates and changes over time. They can apply knowledge of the Earth-Sun system, and they show basic knowledge of the Moon's phases. Students describe observations and interpret models and graphical representations.
	Intermediate International Benchmark
475	<i>Students show and apply knowledge of some scientific concepts.</i> Students show and apply some knowledge about plants and animals, and they have basic knowledge of human health. They show knowledge about properties of matter, energy, and light, and they apply basic knowledge about forces and motion. They show basic understanding of the Earth's surface. Students can provide partial descriptions of observations, and they can relate observations and data to scientific facts.
	Low International Benchmark
400	<i>Students show knowledge of some science facts.</i> They demonstrate basic knowledge of plants, animals, and the environment. They show knowledge about some properties of matter in everyday situations, and they know that turbines provide electricity to some regions. They show some knowledge about Earth's characteristics, its changes over time, and its climate.

SOURCE: IEA's Trends in International Mathematics and Science Study - TIMSS 2023
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○ Low International Benchmark	
400	Summary Students show knowledge of some science facts. They demonstrate basic knowledge of plants, animals, and the environment. They show knowledge about some properties of matter in everyday situations, and they know that turbines provide electricity to some regions. They show some knowledge about Earth's characteristics, its changes over time, and its climate. Students show partial knowledge about the needs of living things to live and grow and about the life cycle stages of a common plant. They can classify common animals into major groups and match them to their habitats. They can classify human activities as harmful or helpful to the environment. Students show limited knowledge of physics and chemistry in everyday contexts. They can recognize everyday objects that can rust, conduct heat, or are attracted to a magnet, and understand one property of water. Students demonstrate an understanding that turbines provide electricity to some regions. Students know where salt water is found, that the Earth's climate is hot and dry near the equator, and how increasing global temperature affects deserts and ice caps. Students can recognize that wind can change the location of sand dunes.

SOURCE: IEA's Trends in International Mathematics and Science Study - TIMSS 2023
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Exhibit 2.1.5a: TIMSS 2023 Low International Benchmark (400) of Science Achievement – Example Item 1**Content Domain:** Physical Science**Cognitive Domain:** Applying**Description:** Identifies the most likely material making up a spoon that gets hot sitting in a pot of boiling soup

Jenny stirs a pot of boiling soup and leaves her spoon in the pot.

Later, the spoon is too hot to pick up.

What material is the spoon most likely made from?

- ☐ A wood
- ☐ B rubber
- ☐ C plastic
- ☒ D metal

SOURCE: IEA's Trends in International Mathematics and Science Study - TIMSS 2023
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Exhibit 2.1.5b: TIMSS 2023 Low International Benchmark (400) of Science Achievement – Example Item 2

Content Domain: Earth Science

Cognitive Domain: Knowing

Description: Identifies natural resources used to grow plants

Harriet has a small vegetable garden.



Which natural resources does Harriet use to grow plants?

- ☒ A water and soil
- ☐ B water and wind
- ☐ C soil and oil
- ☐ D oil and wind

SOURCE: IEA's Trends in International Mathematics and Science Study - TIMSS 2023
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Exhibit 2.1.6: Description of the TIMSS 2023 Intermediate International Benchmark (475) of Science Achievement



Intermediate International Benchmark

475

Summary

Students show and apply knowledge of some scientific concepts. Students show and apply some knowledge about plants and animals, and they have basic knowledge of human health. They show knowledge about properties of matter, energy, and light, and they apply basic knowledge about forces and motion. They show basic understanding of the Earth's surface. Students can provide partial descriptions of observations, and they can relate observations and data to scientific facts.

Students can apply knowledge about some physical features and behaviors of living things, as well as their needs to live, grow, and survive. They can identify animals as predators or prey and show knowledge of part of the life cycle of a common animal. They can describe why plastic objects are dangerous for sea animals. Students have some basic knowledge about the role of one type of food in a balanced diet and about germs and avoiding illness.

Students can recognize materials in the three states of matter and solid materials that can conduct heat, conduct electricity, and are attracted to a magnet. They can describe one way to increase how quickly a common solid dissolves in water. They demonstrate knowledge of simple electrical circuits, energy sources, and transformation of energy in a common device. Students can reason about the formation of shadows. They can apply basic knowledge of forces and motion in everyday contexts, and they know that gravity pulls things down.

Students can recognize that most of the Earth's surface is covered by salt water.

Students can partially describe observations and relate observations and data to basic scientific facts.

SOURCE: IEA's Trends in International Mathematics and Science Study - TIMSS 2023
Downloaded from <https://timss2023.org/results>



TIMSS & PIRLS
BOSTON COLLEGE

Exhibit 2.1.6a: TIMSS 2023 Intermediate International Benchmark (475) of Science Achievement – Example Item 1**Content Domain:** Life Science**Cognitive Domain:** Applying**Description:** Explains why a plant kept by a window is healthier than a plant kept in a closed closet

John investigated the effect of different amounts of light on two identical plants.

He put the plants in identical pots with the same kind of soil and the same amount of water.

John put Plant A near the window and put Plant B inside a closet with the door closed.

After two weeks, the plants looked like this:



Why is Plant B that was kept in the closet less healthy than Plant A that was kept by the window?

A is healthy because it had light

The answer shown illustrates one type of response that would receive full credit.
Other types of correct responses are possible as defined by the item's unique scoring guide.

Exhibit 2.1.6b: TIMSS 2023 Intermediate International Benchmark (475) of Science Achievement – Example Item 2

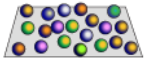
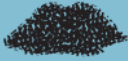
Content Domain: Physical Science

Cognitive Domain: Knowing

Description: Identifies which of six objects can be picked up using a magnet

Joseph has several piles of objects to pick up. Which objects can he pick up using a magnet?

Click **all** the sets of objects that Joseph could pick up using a magnet.

 glass marbles	 iron filings	 rubber bands
 steel paperclips	 wooden toothpicks	 disk magnets

SOURCE: IEA's Trends in International Mathematics and Science Study - TIMSS 2023
Downloaded from <https://timss2023.org/results>

Exhibit 2.1.7: Description of the TIMSS 2023 High International Benchmark (550) of Science Achievement



High International Benchmark

550 Summary

Students show and apply knowledge of life, physical, and earth science, and they engage in some scientific inquiry practices. They can distinguish between living and nonliving things, they show knowledge about plant and animal reproduction and survival, and they can apply knowledge about some of the characteristics of plants and animals and their life cycles. Students can apply knowledge about the spread of germs. They can apply knowledge about states and properties of matter, magnets, sound, and heat and can reason using knowledge of dissolving rates in an everyday context. They show and can apply some knowledge of forces and motion. Students know various facts about the Earth's physical characteristics, and they apply their knowledge about Earth's different climates and changes over time. They can apply knowledge of the Earth-Sun system, and they show basic knowledge of the Moon's phases. Students describe observations and interpret models and graphical representations.

Students can distinguish between living and nonliving things, and they identify the distinguishing characteristics of major animal groups. They tend to know the function of major structures in living things and reason about some of their characteristics. Students can apply knowledge about the complete life cycles of common plants and animals. They can complete food chains and recognize that plants produce their own food. They can recognize that two adult animals of the opposite sex can reproduce, and that plant offspring resemble their parent plant. Students can relate animals' physical features and behaviors to the success of their survival in a given environment. Students apply knowledge about how germs spread to a given situation.

Students can apply basic knowledge about changes in states of matter, magnets, sound production, and heat conduction. They can reason with the knowledge that size affects how quickly a common solid dissolves in water and about concentration in an everyday context. They can recognize how a simple machine makes motion easier. Students can identify air resistance and friction and apply knowledge about the direction of forces in various contexts. They can identify forms of energy in a simple electrical circuit.

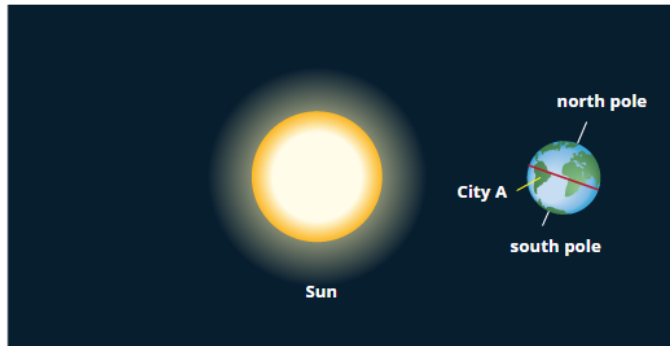
Students show knowledge of the ratio of land area to water area covering Earth's surface and they can apply their knowledge about temperature and rainfall in tropical and desert climates. They can make deductions about changes over time in Earth's surface and in animal remains from observations. Students show basic knowledge about the phases of the Moon and Earth's position in the solar system, and they can apply knowledge of the Earth-Sun system to recognize daytime and the seasons.

Students can describe a contrast from observations and interpret models and quantitative information in different graphical representations.

SOURCE: IEA's Trends in International Mathematics and Science Study - TIMSS 2023
Downloaded from <https://timss2023.org/results>

Content Domain: Earth Science**Cognitive Domain:** Applying**Description:** Interprets a diagram of the Sun and the Earth to identify the season in a labeled city

The diagram shows the Earth orbiting the Sun.



What season is it in City A in this diagram?

- ☐ A winter
- ☐ B spring
- ☒ C summer
- ☐ D autumn

SOURCE: IEA's Trends in International Mathematics and Science Study - TIMSS 2023
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IEA TIMSS & PIRLS
BOSTON COLLEGE

Content Domain: Life Science

Cognitive Domain: Knowing

Description: Describes how germs can still spread if a person covers their mouth with their hands when they cough



George has a cold. He coughs into his hands to help stop spreading germs to his sister.

How could germs from George's cough still spread to his sister?

If George touches his sister, he will get his germs on her

The answer shown illustrates one type of response that would receive full credit.
Other types of correct responses are possible as defined by the item's unique scoring guide.

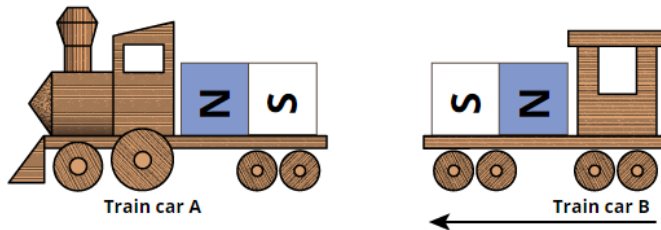
Exhibit 2.1.8: Description of the TIMSS 2023 Advanced International Benchmark (625) of Science Achievement

 Advanced International Benchmark
625 Summary <i>Students can show, apply, and communicate their knowledge of life, physical, and earth sciences, and engage in multiple scientific inquiry practices. Students show knowledge of the characteristics of living things, and they can construct and reason with representations of the relationships among organisms in ecosystems. They demonstrate knowledge of inheritance, killing germs, and environmental pollution. They show knowledge of properties of matter and of changes in states of matter, and they reason about dissolving rates in a laboratory setting. Students can communicate their understanding of Earth's physical characteristics and processes and of how humans use and impact the Earth's natural resources. They show knowledge of the motion and relative position of the Earth, Moon, and Sun. Students can design fair tests, predict outcomes, and evaluate possible conclusions.</i> Students can recognize that both plants and animals require energy to grow. They can construct a food chain, interpret food webs, and reason about competition and population changes in ecosystems. They can identify traits that are inherited and those that are not inherited, and they can identify the effect of pollution on crops. Students tend to know that boiling water kills germs. Students show knowledge of the properties of a liquid and recognize that no new materials are formed during a change of state. They can reason about concentration in a laboratory setting and they describe two ways to increase how quickly a common solid dissolves in water. Students can describe how humans use river water as a natural resource for farming and distinguish renewable from nonrenewable energy sources. They can recognize that wind and water change the shape of rocks over time and that water in a puddle evaporates. They show knowledge about the relative position and motion of the Sun, Moon, and Earth, and they state the motion that results in day and night. Students can predict the outcome of an experiment, can design fair tests in different science content domains, and can evaluate possible conclusions from an investigation.

SOURCE: IEA's Trends in International Mathematics and Science Study - TIMSS 2023
Downloaded from <https://timss2023.org/results>

Content Domain: Physical Science**Cognitive Domain:** Applying**Description:** Predicts how a train car with a magnet attached will move when another train car with a magnet attached is brought towards it

The picture shows two toy train cars carrying magnets.



Ahmad moves Train car B toward Train car A.

What will happen to Train car A?

(Click one box.)

- ☒ Train car A will move away from Train car B.
- ☐ Train car A will move toward Train car B.

Explain your answer.

Like poles repel

The answer shown illustrates one type of response that would receive full credit.
Other types of correct responses are possible as defined by the item's unique scoring guide.

Content Domain: Physical Science**Cognitive Domain:** Applying**Description:** Identifies a statement describing the change that occurs when water boils

Water is heated in a metal pot and begins to boil.

Carla says that new materials are being created because the water is bubbling.

Is Carla correct?

- ☐ A Yes, the hot metal in the pot is releasing a gas.
- ☐ B Yes, the hot metal and hot water mix and release a gas.
- ☒ C No, the hot water is turning into a gas.
- ☐ D No, the air near the pot is mixing into the water.

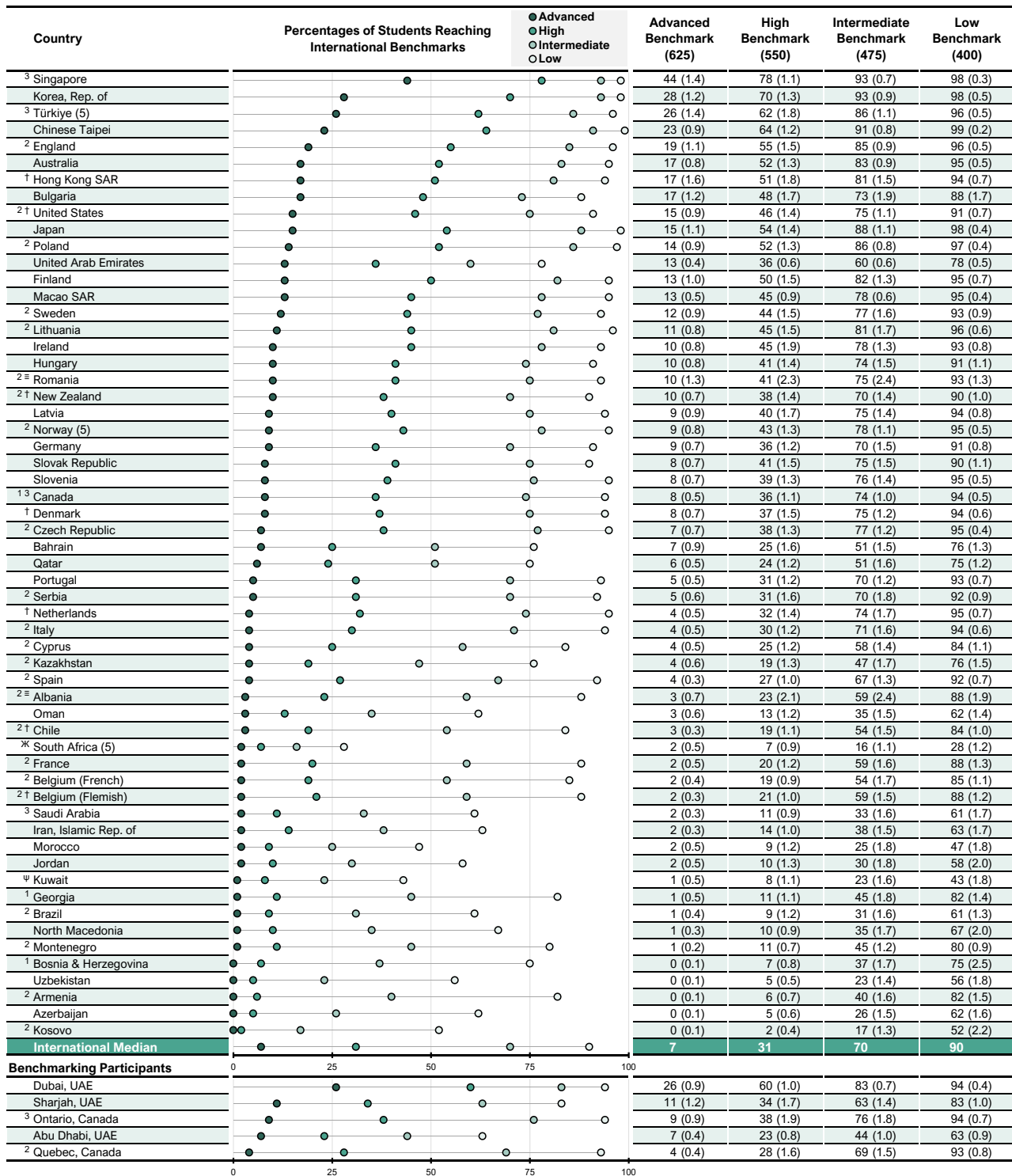
Percentages of Students Reaching International Benchmarks of Science Achievement (Grade 4)

Exhibit 2.1.4 provides graphical and numerical representations of the percentages of fourth-grade students reaching each TIMSS 2023 International Benchmark in participating countries and benchmarking entities. The International Benchmarks function like steps on a ladder: If students reached a higher benchmark, they also reached each of the lower benchmarks. The percentages do not add up to 100%, but rather indicate cumulative proportions: The lower the benchmark, the higher the proportion of students reaching that benchmark. Conversely, the higher the benchmark, the lower the proportion of students reaching it. The exhibit also provides the standard error (in parentheses) associated with each of the estimated percentages.

As a point of reference, the exhibit reports the international median of the percentage of students reaching each International Benchmark across participating countries, instead of an average as is displayed in other report exhibits for average achievement. By definition, half of the countries will have a percentage in the column above the median and half will be below the median.

Across the 58 countries, the median percentages of fourth-grade students reaching each International Benchmark in TIMSS 2023 were 7 percent at Advanced, 31 percent at High, 70 percent at Intermediate, and 90 percent at Low. The percentage reaching the Advanced Benchmark ranged from 44 percent to 0 percent, with four countries having more than 20 percent of students reaching this level. The percentage of students reaching the Low Benchmark ranged from over 99 percent to 28 percent. In 29 TIMSS 2023 countries, more than 90 percent of fourth-grade students internationally reached the Low Benchmark, which can be considered a level of minimum science proficiency. The exhibit allows sorting by percentage of students reaching each International Benchmark and selecting groups of countries, facilitating the examination of relative differences in the percentages of students reaching the different levels of proficiency described by the TIMSS 2023 International Benchmarks.

Exhibit 2.1.4: Percentages of Students Reaching the TIMSS International Benchmarks of Science Achievement



() Standard errors appear in parentheses. Because of rounding some results may appear inconsistent.

See Appendix B.2 for population coverage notes 1, 2, and 3. See Appendix B.5 for sampling guidelines and sampling participation notes †, ‡, and =.

Ψ Reservations about reliability because the percentage of students with achievement too low for estimation exceeds 15% but does not exceed 25%.

✕ Average achievement not reliably measured because the percentage of students with achievement too low for estimation exceeds 25%.

Grade 4 Trends in Science Achievement

Trends in Science Achievement (Grade 4)

The eighth-grade TIMSS science achievement scale was established in TIMSS 1995, based on the achievement across all participating countries. In 1995, the international mean was set to 500, and the international standard deviation was set to 100, providing the origin of the TIMSS trend scale. Students' achievement was placed on the same scale with each subsequent TIMSS cycle, most recently for TIMSS 2023. Reporting the achievement data from each TIMSS assessment on the TIMSS trend scale enables monitoring increases or decreases in achievement across assessment cycles.

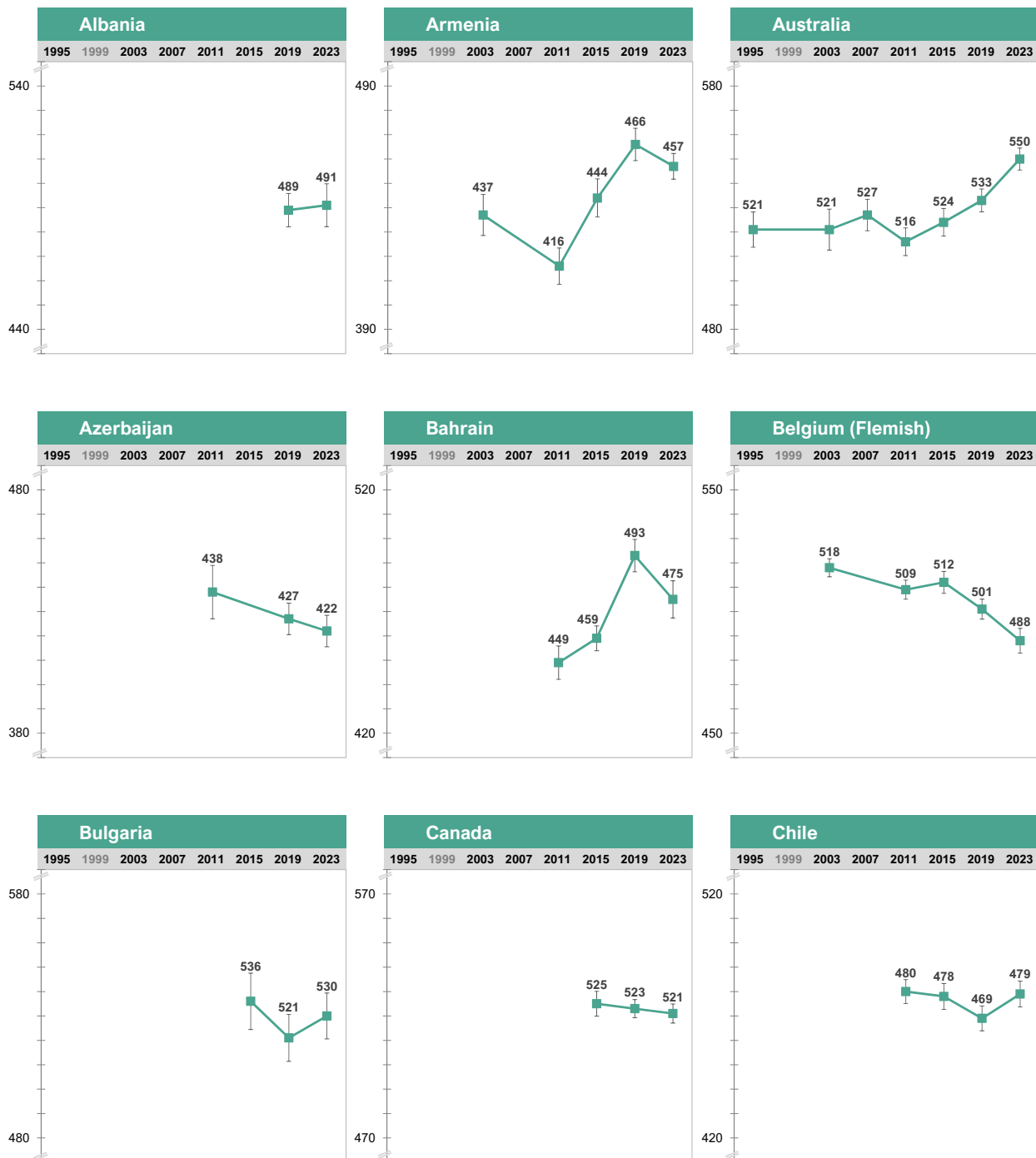
Exhibit 2.2.9 displays changes in achievement across assessment years for the countries and benchmarking participants that have participated in prior cycles of TIMSS. The trend graphs include a graphical representation of the 95% confidence interval around each cycle mean, depicted as small error bars above and below the average achievement estimate. Confidence intervals of this width around the sample mean have a 95% probability to include the true country average under repeated sampling. Users can select individual countries, groups of countries, or all countries that participated for customized displays of trends.

Across the (up to) 8 time points spanning the years from 1995 to 2023, many countries that participated multiple times have had some periods of increases or decreases in average achievement as well as periods of stability. It can be seen that even if estimates of average achievement may be lower or higher for adjacent years, the confidence intervals overlap quite frequently. In cases of larger differences with little or no overlap of confidence intervals, the trends over time indicate more noticeable changes of larger magnitude.

Exhibit 2.2.10 extends the results of Exhibit 2.2.9, providing more detail about the achievement distributions across assessment cycles and the differences in average achievement between each previous TIMSS cycle and TIMSS 2023. Symbols are used to indicate if an estimate obtained in a prior TIMSS cycle shows a statistically significant difference compared to TIMSS 2023. The direction of the up or down arrow shows whether the previous estimate is higher or lower than the estimate obtained in 2023. For the 34 countries with comparable data in TIMSS 2019, 3 showed an increase in average science achievement, 15 showed a decrease, and 16 had no change. Confidence intervals for the average achievement of each cycle are reported, corresponding to the error bars in the trend graphs in Exhibit 2.2.9. The graphical depiction of the percentiles provides a visualization of the distribution and shows the range of achievement that is observed in each cycle. The overlap of these visual representations of achievement distributions provides a reference for the magnitude of changes observed across TIMSS cycles.

Exhibit 2.1.9: Trend Plots of Average Science Achievement[◇]

This exhibit displays changes in achievement across assessment years for the countries and benchmarking participants that have comparable data from previous TIMSS assessments. The accompanying table (Exhibit 2.1.10) provides details. The scale interval is 10 points for each country, but a different part of the scale is shown according to each country's average achievement. See Appendix A for country participation in previous assessments.



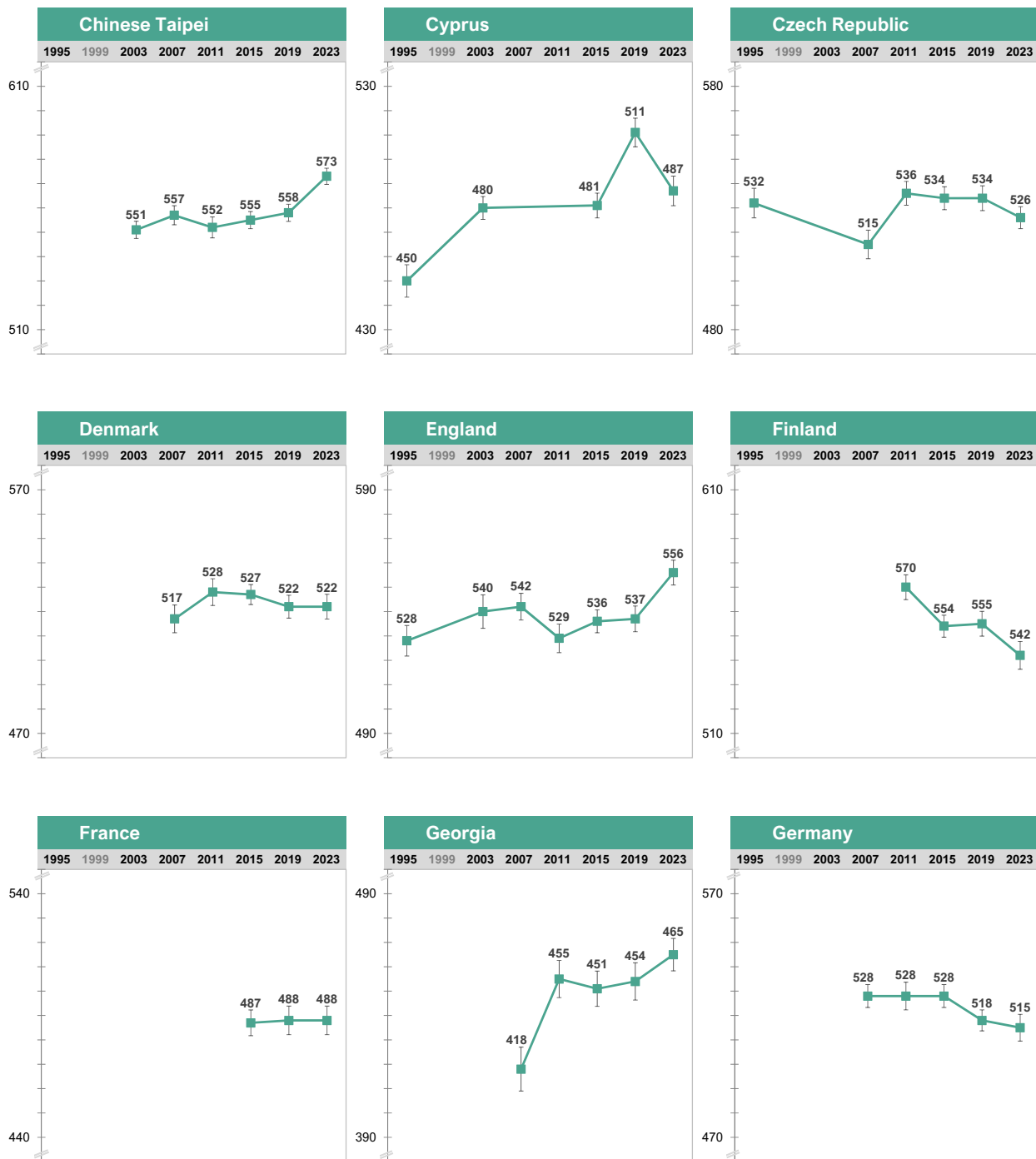
◇ There was no TIMSS fourth grade assessment in 1999. See Appendix A for country participation in previous TIMSS assessments.
 The scale interval is 10 points for each country, but a different part of the scale is shown according to each country's average achievement.
 I The black bars represent the 95% confidence interval.

SOURCE: IEA's Trends in International Mathematics and Science Study - TIMSS 2023
 Downloaded from <https://timss2023.org/results>

Exhibit 2.1.9: Trend Plots of Average Science Achievement⁰

(Continued)

This exhibit displays changes in achievement across assessment years for the countries and benchmarking participants that have comparable data from previous TIMSS assessments. The accompanying table (Exhibit 2.1.10) provides details. The scale interval is 10 points for each country, but a different part of the scale is shown according to each country's average achievement. See Appendix A for country participation in previous assessments.



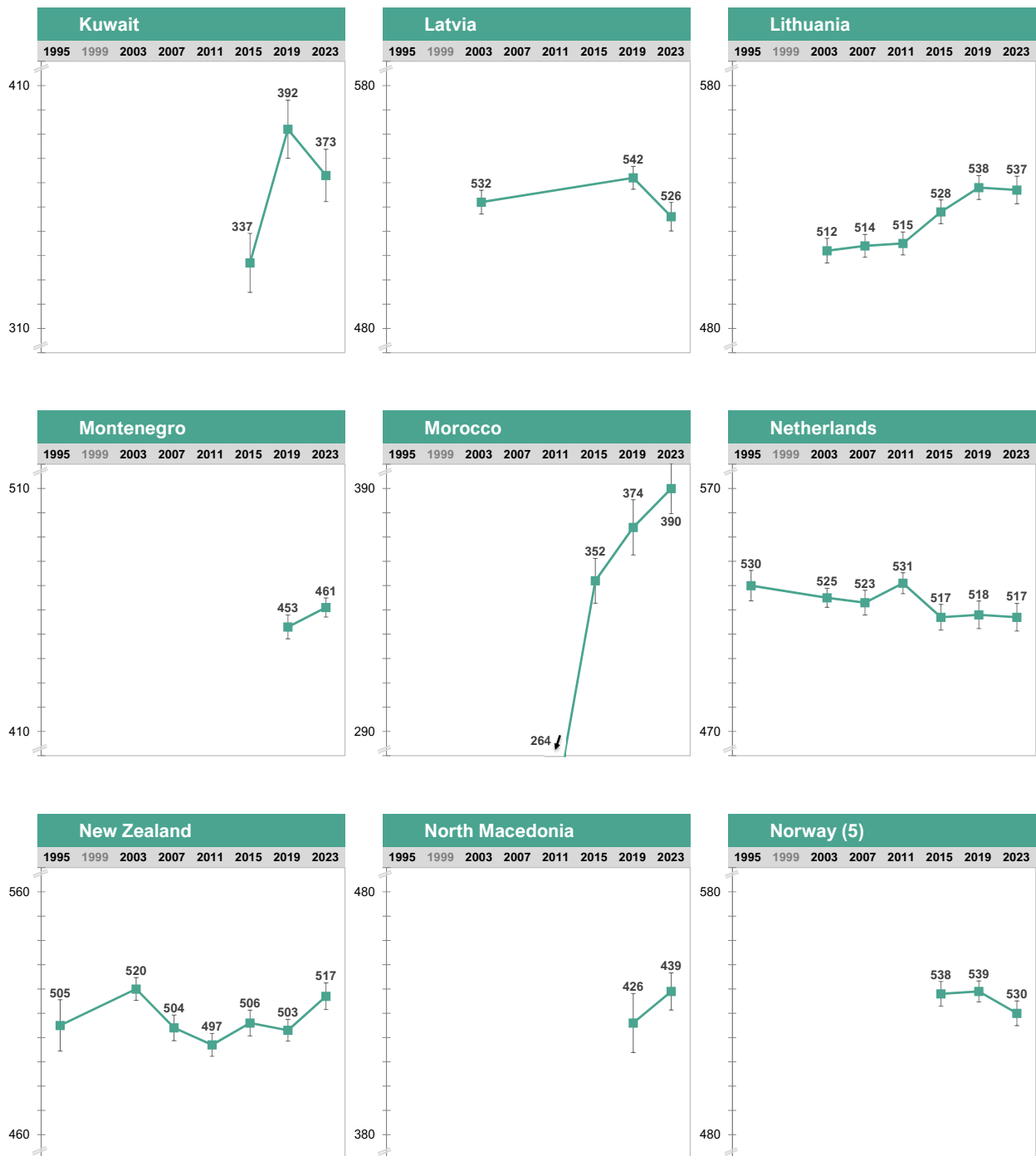
⁰ There was no TIMSS fourth grade assessment in 1999. See Appendix A for country participation in previous TIMSS assessments.
 The scale interval is 10 points for each country, but a different part of the scale is shown according to each country's average achievement.
 I The black bars represent the 95% confidence interval.

SOURCE: IEA's Trends in International Mathematics and Science Study - TIMSS 2023
 Downloaded from <https://timss2023.org/results>

Exhibit 2.1.9: Trend Plots of Average Science Achievement⁰

(Continued)

This exhibit displays changes in achievement across assessment years for the countries and benchmarking participants that have comparable data from previous TIMSS assessments. The accompanying table (Exhibit 2.1.10) provides details. The scale interval is 10 points for each country, but a different part of the scale is shown according to each country's average achievement. See Appendix A for country participation in previous assessments.



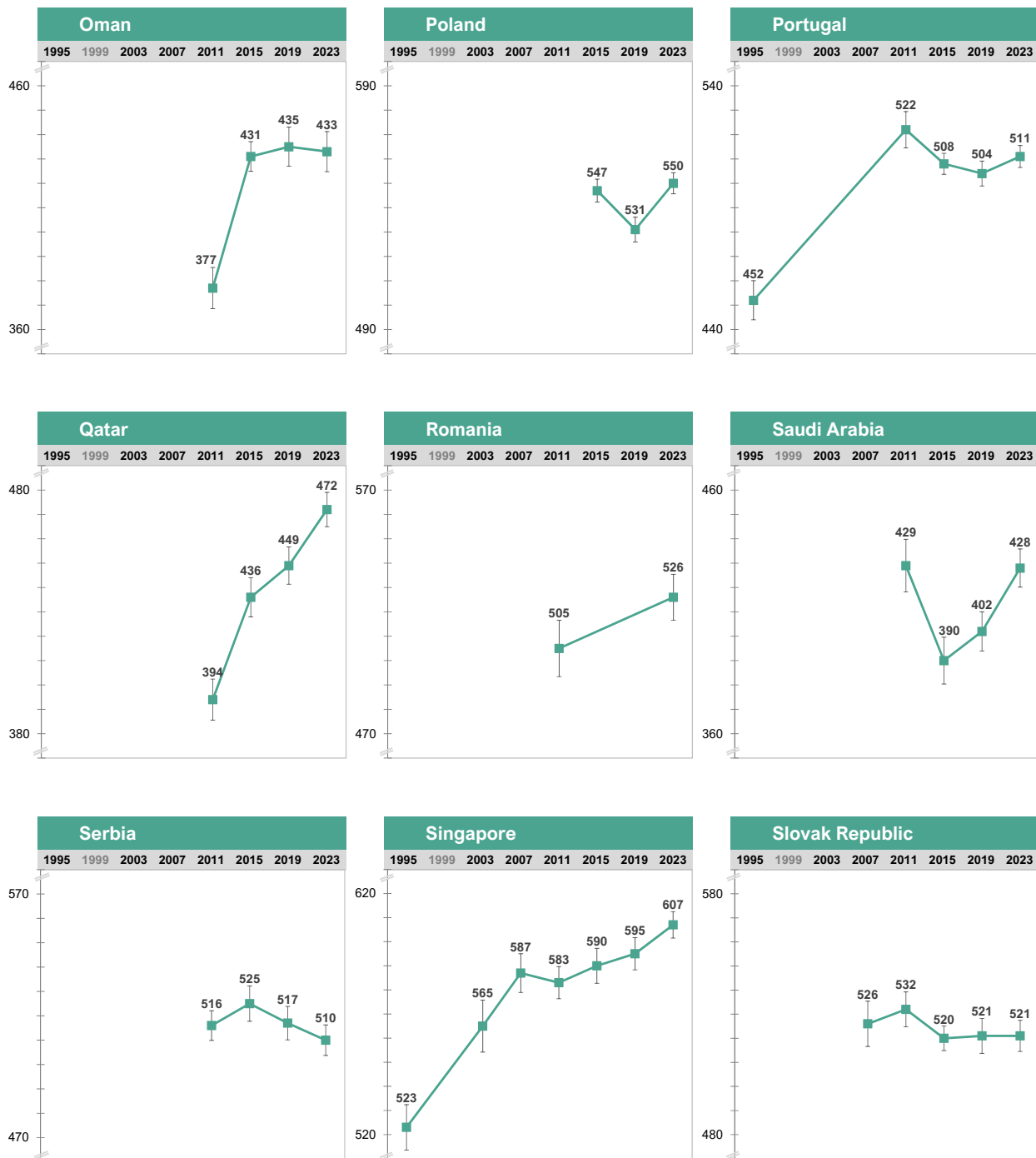
⁰ There was no TIMSS fourth grade assessment in 1999. See Appendix A for country participation in previous TIMSS assessments.
 The scale interval is 10 points for each country, but a different part of the scale is shown according to each country's average achievement.
 I The black bars represent the 95% confidence interval.

SOURCE: IEA's Trends in International Mathematics and Science Study - TIMSS 2023
 Downloaded from <https://timss2023.org/results>

Exhibit 2.1.9: Trend Plots of Average Science Achievement[◇]

(Continued)

This exhibit displays changes in achievement across assessment years for the countries and benchmarking participants that have comparable data from previous TIMSS assessments. The accompanying table (Exhibit 2.1.10) provides details. The scale interval is 10 points for each country, but a different part of the scale is shown according to each country's average achievement. See Appendix A for country participation in previous assessments.



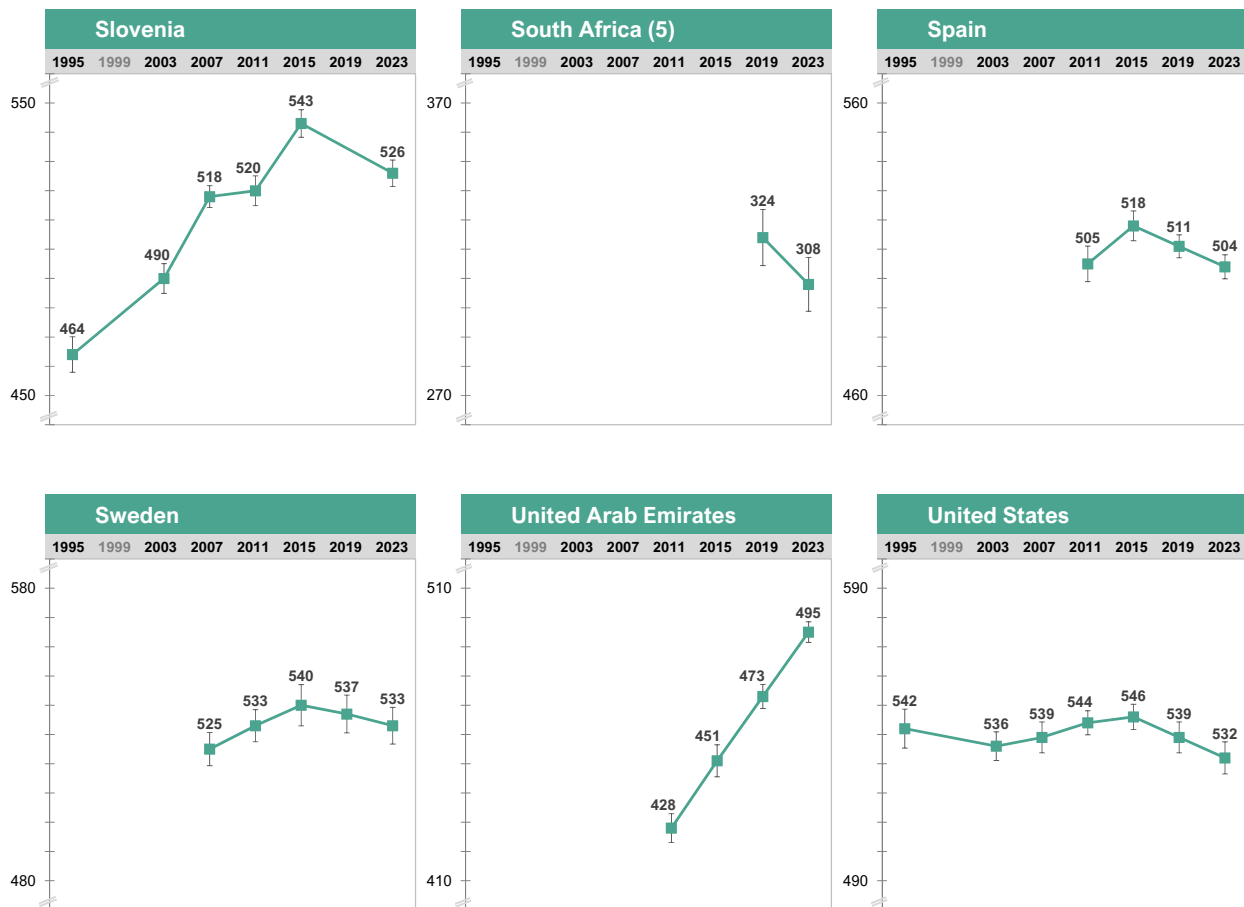
◇ There was no TIMSS fourth grade assessment in 1999. See Appendix A for country participation in previous TIMSS assessments.
 The scale interval is 10 points for each country, but a different part of the scale is shown according to each country's average achievement.
 I The black bars represent the 95% confidence interval.

SOURCE: IEA's Trends in International Mathematics and Science Study - TIMSS 2023
 Downloaded from <https://timss2023.org/results>

Exhibit 2.1.9: Trend Plots of Average Science Achievement[◇]

(Continued)

This exhibit displays changes in achievement across assessment years for the countries and benchmarking participants that have comparable data from previous TIMSS assessments. The accompanying table (Exhibit 2.1.10) provides details. The scale interval is 10 points for each country, but a different part of the scale is shown according to each country's average achievement. See Appendix A for country participation in previous assessments.



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 The scale interval is 10 points for each country, but a different part of the scale is shown according to each country's average achievement.
 I The black bars represent the 95% confidence interval.

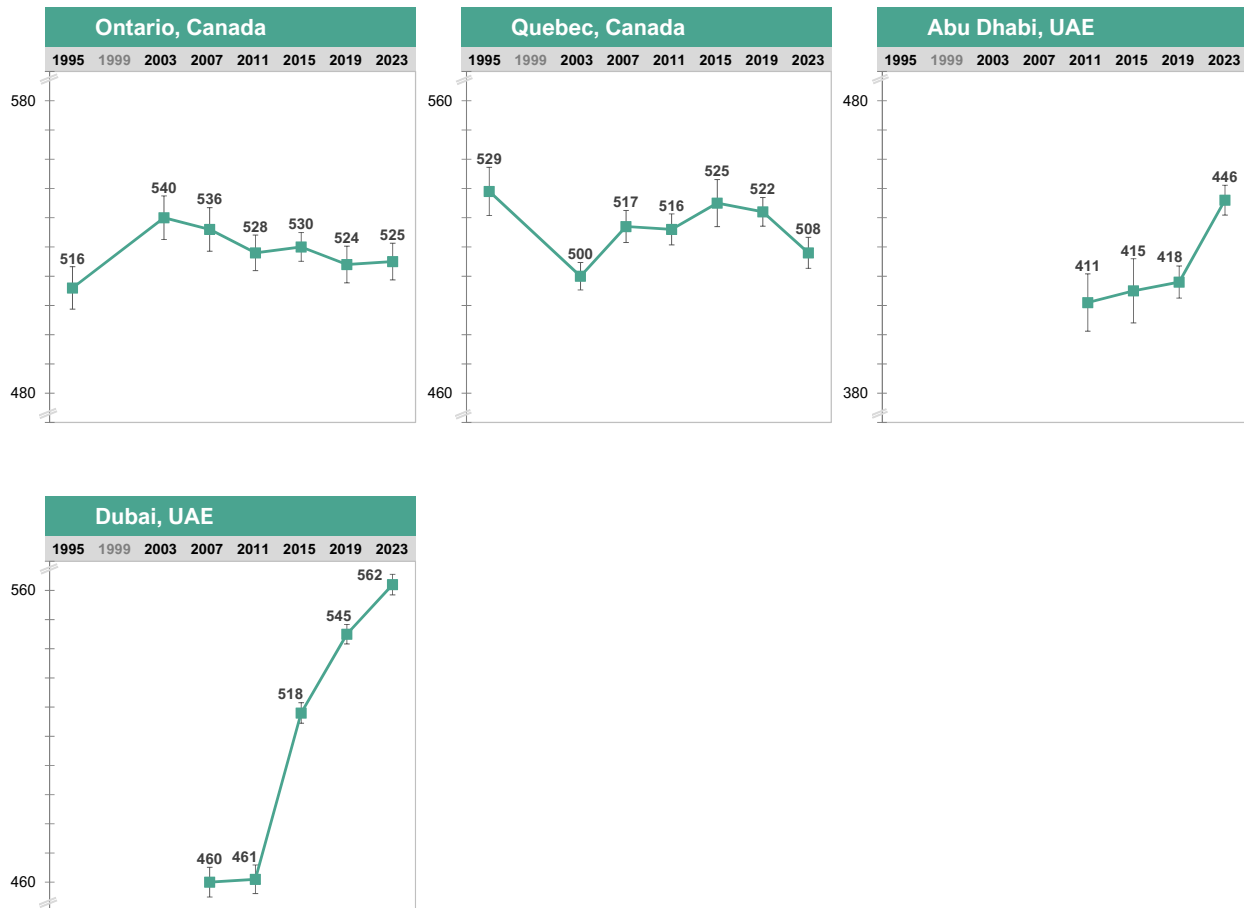
SOURCE: IEA's Trends in International Mathematics and Science Study - TIMSS 2023
 Downloaded from <https://timss2023.org/results>

Exhibit 2.1.9: Trend Plots of Average Science Achievement[◇]

(Continued)

This exhibit displays changes in achievement across assessment years for the countries and benchmarking participants that have comparable data from previous TIMSS assessments. The accompanying table (Exhibit 2.1.10) provides details. The scale interval is 10 points for each country, but a different part of the scale is shown according to each country's average achievement. See Appendix A for country participation in previous assessments.

Benchmarking Participants

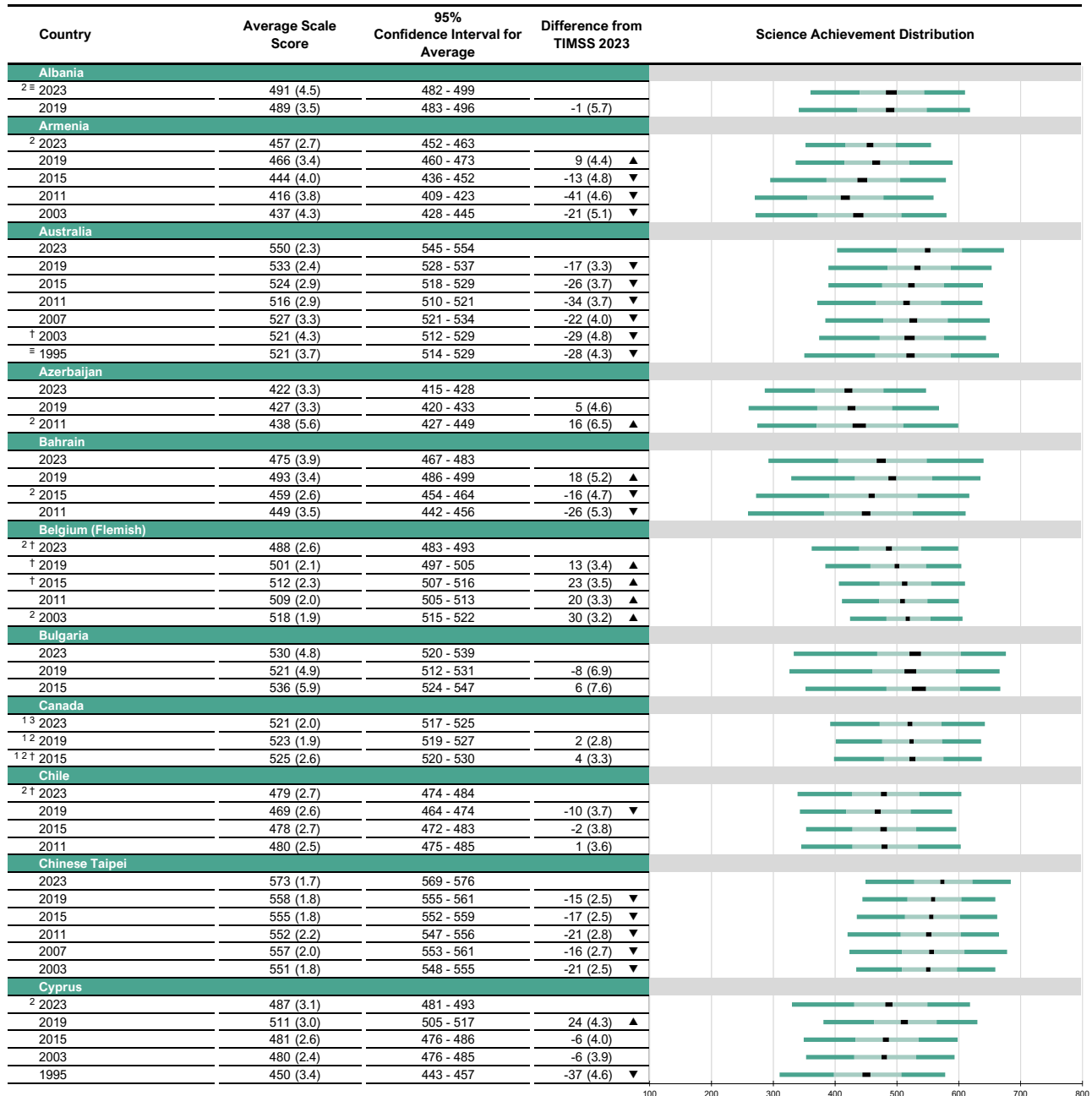


◇ There was no TIMSS fourth grade assessment in 1999. See Appendix A for country participation in previous TIMSS assessments.
 The scale interval is 10 points for each country, but a different part of the scale is shown according to each country's average achievement.
 I The black bars represent the 95% confidence interval.

SOURCE: IEA's Trends in International Mathematics and Science Study - TIMSS 2023
 Downloaded from <https://timss2023.org/results>

Exhibit 2.1.10: Trends in Average Science Achievement and Scale Score Distributions

This exhibit reports differences in achievement across assessment years for the countries and benchmarking participants that have comparable data from previous TIMSS assessments. Symbols indicate if the row year is significantly higher (▲) or significantly lower (▼) than the performance in TIMSS 2023. See Appendix A for country participation in previous TIMSS assessments.



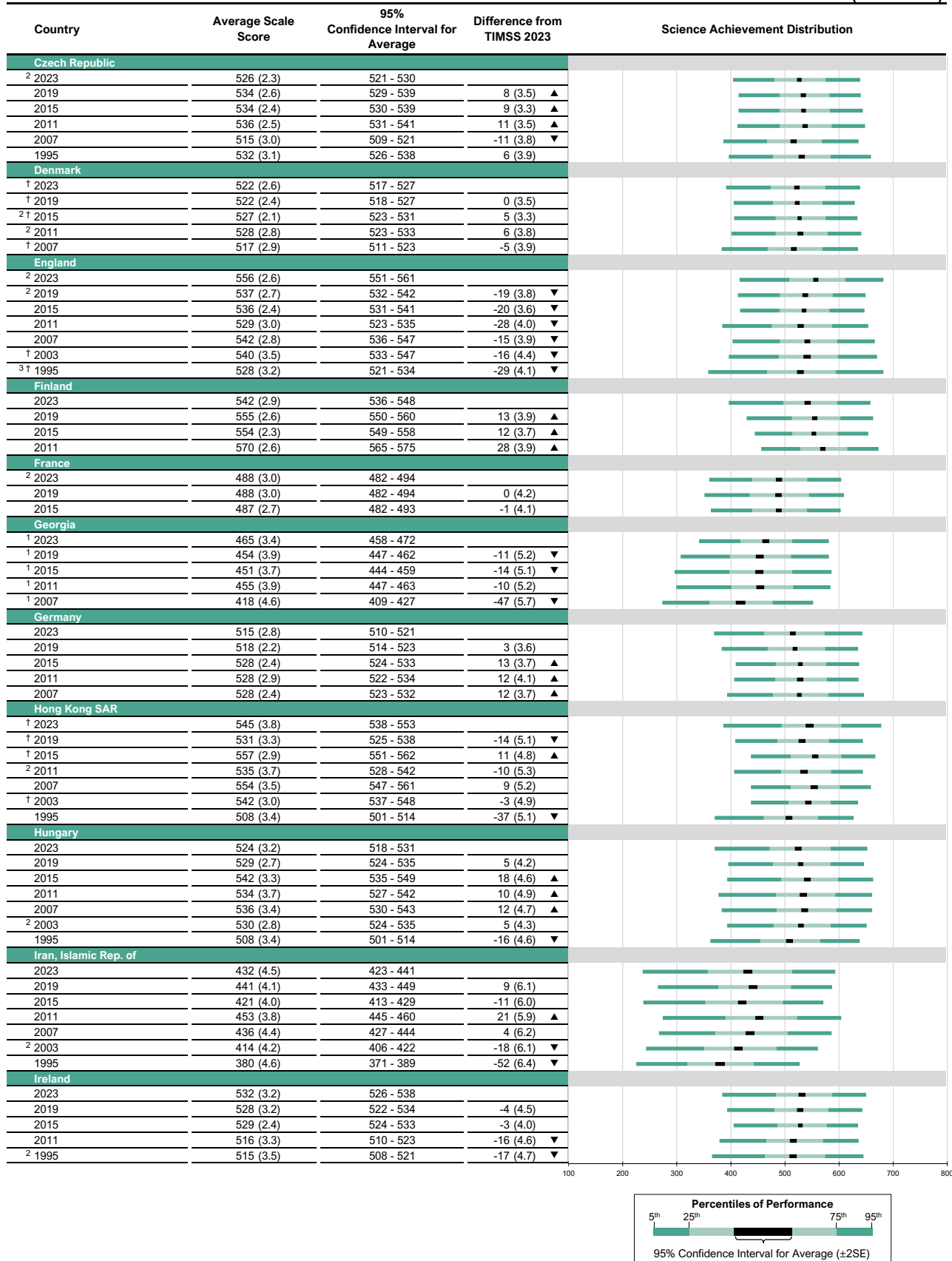
See Appendix A for country participation in previous TIMSS assessments.

() Standard errors appear in parentheses. Because of rounding some results may appear inconsistent.

See Appendix B.2 for population coverage notes 1, 2, and 3. See Appendix B.5 for sampling guidelines and sampling participation notes †, ‡, and ≡.

Exhibit 2.1.10: Trends in Average Science Achievement and Scale Score Distributions

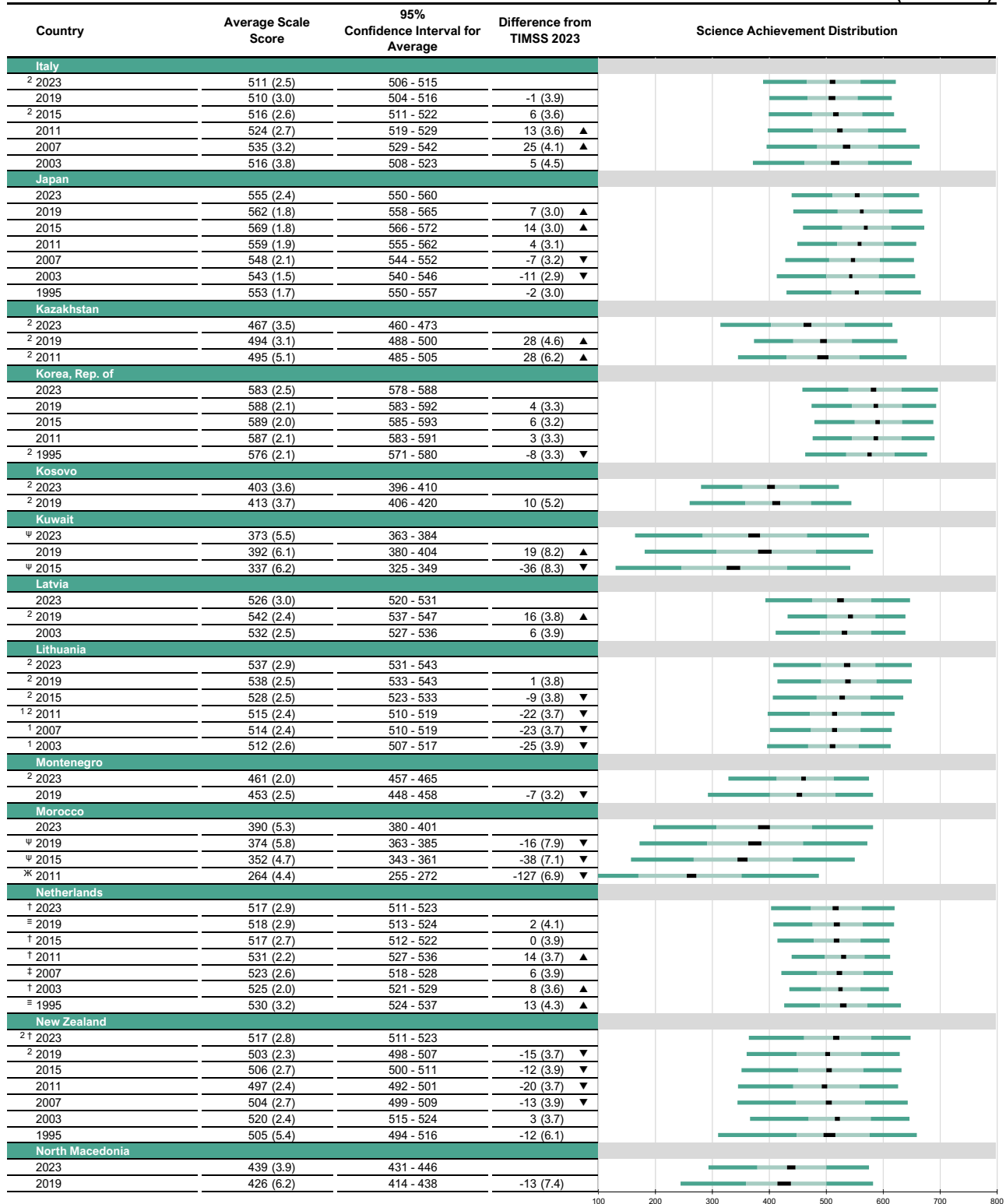
(Continued)



SOURCE: IEA's Trends in International Mathematics and Science Study - TIMSS 2023
Downloaded from <https://timss2023.org/results>

Exhibit 2.1.10: Trends in Average Science Achievement and Scale Score Distributions

(Continued)



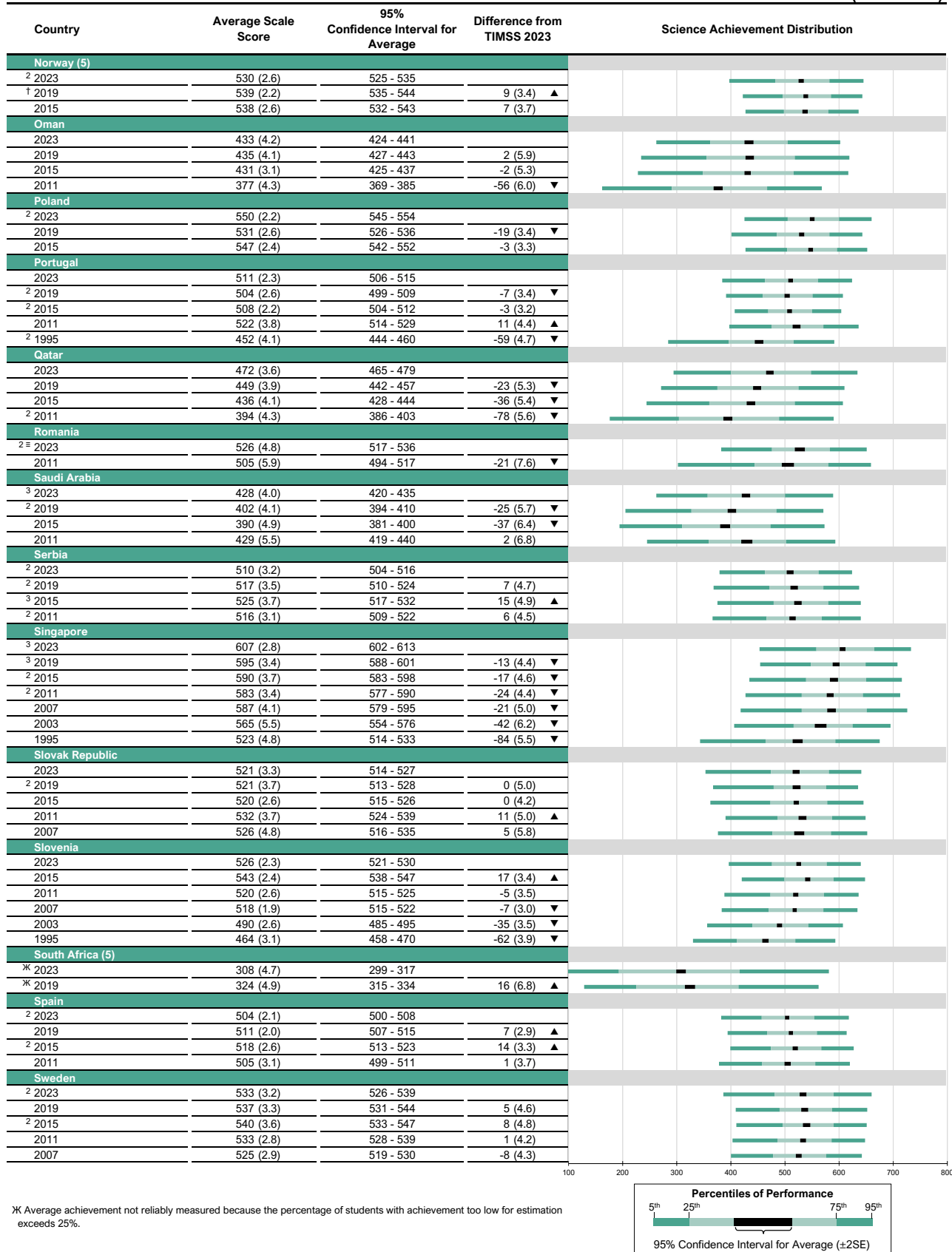
^ψ Reservations about reliability because the percentage of students with achievement too low for estimation exceeds 15% but does not exceed 25%.

[✱] Average achievement not reliably measured because the percentage of students with achievement too low for estimation exceeds 25%.

SOURCE: IEA's Trends in International Mathematics and Science Study - TIMSS 2023
Downloaded from <https://timss2023.org/results>

Exhibit 2.1.10: Trends in Average Science Achievement and Scale Score Distributions

(Continued)

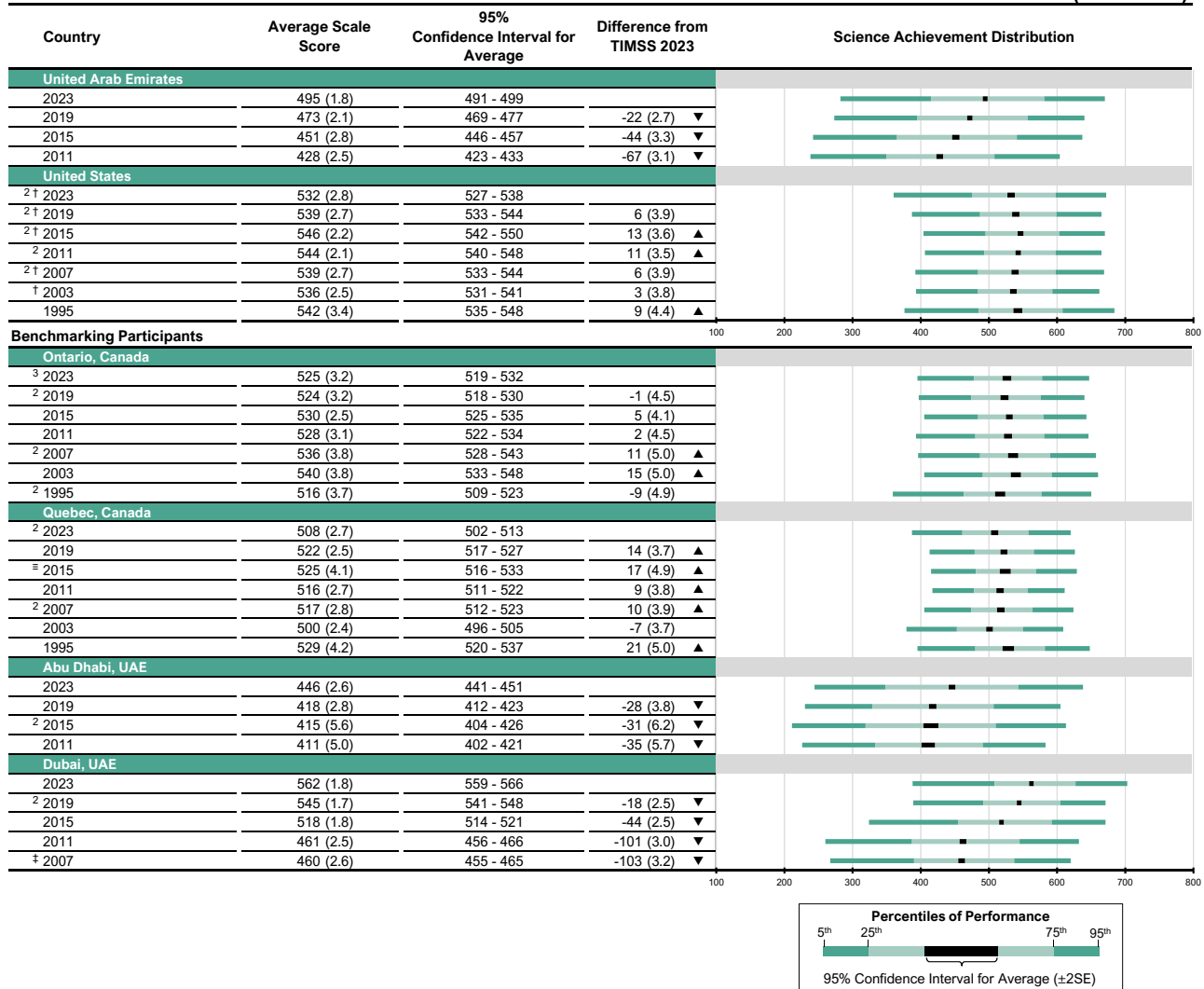


* Average achievement not reliably measured because the percentage of students with achievement too low for estimation exceeds 25%.

SOURCE: IEA's Trends in International Mathematics and Science Study - TIMSS 2023
Downloaded from <https://timss2023.org/results>

Exhibit 2.1.10: Trends in Average Science Achievement and Scale Score Distributions

(Continued)



SOURCE: IEA's Trends in International Mathematics and Science Study - TIMSS 2023
 Downloaded from <https://timss2023.org/results>

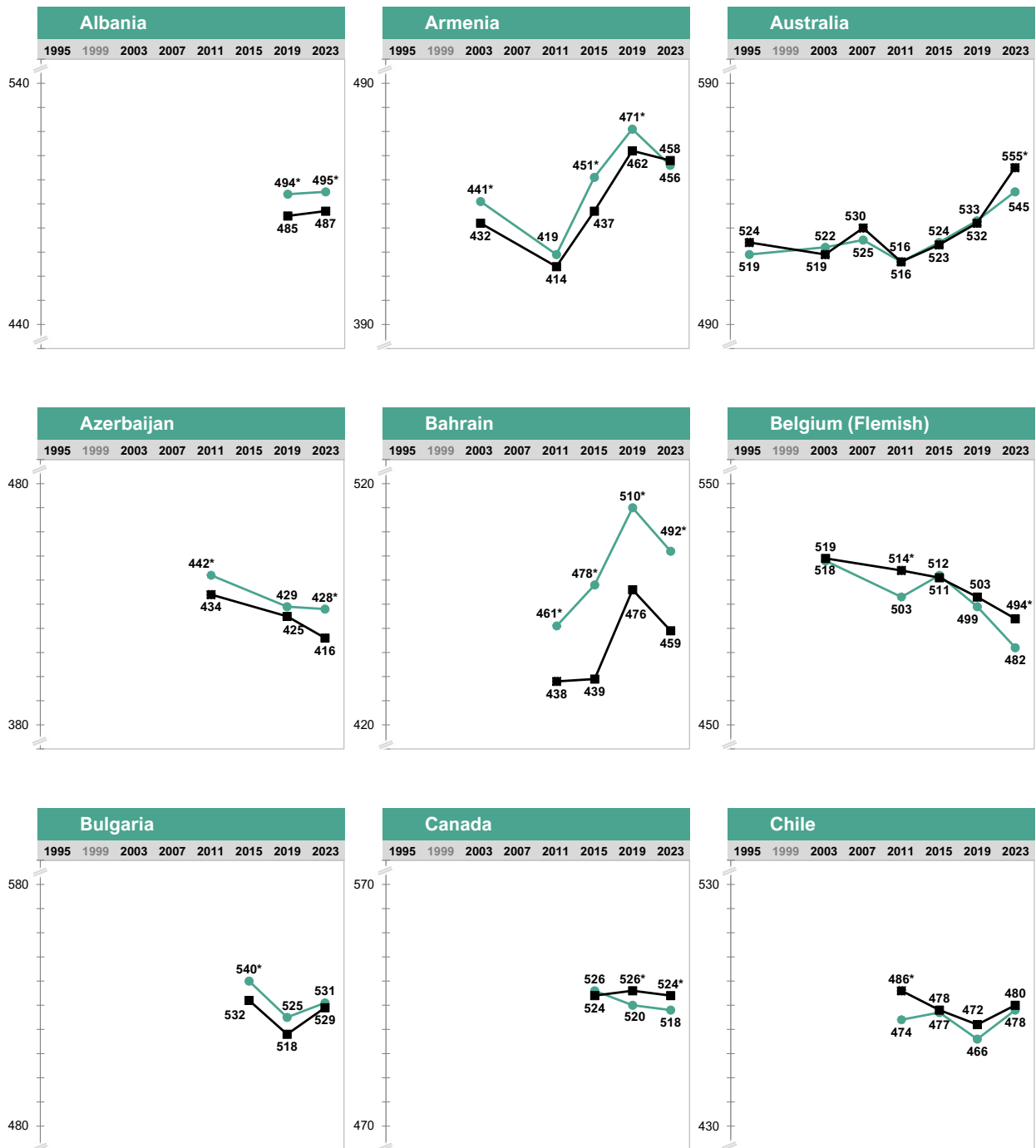
Trend Plots of Average Science Achievement for Girls and Boys (Grade 4)

For the TIMSS 2023 countries with comparable data from previous TIMSS assessments, Exhibit 2.1.11 contains graphs of average science achievement across assessment cycles for girls and boys. In each country graph, the y-axis ranges 120 points with a scale interval of 10 points, but a different part of the scale is shown according to each country's average achievement. Compared to TIMSS 2019, achievement gaps between girls and boys widened in some countries. Among 27 countries with no achievement gap in 2019, three had a gap favoring girls in 2023 and eight had a gap favoring boys. However, in six countries the achievement gap was closed such that the difference between girls and boys was flagged as statistically significant in 2019, but not in 2023.

Exhibit 2.1.11: Trend Plots of Average Science Achievement for Girls and Boys[◇]

This exhibit displays changes in achievement across assessment years for girls and boys for the countries and benchmarking participants that have comparable data from previous TIMSS assessments. The scale interval is 10 points for each country, but a different part of the scale is shown according to each country's average achievement. See Appendix A for country participation in previous assessments.

Girls ● Boys ■ * Average significantly higher than other gender ($p < 0.05$)



[◇] There was no TIMSS fourth grade assessment in 1999. See Appendix A for country participation in previous TIMSS assessments. The scale interval is 10 points for each country, but a different part of the scale is shown according to each country's average achievement. Students' gender information was obtained from school tracking data.

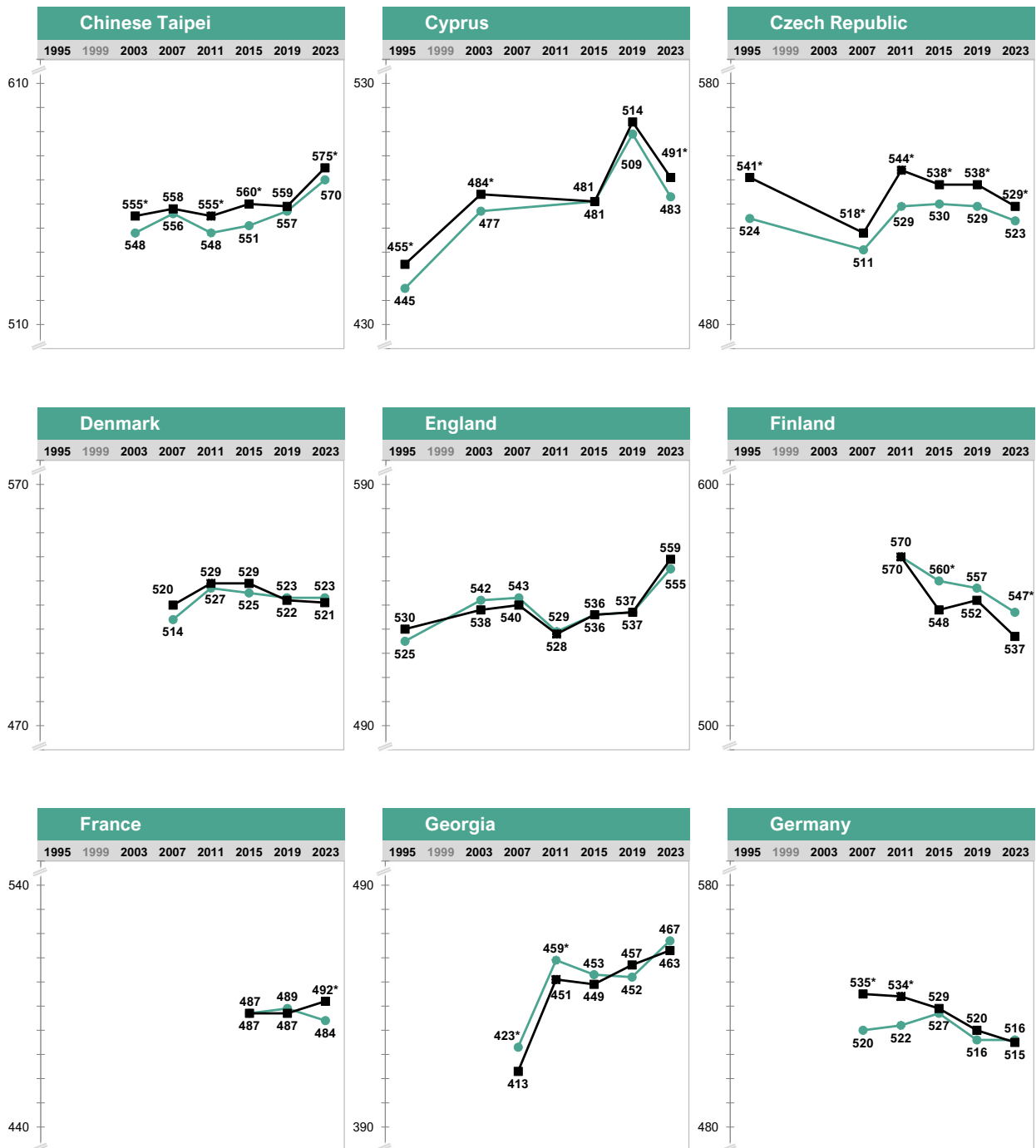
SOURCE: IEA's Trends in International Mathematics and Science Study - TIMSS 2023
Downloaded from <https://timss2023.org/results>

Exhibit 2.1.11: Trend Plots of Average Science Achievement for Girls and Boys[◇]

(Continued)

This exhibit displays changes in achievement across assessment years for girls and boys for the countries and benchmarking participants that have comparable data from previous TIMSS assessments. The scale interval is 10 points for each country, but a different part of the scale is shown according to each country's average achievement. See Appendix A for country participation in previous assessments.

Girls —●— Boys —■— * Average significantly higher than other gender ($p < 0.05$)



[◇] There was no TIMSS fourth grade assessment in 1999. See Appendix A for country participation in previous TIMSS assessments. The scale interval is 10 points for each country, but a different part of the scale is shown according to each country's average achievement. Students' gender information was obtained from school tracking data.

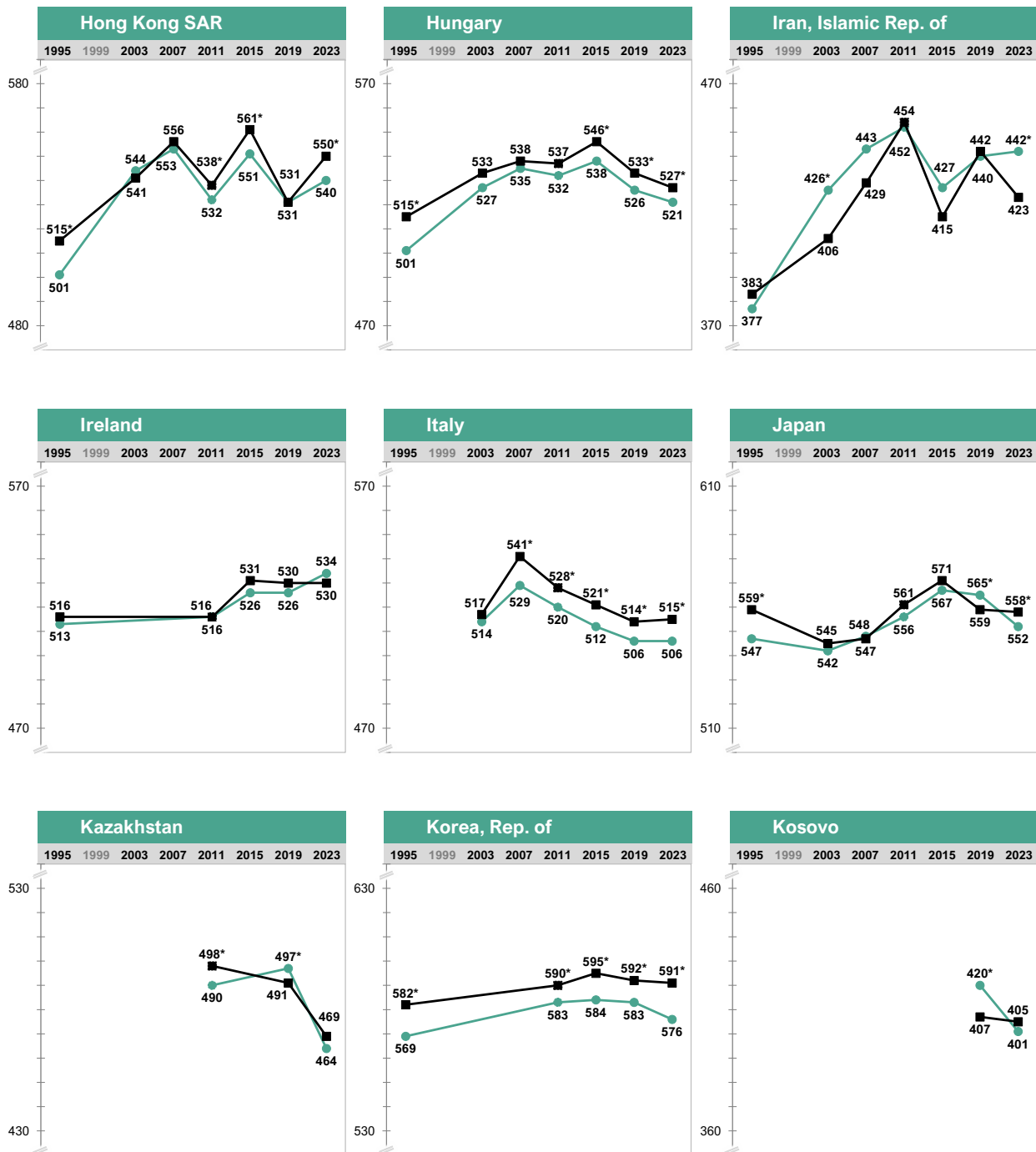
SOURCE: IEA's Trends in International Mathematics and Science Study - TIMSS 2023
Downloaded from <https://timss2023.org/results>

Exhibit 2.1.11: Trend Plots of Average Science Achievement for Girls and Boys[◇]

(Continued)

This exhibit displays changes in achievement across assessment years for girls and boys for the countries and benchmarking participants that have comparable data from previous TIMSS assessments. The scale interval is 10 points for each country, but a different part of the scale is shown according to each country's average achievement. See Appendix A for country participation in previous assessments.

Girls —●— Boys —■— * Average significantly higher than other gender ($p < 0.05$)



[◇] There was no TIMSS fourth grade assessment in 1999. See Appendix A for country participation in previous TIMSS assessments. The scale interval is 10 points for each country, but a different part of the scale is shown according to each country's average achievement. Students' gender information was obtained from school tracking data.

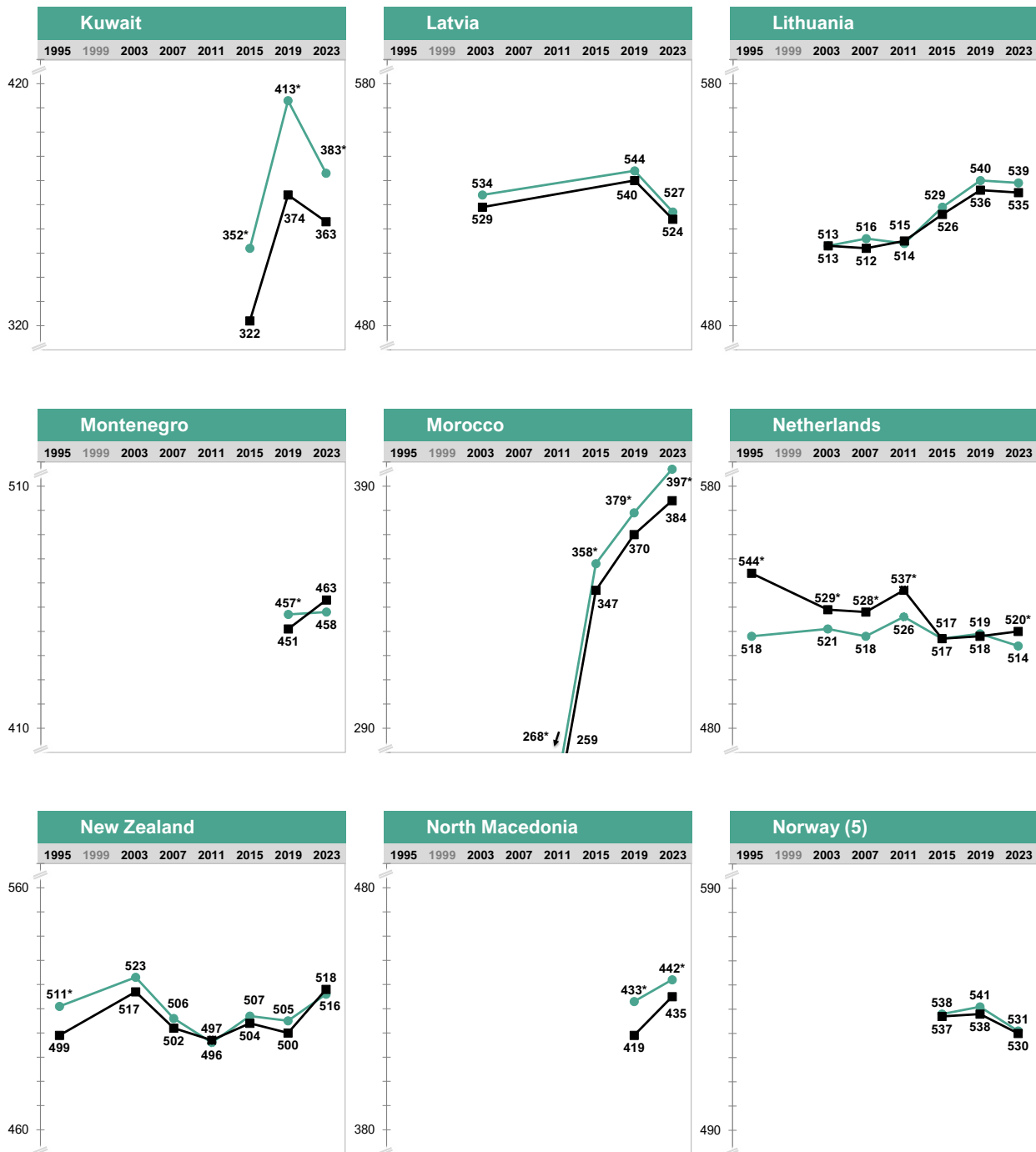
SOURCE: IEA's Trends in International Mathematics and Science Study - TIMSS 2023
Downloaded from <https://timss2023.org/results>

Exhibit 2.1.11: Trend Plots of Average Science Achievement for Girls and Boys[◇]

(Continued)

This exhibit displays changes in achievement across assessment years for girls and boys for the countries and benchmarking participants that have comparable data from previous TIMSS assessments. The scale interval is 10 points for each country, but a different part of the scale is shown according to each country's average achievement. See Appendix A for country participation in previous assessments.

Girls ● Boys ■ * Average significantly higher than other gender ($p < 0.05$)



[◇] There was no TIMSS fourth grade assessment in 1999. See Appendix A for country participation in previous TIMSS assessments. The scale interval is 10 points for each country, but a different part of the scale is shown according to each country's average achievement. Students' gender information was obtained from school tracking data.

SOURCE: IEA's Trends in International Mathematics and Science Study - TIMSS 2023
Downloaded from <https://timss2023.org/results>

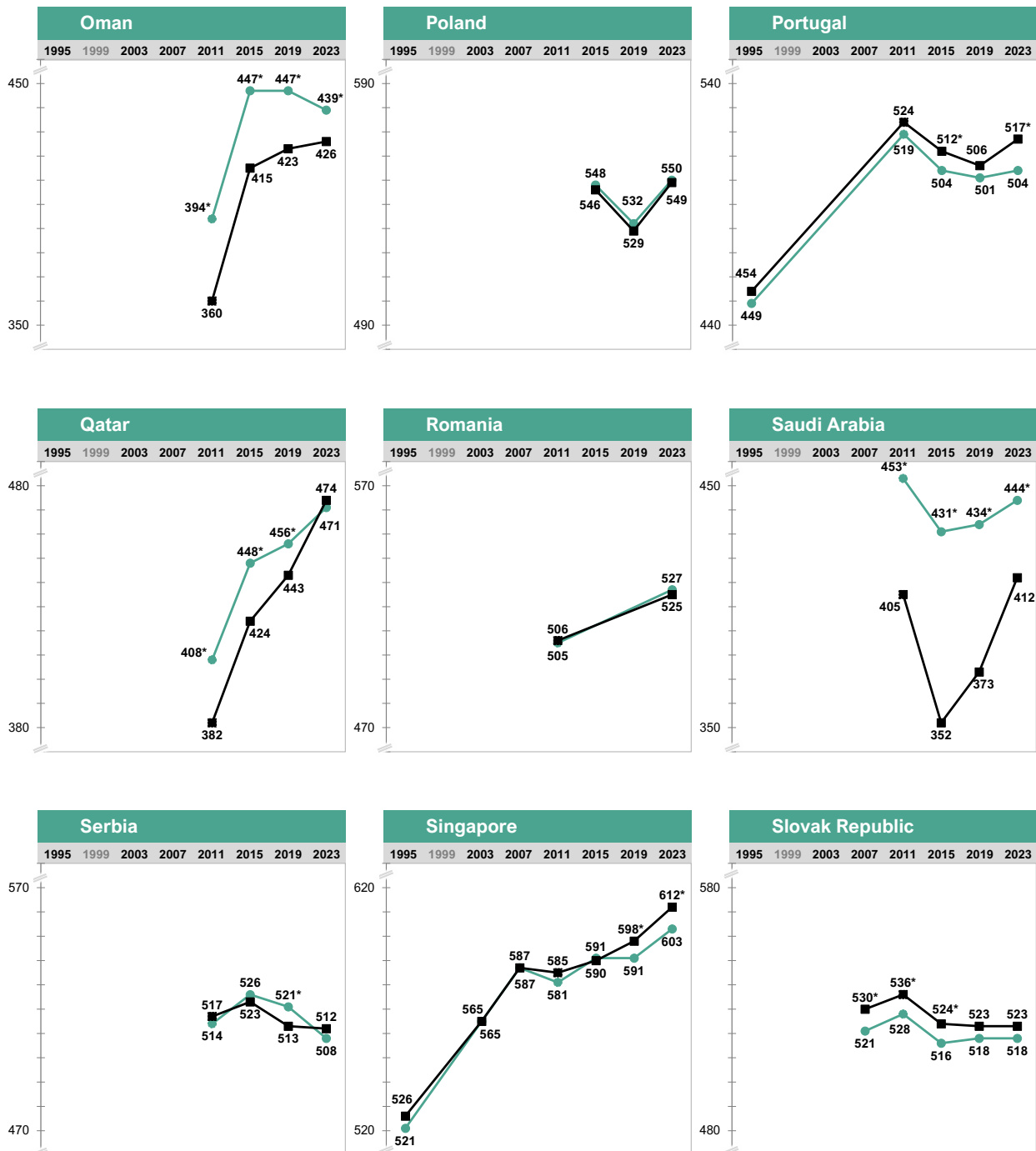
IEA TIMSS & PIRLS
BOSTON COLLEGE

Exhibit 2.1.11: Trend Plots of Average Science Achievement for Girls and Boys[◇]

(Continued)

This exhibit displays changes in achievement across assessment years for girls and boys for the countries and benchmarking participants that have comparable data from previous TIMSS assessments. The scale interval is 10 points for each country, but a different part of the scale is shown according to each country's average achievement. See Appendix A for country participation in previous assessments.

Girls —●— Boys —■— * Average significantly higher than other gender ($p < 0.05$)



[◇] There was no TIMSS fourth grade assessment in 1999. See Appendix A for country participation in previous TIMSS assessments. The scale interval is 10 points for each country, but a different part of the scale is shown according to each country's average achievement. Students' gender information was obtained from school tracking data.

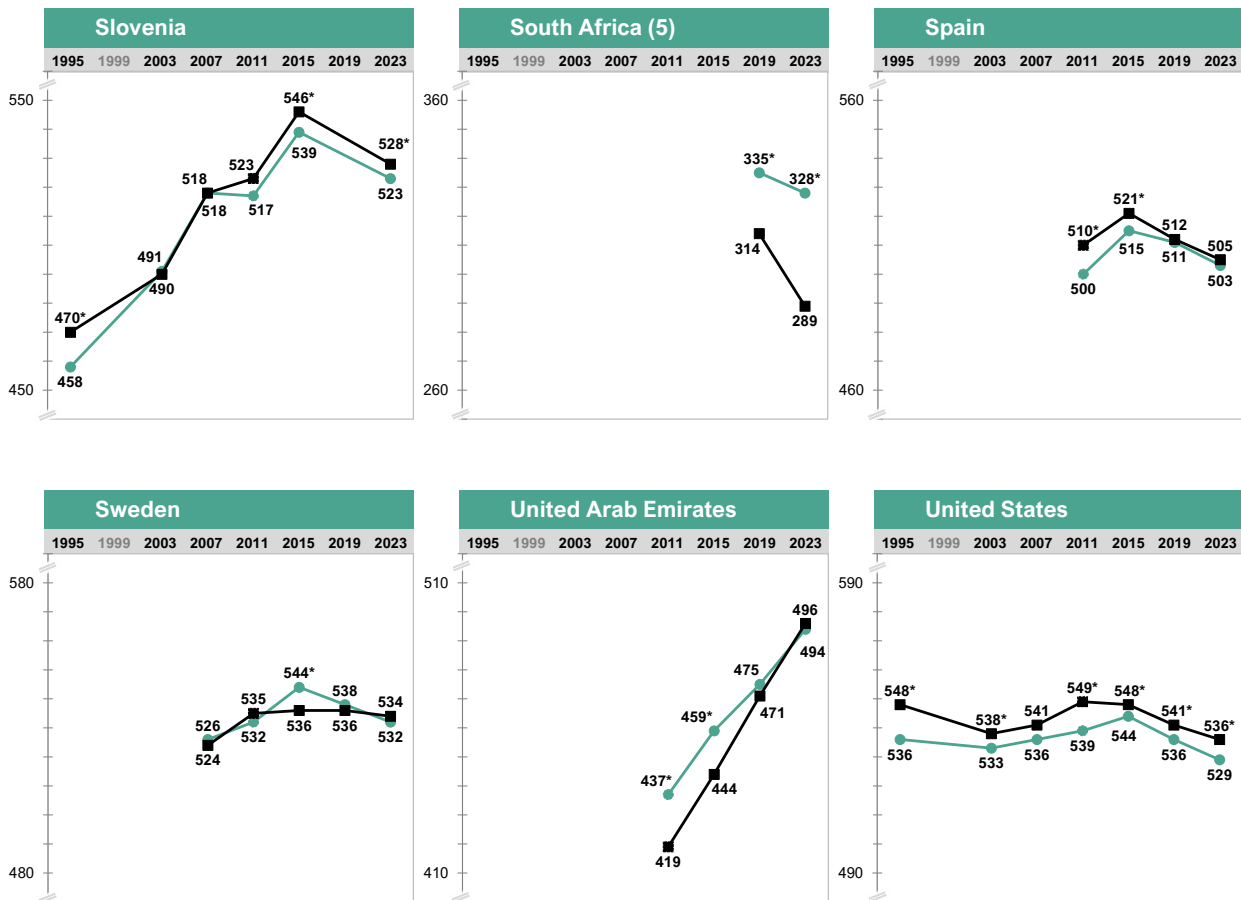
SOURCE: IEA's Trends in International Mathematics and Science Study - TIMSS 2023
Downloaded from <https://timss2023.org/results>

Exhibit 2.1.11: Trend Plots of Average Science Achievement for Girls and Boys[◇]

(Continued)

This exhibit displays changes in achievement across assessment years for girls and boys for the countries and benchmarking participants that have comparable data from previous TIMSS assessments. The scale interval is 10 points for each country, but a different part of the scale is shown according to each country's average achievement. See Appendix A for country participation in previous assessments.

Girls —●— Boys —■— * Average significantly higher than other gender ($p < 0.05$)



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SOURCE: IEA's Trends in International Mathematics and Science Study - TIMSS 2023
Downloaded from <https://timss2023.org/results>

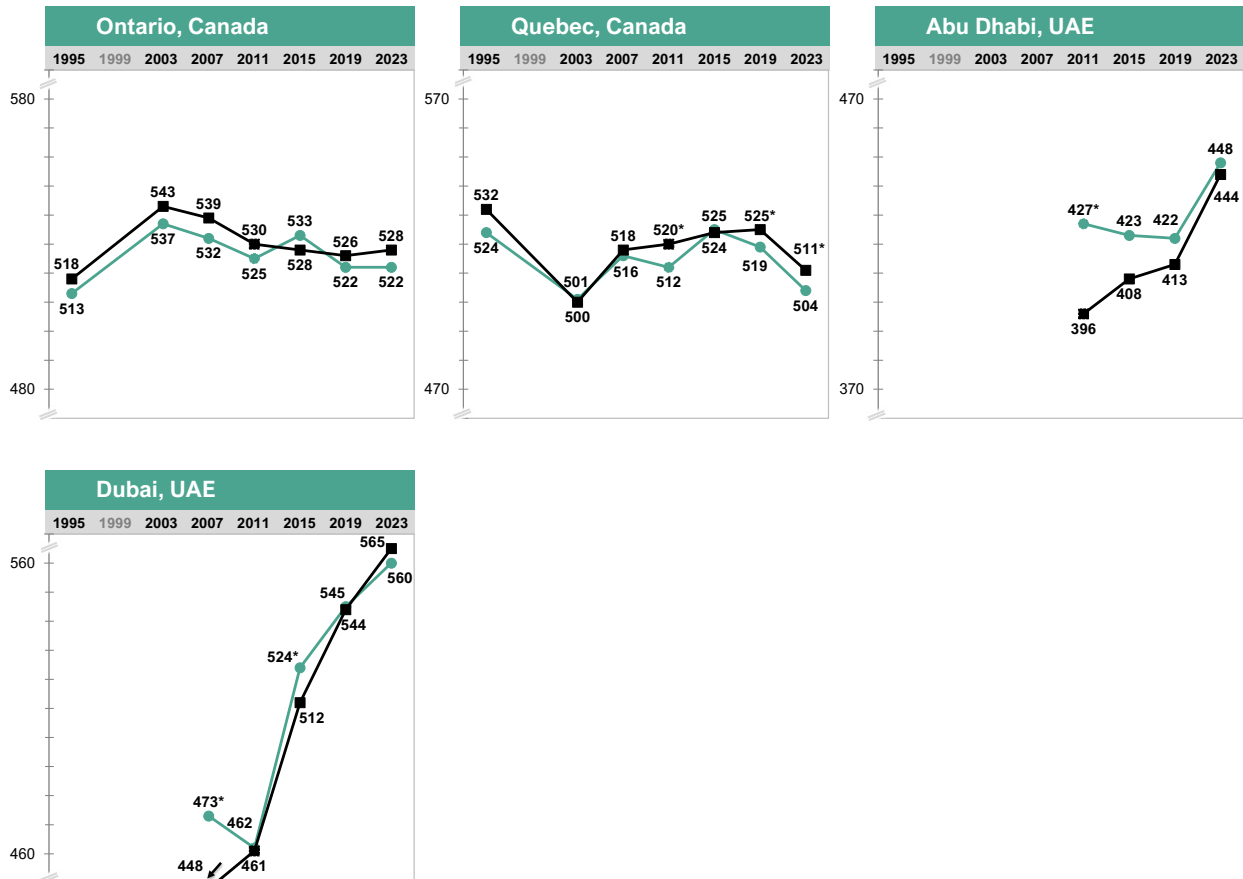
Exhibit 2.1.11: Trend Plots of Average Science Achievement for Girls and Boys[◇]

(Continued)

This exhibit displays changes in achievement across assessment years for girls and boys for the countries and benchmarking participants that have comparable data from previous TIMSS assessments. The scale interval is 10 points for each country, but a different part of the scale is shown according to each country's average achievement. See Appendix A for country participation in previous assessments.

Girls ● Boys ■ * Average significantly higher than other gender ($p < 0.05$)

Benchmarking Participants



[◇] There was no TIMSS fourth grade assessment in 1999. See Appendix A for country participation in previous TIMSS assessments. The scale interval is 10 points for each country, but a different part of the scale is shown according to each country's average achievement. Students' gender information was obtained from school tracking data.

SOURCE: IEA's Trends in International Mathematics and Science Study - TIMSS 2023
Downloaded from <https://timss2023.org/results>

Trends in Distributions of Students Reaching the TIMSS International Benchmarks of Science Achievement (Grade 4)

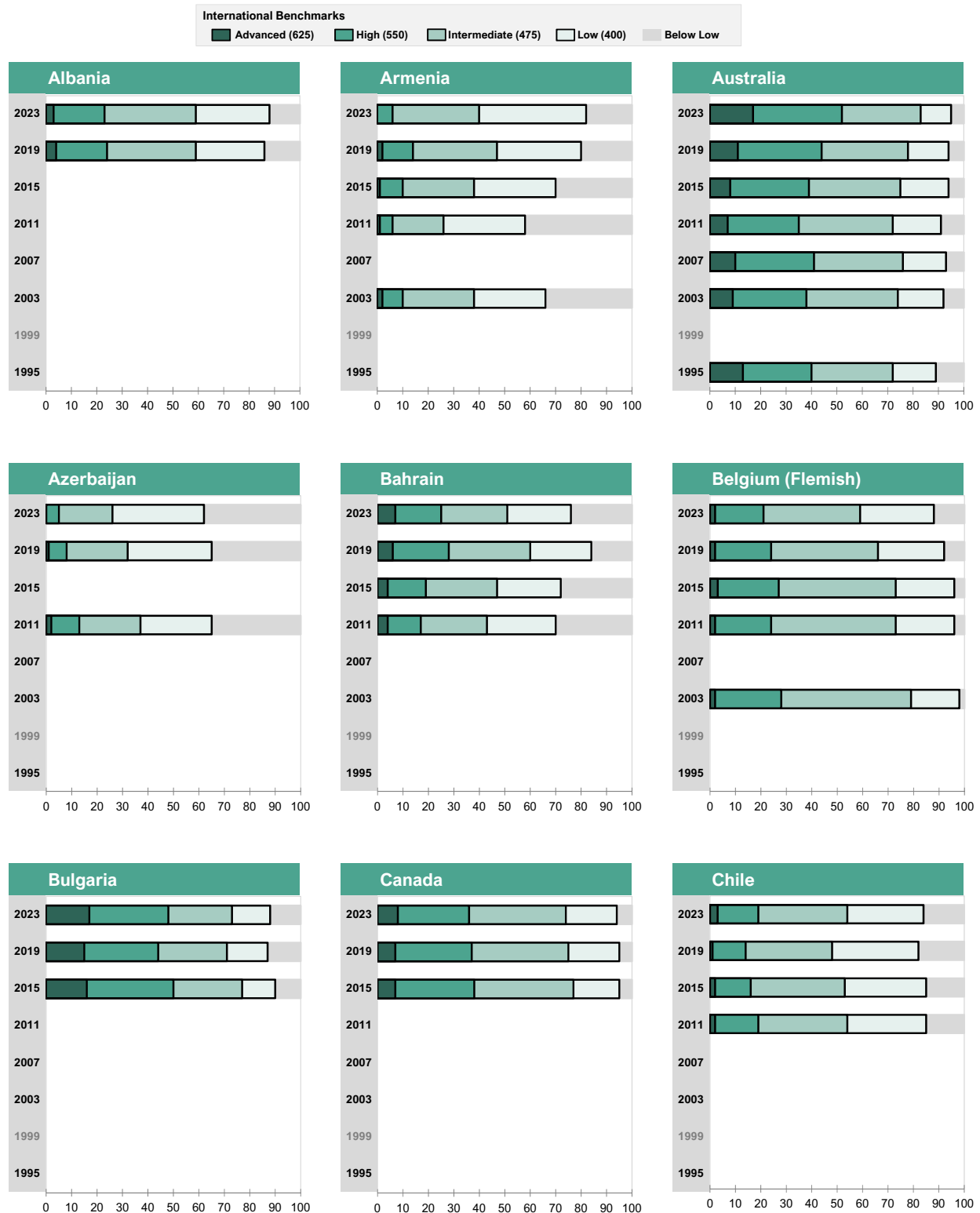
Exhibit 2.1.12 provides bar graphs for each country and benchmarking participant with comparable data from previous TIMSS assessments, presenting the distribution of students at the TIMSS International Benchmarks with a bar for each cycle from 1995 to 2023. Each bar displays the percentage of students reaching each of the International Benchmarks for a given assessment cycle. The shading of the bar segments ranges from dark to light green, and each lighter-colored segment indicates the cumulative percentage of students that reached the less demanding benchmarks. Few students in most countries reach the Advanced Benchmark (darkest green segment); more students reach the High Benchmark (dark green plus medium green segments); even more students reach the Intermediate Benchmark (indicated by three darker segments); finally, in most countries, a large majority of students reach the Low Benchmark (all shades of green combined). The gray area indicates the percentage of students that did not reach the Low International Benchmark (i.e., were “below low”). The achievement of these students cannot be characterized by any of the TIMSS 2023 International Benchmarks.

Students reaching the Intermediate, High, and Advanced International Benchmarks, demonstrated all the science knowledge and skills at their level but also those displayed by the students at the lower levels. Long-term increases in the percentages of students reaching the Low and Intermediate Benchmarks provide an indication that more students over time demonstrate a basic level of science proficiency.

The short-term trends between TIMSS 2019 and TIMSS 2023 show more decreases than increases in percentages of students reaching the High, Intermediate, and Low International Benchmarks. Among the 49 countries that participated in both 2019 and 2023, 11 increased and 12 decreased at the High Benchmark, 8 increased and 14 decreased at the Intermediate Benchmark, and 6 increased and 16 decreased at the Low Benchmark. However, there were 12 countries with increases and 3 with decreases in the percentages of students reaching the Advanced Benchmark.

Exhibit 2.1.12: Trends in Distributions of Students Reaching the TIMSS International Benchmarks of Science Achievement[◇]

This exhibit displays changes in percentages of students reaching the TIMSS International Benchmarks across assessment cycles for the countries and benchmarking participants that have comparable data from previous assessments. See Appendix A for country participation in previous assessments.



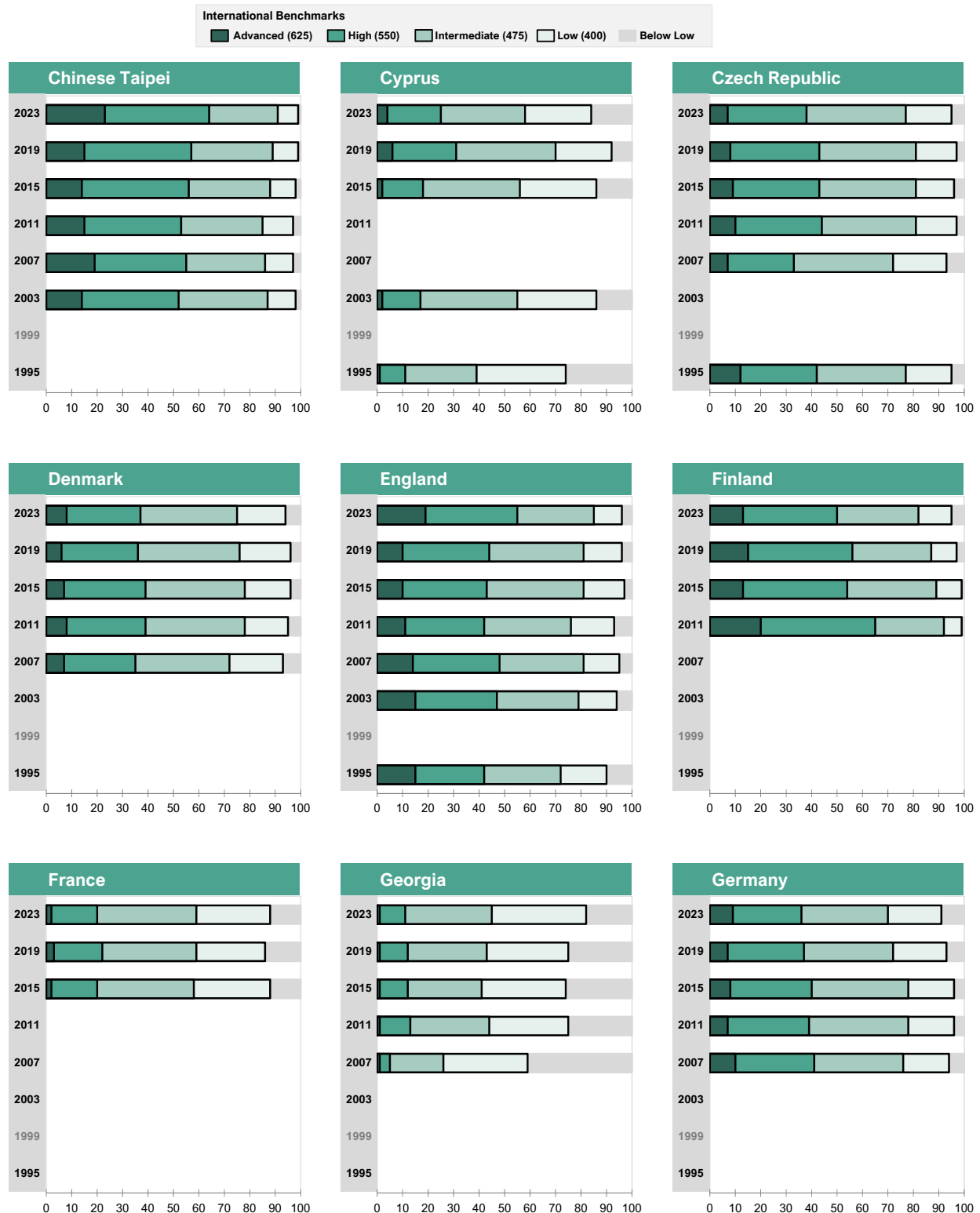
[◇] There was no TIMSS fourth grade assessment in 1999. See Appendix A for country participation in previous TIMSS assessments.

SOURCE: IEA's Trends in International Mathematics and Science Study - TIMSS 2023
Downloaded from <https://timss2023.org/results>

Exhibit 2.1.12: Trends in Distributions of Students Reaching the TIMSS International Benchmarks of Science Achievement[◇]

(Continued)

This exhibit displays changes in percentages of students reaching the TIMSS International Benchmarks across assessment cycles for the countries and benchmarking participants that have comparable data from previous assessments. See Appendix A for country participation in previous assessments.



[◇] There was no TIMSS fourth grade assessment in 1999. See Appendix A for country participation in previous TIMSS assessments.

SOURCE: IEA's Trends in International Mathematics and Science Study - TIMSS 2023
Downloaded from <https://timss2023.org/results>

Exhibit 2.1.12: Trends in Distributions of Students Reaching the TIMSS International Benchmarks of Science Achievement[◇]

(Continued)

This exhibit displays changes in percentages of students reaching the TIMSS International Benchmarks across assessment cycles for the countries and benchmarking participants that have comparable data from previous assessments. See Appendix A for country participation in previous assessments.



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SOURCE: IEA's Trends in International Mathematics and Science Study - TIMSS 2023
Downloaded from <https://timss2023.org/results>

Exhibit 2.1.12: Trends in Distributions of Students Reaching the TIMSS International Benchmarks of Science Achievement[◇]

(Continued)

This exhibit displays changes in percentages of students reaching the TIMSS International Benchmarks across assessment cycles for the countries and benchmarking participants that have comparable data from previous assessments. See Appendix A for country participation in previous assessments.



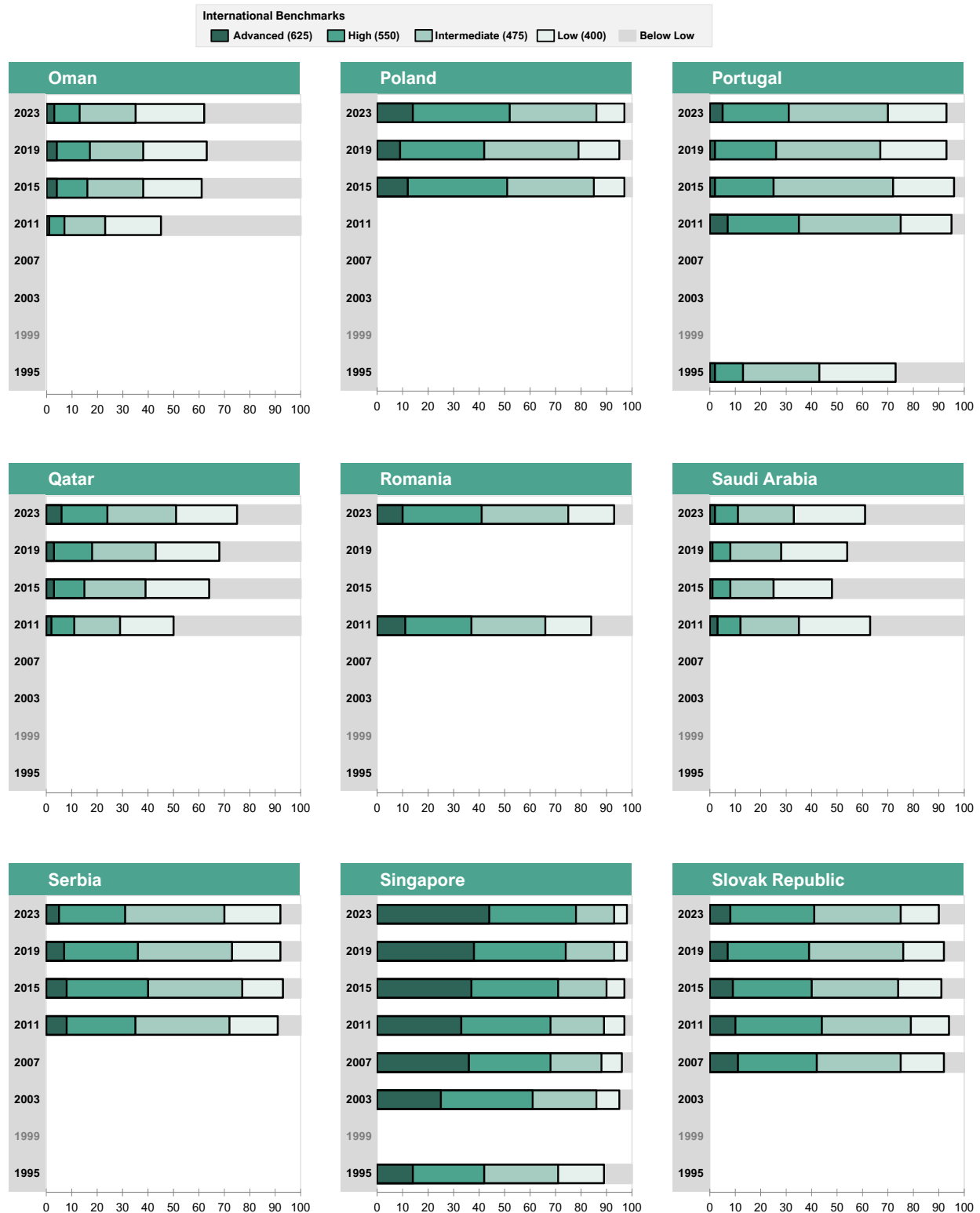
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Exhibit 2.1.12: Trends in Distributions of Students Reaching the TIMSS International Benchmarks of Science Achievement[◇]

(Continued)

This exhibit displays changes in percentages of students reaching the TIMSS International Benchmarks across assessment cycles for the countries and benchmarking participants that have comparable data from previous assessments. See Appendix A for country participation in previous assessments.



[◇] There was no TIMSS fourth grade assessment in 1999. See Appendix A for country participation in previous TIMSS assessments.

SOURCE: IEA's Trends in International Mathematics and Science Study - TIMSS 2023
Downloaded from <https://timss2023.org/results>

Exhibit 2.1.12: Trends in Distributions of Students Reaching the TIMSS International Benchmarks of Science Achievement[◇]

(Continued)

This exhibit displays changes in percentages of students reaching the TIMSS International Benchmarks across assessment cycles for the countries and benchmarking participants that have comparable data from previous assessments. See Appendix A for country participation in previous assessments.



[◇] There was no TIMSS fourth grade assessment in 1999. See Appendix A for country participation in previous TIMSS assessments.

SOURCE: IEA's Trends in International Mathematics and Science Study - TIMSS 2023
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Exhibit 2.1.12: Trends in Distributions of Students Reaching the TIMSS International Benchmarks of Science Achievement[◇]

(Continued)

This exhibit displays changes in percentages of students reaching the TIMSS International Benchmarks across assessment cycles for the countries and benchmarking participants that have comparable data from previous assessments. See Appendix A for country participation in previous assessments.



[◇] There was no TIMSS fourth grade assessment in 1999. See Appendix A for country participation in previous TIMSS assessments.

SOURCE: IEA's Trends in International Mathematics and Science Study - TIMSS 2023
Downloaded from <https://timss2023.org/results>

Grade 4 Relative Achievement in Science Content and Cognitive Domains

Introduction to Science Content and Cognitive Domains (Grade 4)

The [TIMSS 2023 Science Framework](#) specified three content domains in fourth-grade science: life science, physical science, and earth science. The proportion of items in the assessment belonging to these three domains is determined by the number of topics within each domain. These framework specifications informed assessment composition and item development.

Life Science Content Domain

Forty-five percent of the fourth-grade science assessment was devoted to life science topics, including characteristics and life processes of organisms; life cycles, reproduction, and heredity; organisms, environment, and their interactions; ecosystems; and human health. Students at the fourth grade were expected to have some knowledge about general characteristics of organisms, how they function, and how they interact with other organisms and with their environment, as well as to be familiar with fundamental science concepts related to life cycles, heredity, and human health.

Physical Science Content Domain

The topic areas for the physical science content domain made up 35 percent of the assessment, including classification and properties of matter and changes in matter; forms of energy and energy transfer; and forces and motion. Students were asked about physical states of matter (solid, liquid, and gas); common changes in the state and form of matter; common forms and sources of energy and their practical uses; and basic concepts about light, sound, electricity, and magnetism, as well as forces and motion.

Earth Science Content Domain

The earth science domain (20% of the assessment) included three topic areas: Earth's physical characteristics, resources, and history; Earth's weather and climates; and Earth in the Solar System. Students were asked about the structure and physical characteristics of Earth's surface and about the use of Earth's most important resources, and were asked to describe some of Earth's processes in terms of observable changes and recognize the time frame over which such changes have occurred. They also were asked about Earth's place in the Solar System based on observations of patterns of change on Earth and in the sky.

Knowing, Applying, and Reasoning Cognitive Domains

Fourth-grade students also needed to draw on a range of cognitive skills across the content domains described above. The cognitive skills were categorized into three broad domains—knowing, applying, and reasoning. Forty percent of the fourth-grade assessment was devoted to the knowing domain, 40 percent to applying, and 20 percent to reasoning. The knowing domain covers recognizing, describing, and providing examples of facts, concepts, and procedures students were expected to know at fourth grade. The applying domain focuses on students’ ability to apply knowledge and conceptual understanding through comparing, explaining, relating, and interpreting models and information to solve practical problems or answer questions. The reasoning domain goes beyond the solution of familiar problems to encompass unfamiliar situations, complex contexts, and multistep problems. Additionally, five science practices fundamental to scientific inquiry were assessed within the content areas and cognitive domains.

The results in the content and cognitive subscales are presented to provide a more nuanced view of overall science achievement. The comparison between overall science achievement and particular subscales may indicate countries’ relative strengths and weaknesses within overall science. However, the subscales are based on only a subset of the assessment items, making them somewhat less robust than the overall science achievement results based on the entire set of items.

For information about how the subscales for the content and cognitive domains were created, see Chapter 12 in the [TIMSS 2023 Technical Report](#).

Relative Achievement in Science Content Domains (Grade 4)

Exhibit 2.1.13 shows countries’ average achievement in each of the three science content domains relative to their overall average achievement (presented from highest to lowest overall average achievement as the default sort). The exhibit also highlights differences based on a test of statistical significance between the average domain score and the overall science score using an alpha level of 0.01. A smaller alpha level was used to flag statistical significance of subdomain differences to reduce the number of false positives that can be expected due to multiple comparisons across multiple countries and dependent sub-scores. Differences are computed for each student and averaged across the country, rather than comparing different groups of students as in previous exhibits in this section. This within-student dependency leads to considerably smaller standard errors (given in parentheses and reported together with the estimates in the exhibit).

Of the 57 participating countries for which science content domain scores were estimated, nine had a relative strength in life science and 18 had a relative weakness; 21 had a relative strength in physical science and 13 had a relative weakness, and nine had a relative strength in earth science and 17 had a relative weakness.

Exhibit 2.1.13: Relative Achievement in Science Content Domains

Country	Overall Science Average Scale Score	Life Science (79 Items)		Physical Science (61 Items)		Earth Science (33 Items)	
		Average Scale Score	Difference from Overall Score	Average Scale Score	Difference from Overall Score	Average Scale Score	Difference from Overall Score
³ Singapore	607 (2.8)	614 (3.0)	6 (0.7) ▲	622 (2.9)	14 (1.2) ▲	578 (2.8)	-30 (1.4) ▼
Korea, Rep. of	583 (2.5)	579 (2.8)	-4 (1.5) ▼	595 (2.6)	11 (1.4) ▲	573 (3.5)	-10 (2.2) ▼
Chinese Taipei	573 (1.7)	562 (2.3)	-10 (1.2) ▼	582 (1.7)	9 (0.9) ▲	574 (2.5)	1 (1.6)
³ Türkiye (5)	570 (3.4)	554 (3.6)	-16 (1.0) ▼	589 (3.9)	19 (1.9) ▲	576 (4.5)	6 (2.8)
² England	556 (2.6)	555 (3.0)	-1 (1.7)	558 (3.1)	1 (1.5)	554 (3.5)	-2 (1.8)
Japan	555 (2.4)	544 (3.1)	-11 (2.5) ▼	573 (2.9)	18 (1.7) ▲	542 (2.4)	-13 (1.5) ▼
² Poland	550 (2.2)	550 (2.7)	0 (1.6)	549 (2.4)	-1 (1.0)	552 (2.8)	2 (2.8)
Australia	550 (2.3)	554 (2.6)	5 (2.1)	545 (2.4)	-5 (1.6) ▼	549 (2.7)	-1 (2.7)
¹ Hong Kong SAR	545 (3.8)	541 (4.0)	-4 (1.9)	553 (3.9)	8 (1.7) ▲	539 (4.9)	-6 (3.5)
Finland	542 (2.9)	543 (3.0)	1 (1.5)	537 (2.8)	-5 (0.7) ▼	551 (3.0)	9 (1.8) ▲
² Lithuania	537 (2.9)	531 (2.6)	-6 (1.7) ▼	544 (2.9)	7 (1.7) ▲	535 (3.4)	-2 (1.3)
Macao SAR	536 (1.4)	529 (1.4)	-7 (1.1) ▼	545 (1.3)	10 (1.5) ▲	534 (2.3)	-1 (2.0)
² Sweden	533 (3.2)	532 (3.5)	-1 (1.2)	532 (3.4)	-1 (1.6)	537 (4.2)	5 (1.9)
² United States	532 (2.8)	541 (2.9)	8 (1.1) ▲	525 (3.2)	-8 (1.4) ▼	528 (3.5)	-5 (1.8) ▼
Ireland	532 (3.2)	535 (3.6)	3 (1.7)	528 (3.4)	-4 (1.5) ▼	534 (4.1)	2 (2.7)
² Norway (5)	530 (2.6)	534 (3.0)	3 (1.5)	520 (2.8)	-10 (1.1) ▼	543 (3.0)	13 (1.5) ▲
Bulgaria	530 (4.8)	530 (5.1)	0 (1.5)	527 (5.0)	-3 (1.3)	535 (6.0)	6 (3.6)
² Romania	526 (4.8)	524 (5.1)	-3 (1.6)	530 (5.0)	4 (1.9)	526 (5.2)	0 (2.6)
² Czech Republic	526 (2.3)	529 (2.0)	3 (0.9) ▲	525 (2.4)	-1 (1.1)	520 (3.0)	-6 (2.1) ▼
Slovenia	526 (2.3)	520 (2.3)	-6 (0.9) ▼	533 (2.3)	7 (1.7) ▲	523 (2.8)	-2 (1.6)
Latvia	526 (3.0)	518 (3.5)	-7 (1.4) ▼	533 (3.7)	8 (2.0) ▲	522 (3.9)	-4 (1.7)
Hungary	524 (3.2)	527 (3.3)	3 (1.7)	514 (3.1)	-10 (1.1) ▼	534 (3.9)	10 (2.3) ▲
¹ Denmark	522 (2.6)	531 (2.7)	9 (1.5) ▲	510 (2.9)	-12 (1.2) ▼	525 (2.9)	3 (1.4)
¹ Canada	521 (2.0)	526 (2.3)	5 (1.3) ▲	516 (1.8)	-5 (1.2) ▼	520 (2.6)	-1 (1.5)
Slovak Republic	521 (3.3)	519 (3.7)	-2 (1.4)	523 (3.7)	2 (1.1)	519 (3.8)	-2 (2.1)
² New Zealand	517 (2.8)	520 (3.0)	3 (1.9)	512 (3.0)	-5 (1.5) ▼	520 (2.4)	3 (2.0)
¹ Netherlands	517 (2.9)	518 (3.2)	1 (1.2)	509 (2.5)	-8 (2.4) ▼	527 (2.9)	10 (3.3) ▲
Germany	515 (2.8)	515 (2.8)	0 (1.0)	515 (2.8)	0 (1.5)	512 (3.4)	-4 (2.9)
Portugal	511 (2.3)	511 (2.9)	0 (1.5)	507 (2.7)	-4 (1.6)	516 (2.9)	5 (1.5) ▲
² Italy	511 (2.5)	510 (2.9)	0 (1.2)	510 (2.6)	-1 (1.1)	508 (3.1)	-3 (2.0)
² Serbia	510 (3.2)	505 (4.0)	-5 (2.2)	520 (3.4)	10 (2.5) ▲	498 (3.1)	-12 (2.3) ▼
² Spain	504 (2.1)	502 (2.4)	-2 (1.0)	505 (2.4)	1 (1.4)	505 (2.6)	1 (2.0)
United Arab Emirates	495 (1.8)	486 (1.7)	-9 (0.6) ▼	501 (1.6)	7 (0.7) ▲	503 (1.8)	8 (0.8) ▲
² Albania	491 (4.5)	488 (5.1)	-3 (2.1)	495 (5.4)	5 (3.1)	490 (5.5)	-1 (2.8)
² Belgium (Flemish)	488 (2.6)	491 (2.6)	3 (1.0) ▲	483 (2.8)	-6 (1.3) ▼	490 (3.4)	2 (2.8)
² France	488 (3.0)	487 (3.5)	-1 (1.4)	485 (3.0)	-3 (2.0)	489 (4.2)	1 (2.2)
² Cyprus	487 (3.1)	492 (3.2)	5 (1.2) ▲	485 (3.5)	-2 (1.5)	470 (3.8)	-17 (2.0) ▼
² Belgium (French)	481 (2.8)	478 (2.9)	-3 (1.5)	484 (2.3)	4 (2.1)	474 (3.4)	-6 (2.2) ▼
² Chile	479 (2.7)	487 (2.4)	7 (1.0) ▲	472 (2.7)	-8 (2.1) ▼	472 (3.2)	-7 (1.4) ▼
Bahrain	475 (3.9)	468 (4.2)	-7 (1.0) ▼	483 (4.0)	8 (1.7) ▲	470 (4.0)	-5 (2.1)
Qatar	472 (3.6)	463 (3.7)	-9 (1.7) ▼	480 (4.1)	8 (1.8) ▲	474 (3.9)	2 (2.8)
² Kazakhstan	467 (3.5)	454 (3.5)	-12 (1.8) ▼	477 (3.6)	10 (1.2) ▲	464 (3.8)	-3 (1.4)
¹ Georgia	465 (3.4)	464 (3.5)	-1 (1.7)	464 (3.4)	-1 (1.4)	460 (4.5)	-5 (2.5)
² Montenegro	461 (2.0)	461 (2.0)	1 (0.7)	462 (2.8)	1 (2.0)	451 (2.4)	-10 (1.6) ▼
² Armenia	457 (2.7)	460 (2.6)	2 (1.4)	461 (2.7)	4 (1.0) ▲	437 (3.0)	-21 (1.6) ▼
¹ Bosnia & Herzegovina	448 (3.7)	442 (3.5)	-6 (1.5) ▼	452 (4.2)	3 (3.5)	447 (5.7)	-1 (5.1)
North Macedonia	439 (3.9)	436 (3.4)	-3 (2.2)	442 (3.8)	3 (1.5)	434 (3.5)	-5 (1.8) ▼
Oman	433 (4.2)	426 (4.5)	-7 (1.1) ▼	442 (4.2)	9 (1.9) ▲	428 (4.4)	-5 (1.1) ▼
Iran, Islamic Rep. of	432 (4.5)	425 (4.3)	-7 (1.6) ▼	438 (5.4)	6 (2.1) ▲	426 (4.3)	-6 (1.4) ▼
³ Saudi Arabia	428 (4.0)	414 (4.2)	-14 (2.1) ▼	437 (4.5)	9 (2.4) ▲	442 (4.3)	15 (1.6) ▲
² Brazil	425 (3.5)	429 (3.9)	4 (0.9) ▲	425 (3.2)	0 (1.2)	407 (3.8)	-18 (1.1) ▼
Azerbaijan	422 (3.3)	421 (2.7)	0 (2.4)	419 (3.1)	-3 (2.8)	413 (4.6)	-8 (2.8) ▼
Jordan	418 (4.9)	404 (5.2)	-14 (1.6) ▼	433 (5.8)	16 (2.8) ▲	413 (6.0)	-5 (2.1)
Uzbekistan	412 (3.5)	410 (3.7)	-2 (1.7)	406 (3.9)	-6 (2.7)	422 (4.3)	10 (2.0) ▲
² Kosovo	403 (3.6)	387 (3.4)	-16 (1.3) ▼	416 (4.2)	13 (1.8) ▲	420 (3.8)	17 (1.6) ▲
Morocco	390 (5.3)	386 (5.1)	-4 (1.7)	389 (5.9)	-1 (1.9)	380 (5.7)	-11 (3.4) ▼
⁴ Kuwait	373 (5.5)	372 (5.9)	-2 (2.6)	359 (6.3)	-14 (2.5) ▼	376 (5.8)	3 (2.5)
³ South Africa (5)	308 (4.7)	-	-	-	-	-	-
Benchmarking Participants							
Dubai, UAE	562 (1.8)	555 (1.5)	-8 (1.4) ▼	570 (2.1)	8 (1.3) ▲	569 (2.5)	7 (1.6) ▲
³ Ontario, Canada	525 (3.2)	533 (3.4)	8 (1.5) ▲	520 (3.0)	-6 (1.1) ▼	522 (3.9)	-3 (1.7)
² Quebec, Canada	508 (2.7)	508 (3.1)	1 (1.5)	502 (2.5)	-5 (1.3) ▼	511 (3.2)	4 (2.1)
Sharjah, UAE	503 (3.9)	493 (3.9)	-9 (0.9) ▼	512 (4.3)	10 (1.2) ▲	507 (4.2)	4 (1.4) ▲
Abu Dhabi, UAE	446 (2.6)	439 (2.6)	-7 (1.1) ▼	449 (2.2)	3 (1.5)	457 (2.2)	11 (1.5) ▲

▲ ▼ Subscale score significantly different from overall score ($p < 0.01$)

Numbers of items are based on the TIMSS 2023 fourth-grade science items included in scaling.

() Standard errors appear in parentheses. Because of rounding some results may appear inconsistent.

See Appendix B.2 for population coverage notes 1, 2, and 3. See Appendix B.5 for sampling guidelines and sampling participation notes †, ‡, and =.

Ψ Reservations about reliability because the percentage of students with achievement too low for estimation exceeds 15% but does not exceed 25%.

✱ Average achievement not reliably measured because the percentage of students with achievement too low for estimation exceeds 25%.

A dash (-) indicates comparable data not available because average achievement could not be accurately estimated.

SOURCE: IEA's Trends in International Mathematics and Science Study - TIMSS 2023
Downloaded from <https://timss2023.org/results>

Relative Achievement in Science Cognitive Domains (Grade 4)

Exhibit 2.1.14 shows countries' average achievement estimates in the knowing, applying, and reasoning cognitive domains relative to their overall average achievement estimates (sorted from highest to lowest overall average achievement as the default sort). The exhibit also highlights differences based on a test of statistical significance between the average domain score and the overall science score using an alpha level of 0.01. A smaller alpha level was used to flag statistical significance of subdomain differences to reduce the number of false positives that can be expected due to multiple comparisons across multiple countries and dependent sub-scores.

Differences are computed for each student and averaged across the country, rather than comparing different groups of students as in previous exhibits in this section. This within student dependency leads to considerably smaller standard errors (given in parentheses and reported together with the estimates in the exhibit).

In the knowing domain, eight countries had a relative strength and 10 had a relative weakness. In the applying domain, five countries had a relative strength and 13 had a relative weakness. In reasoning, 10 countries had a relative strength and 15 had a relative weakness.

Exhibit 2.1.14: Relative Achievement in Science Cognitive Domains

Country	Overall Science Average Scale Score	Knowing (69 Items)		Applying (72 Items)		Reasoning (32 Items)	
		Average Scale Score	Difference from Overall Score	Average Scale Score	Difference from Overall Score	Average Scale Score	Difference from Overall Score
³ Singapore	607 (2.8)	610 (2.9)	3 (1.4)	595 (2.7)	-13 (1.4) ▼	621 (2.8)	14 (1.5) ▲
Korea, Rep. of	583 (2.5)	584 (2.9)	1 (1.6)	584 (2.5)	0 (1.2)	583 (2.4)	0 (1.2)
Chinese Taipei	573 (1.7)	580 (2.0)	7 (1.1) ▲	569 (2.5)	-4 (1.5)	567 (2.0)	-6 (1.2) ▼
³ Türkiye (5)	570 (3.4)	572 (4.1)	2 (2.5)	567 (4.0)	-3 (2.5)	574 (3.9)	4 (2.4)
² England	556 (2.6)	555 (3.1)	-1 (2.1)	558 (3.0)	1 (1.9)	556 (2.8)	-1 (2.0)
Japan	555 (2.4)	538 (3.3)	-17 (2.2) ▼	560 (2.9)	5 (1.2) ▲	568 (2.5)	13 (1.2) ▲
² Poland	550 (2.2)	548 (2.0)	-2 (1.2)	553 (2.3)	3 (1.2)	546 (2.5)	-4 (2.1)
Australia	550 (2.3)	552 (2.8)	3 (2.5)	548 (2.4)	-1 (1.5)	548 (3.6)	-2 (2.3)
¹ Hong Kong SAR	545 (3.8)	548 (4.9)	2 (2.5)	543 (3.8)	-3 (1.6)	542 (4.6)	-3 (2.4)
Finland	542 (2.9)	541 (2.9)	-1 (1.2)	545 (2.9)	3 (0.7) ▲	540 (3.0)	-2 (1.5)
² Lithuania	537 (2.9)	537 (2.7)	0 (1.3)	533 (2.7)	-4 (1.4) ▼	543 (2.5)	6 (2.0) ▲
Macao SAR	536 (1.4)	538 (1.8)	2 (1.4)	534 (1.6)	-2 (0.7) ▼	534 (1.5)	-2 (1.3)
² Sweden	533 (3.2)	523 (3.8)	-10 (1.6) ▼	532 (3.3)	0 (1.3)	546 (3.5)	14 (1.3) ▲
²¹ United States	532 (2.8)	535 (3.3)	2 (1.3)	530 (3.0)	-2 (0.9)	530 (3.0)	-3 (0.7) ▼
Ireland	532 (3.2)	534 (3.1)	2 (1.6)	530 (3.7)	-2 (2.1)	531 (3.3)	-1 (1.1)
² Norway (5)	530 (2.6)	529 (2.5)	-2 (1.0)	530 (2.4)	0 (1.2)	534 (3.1)	3 (2.2)
Bulgaria	530 (4.8)	535 (5.0)	5 (1.9) ▲	528 (5.0)	-2 (1.6)	523 (5.3)	-6 (2.1) ▼
²⁵ Romania	526 (4.8)	523 (4.7)	-3 (1.9)	521 (4.9)	-5 (1.7) ▼	540 (4.9)	14 (1.3) ▲
² Czech Republic	526 (2.3)	524 (2.6)	-2 (1.2)	523 (2.3)	-3 (1.3)	529 (2.9)	3 (1.6)
Slovenia	526 (2.3)	524 (2.2)	-2 (2.0)	534 (2.6)	8 (1.6) ▲	512 (2.6)	-13 (2.2) ▼
Latvia	526 (3.0)	522 (3.0)	-4 (1.9)	525 (3.4)	0 (1.3)	529 (3.7)	4 (1.8)
Hungary	524 (3.2)	522 (3.7)	-3 (1.5)	524 (3.6)	-1 (1.3)	526 (3.6)	2 (1.6)
¹ Denmark	522 (2.6)	521 (2.7)	-2 (2.1)	520 (3.3)	-2 (1.6)	528 (2.7)	6 (1.7) ▲
¹³ Canada	521 (2.0)	527 (2.3)	6 (1.4) ▲	520 (2.5)	-1 (1.1)	515 (2.9)	-6 (1.7) ▼
Slovak Republic	521 (3.3)	524 (3.4)	4 (1.7)	520 (3.6)	-1 (1.2)	517 (4.6)	-4 (2.9)
²¹ New Zealand	517 (2.8)	520 (2.2)	3 (1.5)	514 (2.7)	-3 (1.7)	514 (3.1)	-3 (2.2)
¹ Netherlands	517 (2.9)	518 (3.1)	1 (2.2)	513 (2.5)	-4 (1.8)	520 (3.0)	3 (3.1)
Germany	515 (2.8)	515 (2.5)	-1 (1.3)	512 (2.7)	-4 (1.3) ▼	516 (2.9)	0 (2.6)
Portugal	511 (2.3)	506 (2.7)	-5 (1.4) ▼	511 (3.5)	0 (2.3)	512 (2.8)	1 (1.6)
² Italy	511 (2.5)	511 (2.9)	1 (1.3)	508 (2.8)	-2 (1.9)	506 (2.7)	-4 (1.4) ▼
² Serbia	510 (3.2)	501 (3.0)	-8 (1.7) ▼	514 (3.5)	4 (1.8)	514 (3.8)	4 (1.5) ▲
² Spain	504 (2.1)	508 (2.3)	4 (0.6) ▲	502 (2.0)	-3 (1.1)	498 (2.5)	-6 (1.6) ▼
United Arab Emirates	495 (1.8)	507 (1.6)	12 (0.7) ▲	492 (1.7)	-3 (0.5) ▼	481 (1.5)	-14 (0.6) ▼
²⁵ Albania	491 (4.5)	489 (4.8)	-2 (1.9)	487 (4.5)	-3 (1.6)	496 (5.3)	6 (2.6)
²¹ Belgium (Flemish)	488 (2.6)	488 (3.3)	0 (1.8)	485 (2.5)	-4 (1.3) ▼	497 (3.4)	9 (1.8) ▲
² France	488 (3.0)	491 (2.9)	3 (2.0)	487 (3.5)	-1 (1.7)	479 (3.5)	-9 (1.7) ▼
² Cyprus	487 (3.1)	480 (3.6)	-7 (2.0) ▼	493 (3.1)	6 (0.9) ▲	487 (2.9)	0 (1.9)
² Belgium (French)	481 (2.8)	478 (2.8)	-2 (1.6)	480 (3.1)	0 (1.7)	483 (2.5)	2 (2.1)
²¹ Chile	479 (2.7)	479 (3.2)	0 (1.7)	479 (2.5)	-1 (1.9)	477 (2.9)	-3 (2.4)
Bahrain	475 (3.9)	477 (4.4)	2 (1.6)	475 (3.9)	0 (2.0)	465 (4.1)	-10 (1.3) ▼
Qatar	472 (3.6)	476 (3.7)	4 (1.0) ▲	470 (3.7)	-2 (1.0)	464 (3.7)	-8 (1.3) ▼
² Kazakhstan	467 (3.5)	460 (4.1)	-6 (1.7) ▼	466 (3.7)	-1 (1.5)	475 (3.9)	9 (1.6) ▲
¹ Georgia	465 (3.4)	460 (4.5)	-5 (2.7)	461 (3.6)	-4 (2.1)	470 (3.1)	5 (2.1)
² Montenegro	461 (2.0)	454 (2.9)	-7 (1.9) ▼	463 (2.2)	3 (1.0) ▲	461 (2.9)	0 (1.6)
² Armenia	457 (2.7)	458 (3.2)	1 (1.9)	453 (2.4)	-4 (1.0) ▼	461 (2.4)	4 (1.6)
¹ Bosnia & Herzegovina	448 (3.7)	441 (3.3)	-7 (2.6) ▼	454 (3.8)	5 (2.8)	443 (3.9)	-5 (2.2)
North Macedonia	439 (3.9)	434 (4.3)	-5 (1.3) ▼	440 (3.4)	1 (1.6)	442 (4.8)	4 (2.8)
Oman	433 (4.2)	426 (4.4)	-7 (1.4) ▼	435 (4.4)	2 (1.2)	435 (4.0)	3 (1.4)
Iran, Islamic Rep. of	432 (4.5)	435 (4.6)	3 (1.9)	428 (4.5)	-4 (1.3) ▼	431 (4.2)	-1 (1.9)
³ Saudi Arabia	428 (4.0)	430 (4.7)	3 (1.8)	425 (4.1)	-2 (2.0)	424 (4.3)	-4 (1.4) ▼
² Brazil	425 (3.5)	427 (3.5)	2 (0.9)	420 (3.4)	-5 (0.9) ▼	427 (3.6)	2 (1.1)
Azerbaijan	422 (3.3)	425 (3.0)	4 (1.8)	416 (3.3)	-6 (2.8)	421 (3.5)	-1 (2.0)
Jordan	418 (4.9)	423 (5.4)	5 (1.8) ▲	412 (5.5)	-6 (1.9) ▼	409 (4.9)	-9 (2.3) ▼
Uzbekistan	412 (3.5)	415 (4.3)	3 (1.6)	406 (3.6)	-6 (2.4)	406 (3.2)	-6 (1.6) ▼
² Kosovo	403 (3.6)	399 (3.8)	-4 (2.0)	406 (3.6)	3 (2.1)	397 (3.2)	-6 (2.7)
Morocco	390 (5.3)	386 (5.7)	-4 (2.0)	381 (5.5)	-9 (1.7) ▼	398 (5.0)	7 (2.1) ▲
⁹ Kuwait	373 (5.5)	382 (5.6)	9 (1.6) ▲	356 (5.7)	-17 (1.5) ▼	353 (6.0)	-20 (1.8) ▼
³⁰ South Africa (5)	308 (4.7)	-	-	-	-	-	-
Benchmarking Participants							
Dubai, UAE	562 (1.8)	578 (1.7)	15 (1.1) ▲	561 (1.7)	-2 (1.0)	546 (1.8)	-16 (1.3) ▼
³ Ontario, Canada	525 (3.2)	532 (3.4)	6 (1.6) ▲	527 (3.5)	2 (1.4)	518 (4.1)	-7 (2.2) ▼
² Quebec, Canada	508 (2.7)	512 (2.8)	4 (1.4) ▲	502 (3.0)	-5 (1.3) ▼	504 (3.5)	-3 (1.9)
Sharjah, UAE	503 (3.9)	518 (4.1)	15 (1.9) ▲	500 (4.2)	-3 (1.7)	485 (3.6)	-18 (1.0) ▼
Abu Dhabi, UAE	446 (2.6)	454 (2.8)	8 (0.9) ▲	443 (2.4)	-3 (0.8) ▼	437 (2.2)	-9 (1.5) ▼

▲ ▼ Subscale score significantly different from overall score ($p < 0.01$)

Numbers of items are based on the TIMSS 2023 fourth-grade science items included in scaling.

() Standard errors appear in parentheses. Because of rounding some results may appear inconsistent.

See Appendix B.2 for population coverage notes 1, 2, and 3. See Appendix B.5 for sampling guidelines and sampling participation notes †, ‡, and =.

Ψ Reservations about reliability because the percentage of students with achievement too low for estimation exceeds 15% but does not exceed 25%.

✱ Average achievement not reliably measured because the percentage of students with achievement too low for estimation exceeds 25%.

A dash (-) indicates comparable data not available because average achievement could not be accurately estimated.

Grade 8 Science Achievement Distributions

Average Science Achievement and Scale Score Distributions (Grade 8)

The TIMSS 2023 eighth-grade science assessment was delivered fully digital and was based on a comprehensive [assessment framework](#) developed collaboratively with the participating countries to reflect their curricular goals. The eighth-grade science assessment included four content areas—biology (35%), chemistry (20%), physics (25%), and earth science (20%). The framework prescribed that the science items assessed eighth-grade students in the three cognitive domains: knowing (35%), applying (35%), and reasoning (30%). To cover the framework at the eighth grade, the assessment comprised 218 items distributed across 14 item blocks with an average of 15–16 items per block.

The 2023 cycle marked the full transition to a computer-based assessment system, incorporating an [adaptive booklet rotation](#) rotation to balance the proportion of more and less difficult booklets for countries with very high or very low expected average achievement. The 2023 assessment was carefully designed using a balanced incomplete block design, adhering to industry standards, and analyzed with state-of-the-art psychometric models. Consequently, the TIMSS 2023 science achievement results for all 44 countries and 3 benchmarking participants are reported on the same TIMSS eighth-grade science scale. The TIMSS eighth-grade science achievement scale was established in TIMSS 1995, based on the achievement data across all participating countries, treating each country equally. A centerpoint of 500 was set to correspond to the mean of overall achievement in 1995, with 100 points set to correspond to the standard deviation. Students' achievement is placed on the scale with each subsequent TIMSS cycle, most recently for TIMSS 2023.

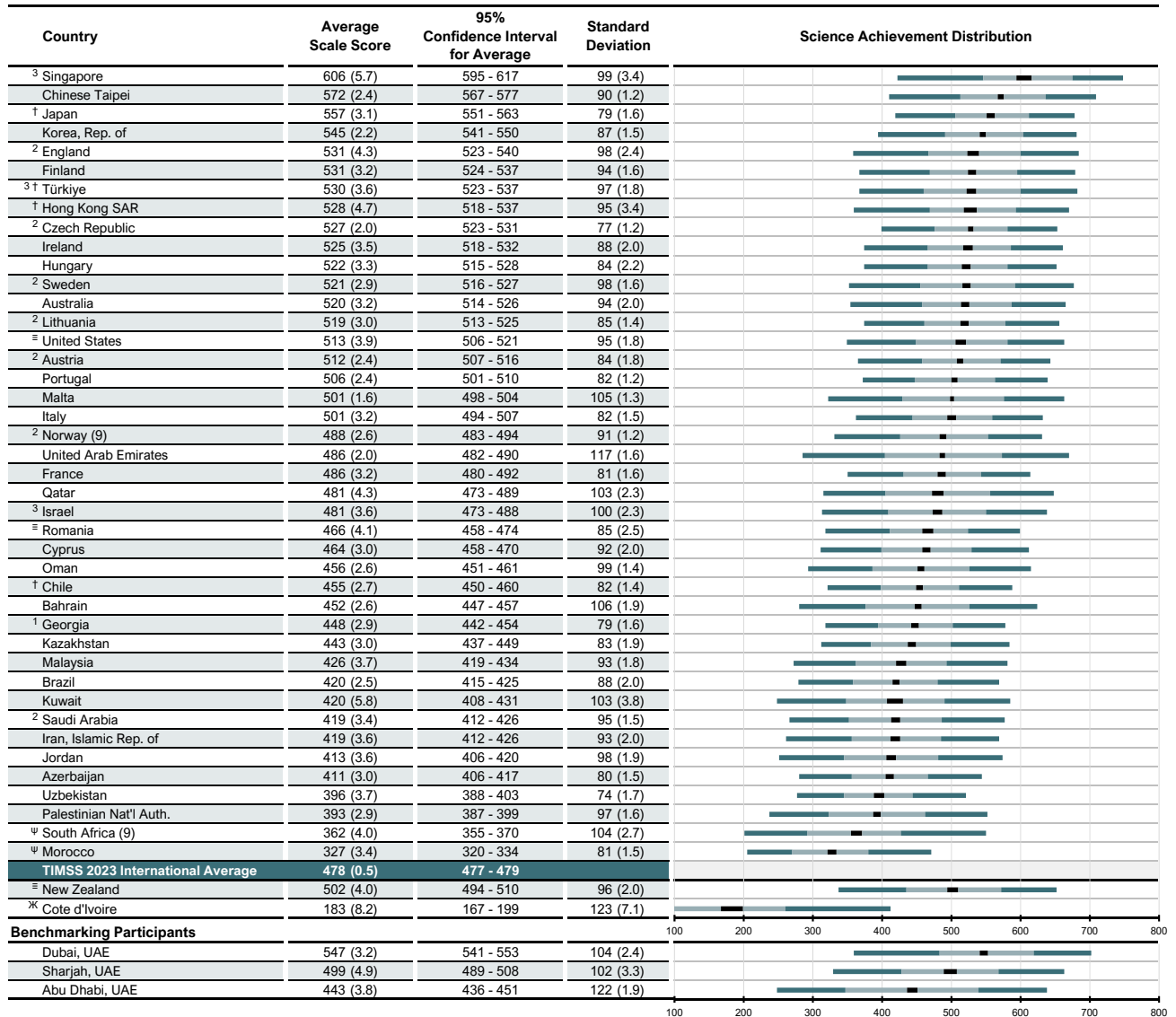
Exhibit 2.2.1 reports the average science achievement estimates at the eighth grade for each of the 44 TIMSS 2023 participating countries and 3 benchmarking entities. The exhibit also presents the corresponding confidence intervals, and standard deviations for each country, together with the associated standard errors for these estimates (given in parentheses). Additionally, it includes a visualization of the score distribution, illustrating percentiles of the distribution and the confidence interval of the average achievement. The exhibit includes an international average of the mean and confidence interval estimated based on the 42 countries that participated in TIMSS 2023 with comparable data, with each country contributing equally. The standard error of this estimate reflects the variance of the international average achievement based on these countries. New Zealand and Côte d'Ivoire are reported below a line and do not contribute to the international average in eighth grade achievement exhibits. New Zealand did not meet minimum standards for school participation rates and Côte d'Ivoire's achievement could not be reliably estimated.

The exhibit is interactive and can be sorted by different criteria, with average achievement used as the default. Sorted by average achievement, the exhibit shows that the country with the highest estimated average achievement is Singapore, followed by Chinese Taipei, then Japan, and then Korea. Average achievement is high in these countries. For example, Korea has an average achievement of 545 and the 95% confidence interval ranges from 541 to 550. The confidence interval provides a score range around the estimated mean that illustrates the uncertainty in this estimate, which is based on a sample of students taking the assessment in a random selection of classrooms within a sample of schools in each country. Intervals constructed in this way around the estimated average have a 95% chance to include the actual average of the country's achievement.

Notably, there is considerable variability in achievement not only across participants, but also within each country, as indicated by the standard deviation, the interquartile range, and the difference between the 10th and 90th percentiles of the achievement distribution shown in the table. Therefore, it would be incorrect to assume that (all) students in any country achieve higher scores than students in another country. While the average achievement of one country may be higher than the average achievement in another country, each country has some lower-achieving students and some higher-achieving students.

While examining the average achievement across countries can provide an overall initial impression of achievement in participating countries, the data collected by TIMSS 2023 and reported here is more comprehensive. TIMSS also provides information about the range of achievement observed in each country, and in later sections about associations with contextual factors, which provides a deeper understanding of student performance.

Exhibit 2.2.1: Average Science Achievement and Scale Score Distributions



The TIMSS achievement scale was established in 1995 based on the combined achievement distribution of all countries that participated in TIMSS 1995. To provide a point of reference for country comparisons, the scale centerpoint of 500 was located at the mean of the combined achievement distribution. The units of the scale were chosen so that 100 scale score points corresponded to the standard deviation of the combined achievement distribution.

() Standard errors appear in parentheses. Because of rounding some results may appear inconsistent.

See Appendix B.7 for population coverage notes 1, 2, and 3. See Appendix B.10 for sampling guidelines and sampling participation notes †, ‡, and Ξ.

Ψ Reservations about reliability because the percentage of students with achievement too low for estimation exceeds 15% but does not exceed 25%.

✕ Average achievement not reliably measured because the percentage of students with achievement too low for estimation exceeds 25%.

New Zealand did not satisfy guidelines for minimum school participation rates. Achievement could not be reliably estimated for Cote d'Ivoire.

SOURCE: IEA's Trends in International Mathematics and Science Study - TIMSS 2023
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Average Science Achievement for Girls and Boys (Grade 8)

Exhibit 2.2.2 shows the differences in average science achievement between eighth-grade girls and boys in the 44 countries and 3 benchmarking participants, along with the average achievement for each of these groups, together with their associated standard errors (given in parentheses). Countries are sorted by default according to the size of the achievement difference between boys and girls, where negative differences indicate girls' average achievement is higher than boys, and positive differences indicate boys had a higher average than girls. In TIMSS 2023, a range of gender differences can be observed across countries. Across the 42 countries with internationally comparable data, girls had higher average achievement than boys in 11 countries, boys had higher average achievement than girls in 12 countries, and 19 countries did not have average achievement differences significantly different from 0. It can be observed that differences of about 8-9 points or more tend to be flagged as statistically significant at an alpha level of 0.05. In contrast, smaller differences tend not to be flagged as significant, unless their standard error (given in parentheses) is unusually small. Statistical significance does not necessarily imply that a difference is practically meaningful and achievement differences between girls and boys should always be considered in broader educational contexts within countries.

Exhibit 2.2.2: Average Science Achievement for Girls and Boys

Country	Girls		Boys		Difference	Difference	
	Percent of Students	Average Scale Score	Percent of Students	Average Scale Score		Girls Scored Higher	Boys Scored Higher
Bahrain	49 (0.8)	472 (2.6)	51 (0.8)	432 (3.9)	-39 (4.0)		
Oman	48 (0.8)	476 (3.1)	52 (0.8)	437 (3.2)	-38 (3.8)		
² Saudi Arabia	48 (0.5)	438 (4.5)	52 (0.5)	402 (4.7)	-36 (6.1)		
Palestinian Nat'l Auth.	49 (2.7)	411 (3.9)	51 (2.7)	376 (4.0)	-35 (5.6)		
Kuwait	49 (1.4)	434 (5.0)	51 (1.4)	405 (9.3)	-29 (9.5)		
Jordan	48 (2.1)	424 (4.3)	52 (2.1)	403 (5.9)	-21 (7.6)		
^ψ South Africa (9)	51 (0.8)	370 (4.6)	49 (0.8)	355 (4.2)	-15 (3.7)		
Qatar	48 (2.1)	488 (4.9)	52 (2.1)	475 (5.7)	-13 (6.5)		
Cyprus	49 (0.7)	471 (3.6)	51 (0.7)	458 (3.6)	-13 (4.1)		
Iran, Islamic Rep. of	49 (1.4)	423 (5.3)	51 (1.4)	415 (5.2)	-8 (7.7)		
Finland	49 (0.9)	534 (3.5)	51 (0.9)	527 (3.5)	-7 (3.1)		
³ † Türkiye	51 (1.7)	533 (3.8)	49 (1.7)	526 (5.0)	-7 (5.2)		
Azerbaijan	48 (0.8)	414 (3.1)	52 (0.8)	408 (3.5)	-6 (2.9)		
United Arab Emirates	49 (0.4)	489 (2.0)	51 (0.4)	484 (2.8)	-5 (2.6)		
Malaysia	52 (1.1)	428 (4.0)	48 (1.1)	424 (4.1)	-4 (3.3)		
¹ Georgia	49 (0.8)	450 (3.4)	51 (0.8)	446 (3.0)	-4 (2.7)		
² Lithuania	50 (0.8)	521 (2.7)	50 (0.8)	518 (4.0)	-3 (3.2)		
Chinese Taipei	48 (0.8)	573 (2.6)	52 (0.8)	571 (3.2)	-2 (3.5)		
² Norway (9)	47 (0.7)	490 (2.9)	53 (0.7)	487 (3.2)	-2 (3.2)		
[≡] Romania	48 (1.1)	467 (4.3)	52 (1.1)	465 (4.7)	-2 (4.0)		
^ψ Morocco	50 (0.6)	327 (3.5)	50 (0.6)	327 (4.2)	-1 (3.7)		
² Sweden	49 (0.7)	521 (3.4)	51 (0.7)	521 (3.5)	0 (3.6)		
Malta	50 (0.7)	501 (2.2)	50 (0.7)	501 (2.7)	0 (3.7)		
³ Israel	50 (1.0)	480 (3.9)	50 (1.0)	481 (4.4)	1 (4.0)		
Uzbekistan	50 (0.9)	395 (3.0)	50 (0.9)	396 (5.1)	1 (3.9)		
Kazakhstan	47 (0.8)	442 (3.4)	53 (0.8)	443 (3.2)	1 (2.6)		
France	50 (0.7)	484 (3.5)	50 (0.7)	489 (3.6)	5 (3.2)		
Korea, Rep. of	49 (1.0)	543 (2.8)	51 (1.0)	548 (2.7)	5 (3.1)		
² Austria	49 (1.0)	509 (2.8)	51 (1.0)	515 (2.8)	6 (3.0)		
³ Singapore	48 (2.3)	603 (6.6)	52 (2.3)	609 (7.9)	7 (9.2)		
[†] Hong Kong SAR	49 (1.6)	523 (5.9)	51 (1.6)	532 (5.4)	9 (6.0)		
Ireland	47 (1.6)	520 (4.2)	53 (1.6)	529 (3.9)	9 (4.0)		
Portugal	49 (1.0)	501 (3.1)	51 (1.0)	510 (2.6)	9 (3.1)		
Italy	49 (0.7)	496 (3.6)	51 (0.7)	505 (3.7)	10 (3.5)		
[≡] United States	49 (0.7)	508 (4.0)	51 (0.7)	519 (4.2)	11 (3.0)		
² Czech Republic	48 (0.7)	521 (2.3)	52 (0.7)	533 (2.3)	12 (2.1)		
[†] Japan	49 (1.3)	551 (4.0)	51 (1.3)	563 (3.4)	12 (4.3)		
Hungary	50 (1.0)	515 (3.3)	50 (1.0)	528 (4.2)	13 (3.9)		
Australia	47 (1.7)	513 (4.1)	53 (1.7)	526 (3.8)	13 (4.7)		
Brazil	50 (0.5)	413 (2.5)	50 (0.5)	427 (3.0)	14 (2.2)		
² England	50 (2.0)	524 (5.1)	50 (2.0)	538 (5.5)	14 (6.3)		
[†] Chile	49 (1.1)	448 (2.9)	51 (1.1)	462 (3.3)	14 (3.1)		
International Average	49 (0.2)	480 (0.6)	51 (0.2)	477 (0.7)	-3 (0.7)		
[✕] Cote d'Ivoire	49 (1.4)	175 (13.9)	51 (1.4)	191 (6.3)	16 (13.8)		
New Zealand	46 (1.7)	493 (4.7)	54 (1.7)	510 (5.8)	17 (7.0)		
Benchmarking Participants							
Abu Dhabi, UAE	50 (0.5)	447 (4.2)	50 (0.5)	440 (4.8)	-8 (4.9)		
Sharjah, UAE	50 (0.8)	502 (5.2)	50 (0.8)	495 (5.9)	-6 (5.1)		
Dubai, UAE	48 (0.7)	544 (3.3)	52 (0.7)	550 (4.4)	6 (4.7)		

Students' gender information was obtained from school tracking data.

() Standard errors appear in parentheses. Because of rounding some results may appear inconsistent.

See Appendix B.7 for population coverage notes 1, 2, and 3. See Appendix B.10 for sampling guidelines and sampling participation notes †, ‡, and ≡.

^ψ Reservations about reliability because the percentage of students with achievement too low for estimation exceeds 15% but does not exceed 25%.[✕] Average achievement not reliably measured because the percentage of students with achievement too low for estimation exceeds 25%.

New Zealand did not satisfy guidelines for minimum school participation rates. Achievement could not be reliably estimated for Cote d'Ivoire.

■ Difference statistically significant ($p < 0.05$)

■ Difference not statistically significant

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Grade 8 International Benchmarks of Science Achievement

International Benchmarks of Grade 8 Science Achievement

To understand what students at different points on the TIMSS achievement scale know and can do, it is important to examine the types of tasks students at certain defined points on the TIMSS achievement scale are likely to solve. For example, in terms of students' science skills, if it is found that a group of students has an average achievement of 550, what do these students know and what can they do, compared to students with an average achievement of 400? Looking at the proportion of students who can solve the TIMSS science items can help countries determine whether students at different levels along the scale have gained the science knowledge and practices covered in the science curriculum.

To provide more information about the range of achievement students show in the TIMSS eighth-grade science assessment, TIMSS reports percentages of students reaching four increasingly challenging points along the achievement scale, known as International Benchmarks: Low International Benchmark (400 scale score points), Intermediate International Benchmark (475), High International Benchmark (550), and Advanced International Benchmark (625). The TIMSS International Benchmarks build on each other, representing increasingly demanding science knowledge and skills with each higher benchmark. The students who reach a higher benchmark have also surpassed all lower benchmarks. For example, students who reached the Advanced Benchmark also surpassed the High, Intermediate, and Low Benchmarks.

Descriptions for each International Benchmark provide an interpretation of the achievement scale in relation to students' performance on the assessment items. For TIMSS 2023, the descriptions of science achievement at the International Benchmarks were updated from TIMSS 2019 based on a review and analysis of the items that students with average achievement at or above each of the benchmarks were likely to solve in TIMSS 2023 (see Chapter 14 in the *TIMSS 2023 Technical Report*).

Exhibit 2.2.3: Summary of TIMSS 2023 International Benchmarks of Science Achievement

	Advanced International Benchmark
625	<i>Students can show, apply, and reason with knowledge of concepts related to biology, chemistry, physics, and earth science in various contexts, and they can engage in more complex scientific practices.</i> Students show knowledge of cellular respiration, photosynthesis, and natural disasters. They can apply knowledge about the human immune system and reason about ancestry. Students show and can apply knowledge of atoms, molecules, acids and bases, and chemical reactions, and can reason about separating mixtures. Students show knowledge about unbalanced forces and can apply knowledge about friction and the properties of sound. They can reason about shadows. They show knowledge about the composition of Earth's oceans and atmosphere, Earth's processes and history, and Earth's resources and their uses. Students can describe one limitation of a model and design a fair test with multiple variables.
	High International Benchmark
550	<i>Students show and apply knowledge of concepts from biology, chemistry, physics, and earth science, and they engage in multiple scientific practices.</i> They show and apply knowledge of plant and animal cells, know simple facts about inheritance, and reason about simple population dynamics in an ecosystem. Students can apply knowledge of the human body and of the effects of human behavior on the environment. Students show some knowledge of subatomic particles and of chemical notation and can reason about a chemical reaction. They can apply knowledge of properties of matter, electromagnets, light absorption and reflection, and the direction of common forces. They demonstrate knowledge about the states of matter, the transfer of thermal energy, and energy transformation. Students show knowledge about light from the Sun and about Earth's resources. They can apply knowledge about the relationship between climate and both weather and weathering. Students can interpret patterns in data, reason with data and graphical information, explore relationships between variables, and predict outcomes.
	Intermediate International Benchmark
475	<i>Students can apply understanding of some concepts from biology, chemistry, physics, and earth science, and they engage in some scientific practices.</i> They can apply knowledge about health, energy flow in ecosystems, interactions among living things and with their environment, and reproduction and inheritance. Students can apply knowledge of some chemistry concepts, such as thermal and electrical conductivity, concentration of a solution, and chemical reactions. They show basic knowledge of states of matter, motion, and forces, and they apply knowledge of properties of materials and of light. Students show some knowledge of the physical structure of the Earth, the Earth-Moon-Sun system, and the water cycle. They can reason about Earth's climate and demonstrate knowledge of ways to manage Earth's natural resources. Students create a simple experimental design and a basic mathematical model. They interpret tables, graphs, and pictures, and they draw conclusions.
	Low International Benchmark
400	<i>Students show and apply knowledge of some science facts.</i> They show knowledge about cells, tissues, and organs and about some characteristics of animals. They apply some knowledge of ecosystems using models. Students distinguish between physical and chemical changes, and they show some knowledge related to dissolving. Students show basic knowledge about the physical properties of matter and about the form of energy a common device uses. Students know that ocean water contains salt and the Sun provides light and heat. Students can describe an observation and interpret a model.

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Exhibit 2.2.5: Description of the TIMSS 2023 Low International Benchmark (400) of Science Achievement



Low International Benchmark

400

Summary

Students show and apply knowledge of some science facts. They show knowledge about cells, tissues, and organs and about some characteristics of animals. They apply some knowledge of ecosystems using models. Students distinguish between physical and chemical changes, and they show some knowledge related to dissolving. Students show basic knowledge about the physical properties of matter and about the form of energy a common device uses. Students know that ocean water contains salt and the Sun provides light and heat. Students can describe an observation and interpret a model.

Students can identify cells as the basic unit of all living things. They know the functions of major tissues and organs. Students recognize common animals that lay eggs, and students have basic knowledge about features or behaviors that help mammals survive in cold weather.

Students can complete a food chain, interpret a food web, and place organisms into an energy pyramid. They can identify organisms that compete for food and predator-prey relationships in the food web. Students reason that the population of predators depends on the prey population and vice versa.

Students can distinguish between physical and chemical changes. They show knowledge of multiple ways to increase the rate at which solutes dissolve. Students can determine mass using a balance.

Students can apply knowledge about which materials are attracted to a magnet. They recognize the phase change that occurs when thermal energy is added to liquid water and the relative distance between particles in a gas. They recognize the type of energy a common device uses and the property that explains floating and sinking.

Students show knowledge that salt must be removed from clean ocean water to make it safe to drink and that the Sun provides light and heat.

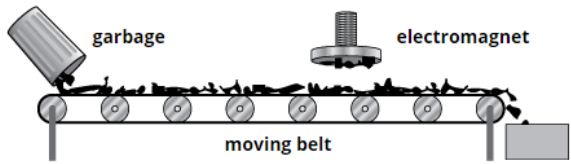
Students can describe an observation and interpret a model.

SOURCE: IEA's Trends in International Mathematics and Science Study - TIMSS 2023
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TIMSS & PIRLS
BOSTON COLLEGE

Content Domain: Physics
 Cognitive Domain: Applying
 Description: Recognizes whether an electromagnet would attract objects made of various materials

The diagram shows garbage being dumped onto a moving belt. Some of the garbage is being removed by an electromagnet and the rest falls into the box.



What happens to each of the following materials?
 (Click one circle in each row.)

	Removed by the electromagnet	Fall into the box
steel cans	☒ A	☐ B
plastic cups	☐ A	☒ B
aluminum cans	☐ A	☒ B
newspapers	☐ A	☒ B
iron nails	☒ A	☐ B

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Exhibit 2.2.6: Description of the TIMSS 2023 Intermediate International Benchmark (475) of Science Achievement

Intermediate International Benchmark
475 Summary

Students can apply understanding of some concepts from biology, chemistry, physics, and earth science, and they engage in some scientific practices. They can apply knowledge about health, energy flow in ecosystems, interactions among living things and with their environment, and reproduction and inheritance. Students can apply knowledge of some chemistry concepts, such as thermal and electrical conductivity, concentration of a solution, and chemical reactions. They show basic knowledge of states of matter, motion, and forces, and they apply knowledge of properties of materials and of light. Students show some knowledge of the physical structure of the Earth, the Earth-Moon-Sun system, and the water cycle. They can reason about Earth's climate and demonstrate knowledge of ways to manage Earth's natural resources. Students create a simple experimental design and a basic mathematical model. They interpret tables, graphs, and pictures, and they draw conclusions.

Students can identify producers and primary consumers in a food web and apply basic knowledge of energy flow through the energy pyramid. They can apply knowledge about the interactions among living things and with their environment and demonstrate knowledge of the characteristics of plants, animals, and their environmental adaptations. Students can distinguish between inherited animal characteristics from those acquired. They can identify the reproductive organ in flowering plants and the chloroplast as a distinguishing structure between plant and animal cells. Students can complete a simplified diagram of the oxygen-carbon dioxide cycle. They can apply knowledge about a healthy diet and identify some behaviors associated with health or developing common diseases.

Students can relate the use of a material to its thermal conductivity. They can reason about the concentration of a solution based on the amounts of solute and solvent. Students can recognize that a chemical reaction can produce gases and that the rate of reaction in a common context can be increased by increasing surface area.

Students apply knowledge of heat and electrical conduction to separate insulators from conductors. They can relate some knowledge of magnetic force to an everyday context, and they reason about the reflection of light. Students can recognize the state of water at different temperatures and name the changes in states of water. Students can show knowledge of balanced forces in floating and sinking and the direction of the force of gravity. Students can recognize constant speed as a steady change of distance over time.

Students can state the motion of Earth that results in day and night, relate a phase of the Moon to its relative position to the Earth, and know the primary component of Earth's crust. They can apply some knowledge of rainfall and temperature in different climates, show knowledge of the processes in the Earth's water cycle, and identify evidence (other than temperature data) of an increasing global temperature. Students can identify renewable energy sources and classify some human activities as reducing, reusing, or recycling.

Students can interpret tabular and graphical information, reason with pictorial information, create an experimental design, model a physical situation using a simple mathematical formula, and draw conclusions.

SOURCE: IEA's Trends in International Mathematics and Science Study - TIMSS 2023
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**Exhibit 2.2.6a: TIMSS 2023 Intermediate International Benchmark (475) of Science Achievement –
Example Item 1****Content Domain:** Biology**Cognitive Domain:** Reasoning**Description:** Justifies an advantage of hollow bones for birds

The bones of birds are hollow.

What advantage do hollow bones give to birds?

Hollow bones make it easier for birds to fly

The answer shown illustrates one type of response that would receive full credit.
Other types of correct responses are possible as defined by the item's unique scoring guide.

SOURCE: IEA's Trends in International Mathematics and Science Study - TIMSS 2023
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**Exhibit 2.2.6b: TIMSS 2023 Intermediate International Benchmark (475) of Science Achievement –
Example Item 2****Content Domain:** Biology**Cognitive Domain:** Knowing**Description:** Recognizes characteristics inherited by rabbits in a given context

Francisco is a farmer who raises rabbits. He breeds a female rabbit and a male rabbit. A litter of 10 young rabbits is produced.

Which of the following best describes the characteristics of the young rabbits?

- ☐ **A** About half of the young rabbits will look like the female rabbit, and about half of them will look like the male rabbit.
- ☐ **B** All of the young rabbits will look just like the female rabbit because young rabbits inherit their traits from their mother.
- ☐ **C** All of the young rabbits will look just like the male rabbit because male traits are dominant.
- ☒ **D** All of the young rabbits will look like the female rabbit in some ways and like the male rabbit in some ways.

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Exhibit 2.2.7: Description of the TIMSS 2023 High International Benchmark (550) of Science Achievement

 High International Benchmark

550 Summary

Students show and apply knowledge of concepts from biology, chemistry, physics, and earth science, and they engage in multiple scientific practices. They show and apply knowledge of plant and animal cells, know simple facts about inheritance, and reason about simple population dynamics in an ecosystem. Students can apply knowledge of the human body and of the effects of human behavior on the environment. Students show some knowledge of subatomic particles and of chemical notation and can reason about a chemical reaction. They can apply knowledge of properties of matter, electromagnets, light absorption and reflection, and the direction of common forces. They demonstrate knowledge about the states of matter, the transfer of thermal energy, and energy transformation. Students show knowledge about light from the Sun and about Earth's resources. They can apply knowledge about the relationship between climate and both weather and weathering. Students can interpret patterns in data, reason with data and graphical information, explore relationships between variables, and predict outcomes.

Students can identify the functions of different human cell types and recognize what happens to animal cells as they grow. They can apply knowledge of a distinguishing structure between plant and animal cells, and they know the part of a plant that passes genetic information to its offspring. Students can identify the defining characteristics that differentiate between animals from major taxonomic groups. Students can reason about how changes in an ecosystem affect the dynamics of prey and predator populations. They can apply knowledge of the body's immune system to contracting a common disease, and they reason about the human body's physiological responses. Students can locate major organs in systems of the human body. They can apply knowledge about positive or negative effects of human behavior on the environment.

Students can relate the use of a material to its thermal properties. They show some knowledge of the three types of subatomic particles and can interpret a chemical formula. They can interpret information in a table to determine the density of a metal and they provide one variable that should be held constant during an investigation of reactivity. They can reason about a chemical reaction between two reactants that were used up.

Students can apply knowledge about the properties of electromagnets, the absorption and reflection of different colors of light, the direction of common forces (weight, buoyant force, air resistance), and density. They can identify the states of matter of various materials at room temperature and they relate the rate of change of state to the size of the object. They can recognize the way temperature changes over time in an object that is warmer or cooler than its surroundings. They can recognize energy transformation involving kinetic and chemical energy.

Students can recognize how the Sun produces its own light and how that light makes planets visible from Earth. They can recognize an effect of forest clearing and that the release of a greenhouse gas can affect Earth's climate. They can identify advantages and disadvantages of different energy sources. They can relate climatic conditions to the weathering of rocks, and they can relate temperature data to the hemisphere and proximity to the ocean. Students can apply knowledge about rainfall and temperature in different climates.

Students can interpret patterns in data, reason with quantitative data and graphical information, explore relationships between variables, use a model, and predict outcomes.

SOURCE: IEA's Trends in International Mathematics and Science Study - TIMSS 2023
Downloaded from <https://timss2023.org/results>

Exhibit 2.2.7a: TIMSS 2023 High International Benchmark (550) of Science Achievement – Example Item 1

Content Domain: Chemistry**Cognitive Domain:** Knowing**Description:** Identifies the number of atoms of each element in nitric acid

Complete the table below to show the number of atoms of each element needed to form a molecule of nitric acid (HNO_3).

Element	Number of atoms
Hydrogen (H)	1
Nitrogen (N)	1
Oxygen (O)	3

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Downloaded from <https://timss2023.org/results>

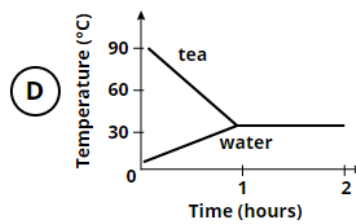
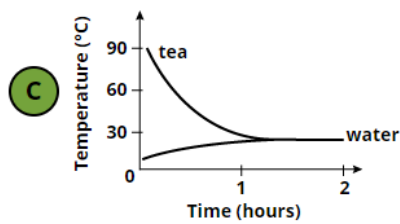
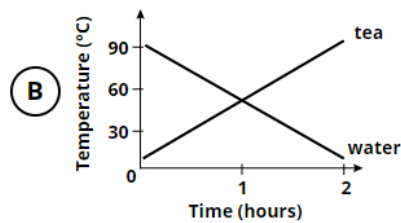
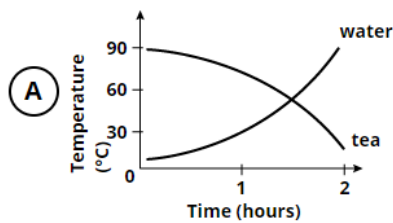
Exhibit 2.2.7b: TIMSS 2023 High International Benchmark (550) of Science Achievement – Example Item 2

Content Domain: Physics

Cognitive Domain: Applying

Description: Relates knowledge of heat transfer to recognize a graph that shows how two substances eventually reach temperature equilibrium

Lucy placed a glass of hot tea next to a glass of cold water on the table. Which of the graphs shows how the temperatures of the tea and the water changed over the next two hours? Assume the temperature in the room is 25°C .



SOURCE: IEA's Trends in International Mathematics and Science Study - TIMSS 2023
Downloaded from <https://timss2023.org/results>

IEA TIMSS & PIRLS
BOSTON COLLEGE

Exhibit 2.2.8: Description of the TIMSS 2023 Advanced International Benchmark (625) of Science Achievement

	Advanced International Benchmark
625	Summary <i>Students can show, apply, and reason with knowledge of concepts related to biology, chemistry, physics, and earth science in various contexts, and they can engage in more complex scientific practices.</i> Students show knowledge of cellular respiration, photosynthesis, and natural disasters. They can apply knowledge about the human immune system and reason about ancestry. Students show and can apply knowledge of atoms, molecules, acids and bases, and chemical reactions, and can reason about separating mixtures. Students show knowledge about unbalanced forces and can apply knowledge about friction and the properties of sound. They can reason about shadows. They show knowledge about the composition of Earth's oceans and atmosphere, Earth's processes and history, and Earth's resources and their uses. Students can describe one limitation of a model and design a fair test with multiple variables. Students show some knowledge about the components and function of the human immune system and can apply knowledge about how vaccination affects it. They can apply basic knowledge of cellular respiration and photosynthesis, and they can reason using evidence of common ancestry. They can apply knowledge about how natural disasters affect human life. Students show knowledge of the arrangement of subatomic particles, and they can use a model to describe molecules as combinations of atoms. They can apply knowledge of the number of protons in the nuclei to complete the periodic table and to predict the location of elements based on their properties. They can recognize that the composition of an object affects the amount of rust produced, and whether substances are an acid or a base based on their pH value or a color indicator. They show knowledge of categories of substances that react with acid. They can reason about physical methods that can be used to separate mixtures into their components. Students show knowledge of several factors that can affect a reaction rate, and they can recognize that new chemical bonds form after a chemical reaction. Students show knowledge about unbalanced forces in floating and sinking and about forces and distances in a simple machine. They show knowledge about the comparison of the mass, force of gravity on, and motion of an object on the Earth and on the Moon. They can recognize acceleration as an increasing change of distance over time. They can apply knowledge about friction and the properties of sound in different contexts, of permanent magnets, of gases and liquids in a laboratory setting, and of molecules in solids. Students can reason about the formation of shadows. Students can recognize that salt water is found only in the ocean and that nitrogen makes up most of the Earth's atmosphere. They can identify the relationship between altitude and temperature in the Earth's atmosphere. Students can identify the processes of changes to the Earth's surface and the formation of fossil fuels. They can explain how trees can prevent flooding and identify a negative effect of human activity on the environment. Students can describe one limitation of a model and design a fair test with multiple variables.

SOURCE: IEA's Trends in International Mathematics and Science Study - TIMSS 2023
Downloaded from <https://timss2023.org/results>

Content Domain: Earth Science**Cognitive Domain:** Knowing**Description:** Recognizes the gas that makes up most of Earth's atmosphere

Which of the following gases makes up most of Earth's atmosphere?

- ☒ A nitrogen
- ☐ B oxygen
- ☐ C water vapor
- ☐ D carbon dioxide

SOURCE: IEA's Trends in International Mathematics and Science Study - TIMSS 2023
Downloaded from <https://timss2023.org/results>

Content Domain: Chemistry**Cognitive Domain:** Applying**Description:** Identifies and explains whether a described change is physical or chemical

An iron object is changing color and small bits of material are flaking off of the object's surface.

Is the process that is affecting the iron object a physical change or a chemical change?

(Click one box.)

☐

physical change

☒

chemical change

Explain your answer.

The iron changed color and new products are formed.

The answer shown illustrates one type of response that would receive full credit.
Other types of correct responses are possible as defined by the item's unique scoring guide.

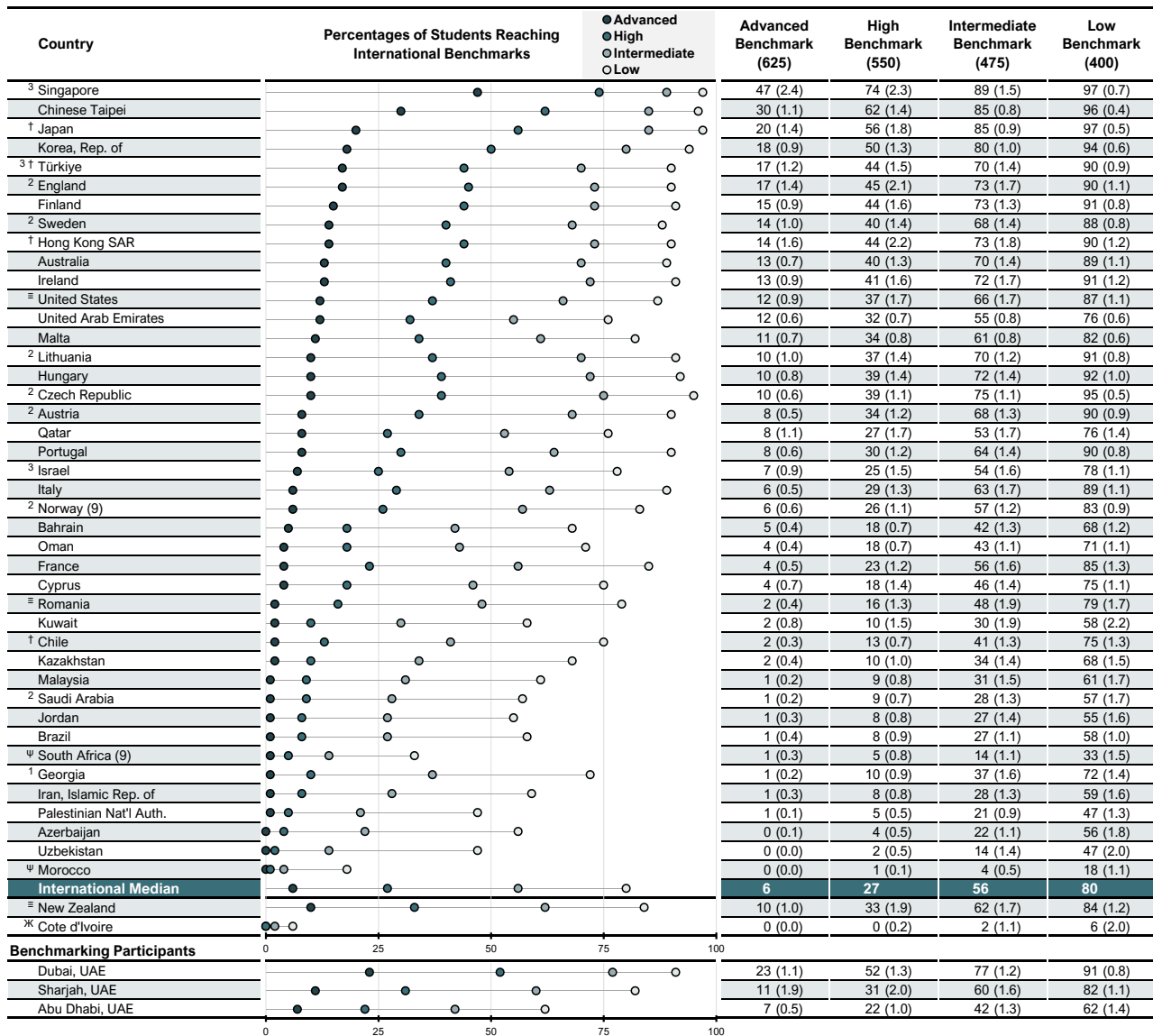
Percentages of Students Reaching International Benchmarks of Science Achievement (Grade 8)

Exhibit 2.2.4 provides graphical and numerical representations of the percentages of eighth-grade students reaching each TIMSS 2023 International Benchmark in participating countries and benchmarking entities. The International Benchmarks function like steps on a ladder: If students reached a higher benchmark, they also reached each of the lower benchmarks. The percentages do not add up to 100%, but rather indicate cumulative proportions: The lower the benchmark, the higher the proportion of students reaching that benchmark. Conversely, the higher the benchmark, the lower the proportion of students reaching it. The exhibit also provides the standard error (in parentheses) associated with each of the estimated percentages.

As a point of reference, the exhibit reports the international median of the percentage of students reaching each International Benchmark across 42 participating countries with internationally comparable data, instead of an average as is displayed in other report exhibits for average achievement. By definition, half of the countries will have a percentage in the column above the median and half will be below the median.

In TIMSS 2023, the percentage of eighth-grade students reaching the Advanced Benchmark ranged from 47 percent to 0 percent. The majority of countries had fewer than 20 percent of students reaching the Advanced Benchmark. Across the 42 countries, the median percentages of students reaching each benchmark were 6 percent at the Advanced Benchmark, 27 percent at High, 56 percent at Intermediate, and 80 percent at Low. The percentage of students reaching the Low Benchmark ranged from 97 percent to 18 percent. In 14 countries, 90 percent or more of the eighth-grade students internationally reached the Low Benchmark, which can be considered a level of minimum science proficiency. Five additional countries had at least 85 percent but fewer with than 90 percent of students reaching the Low Benchmark. The exhibit allows sorting by percentage of students reaching each International Benchmark and selecting groups of countries, facilitating the examination of relative differences in the percentages of students reaching the different levels of proficiency described by the TIMSS 2023 International Benchmarks.

Exhibit 2.2.4: Percentages of Students Reaching the TIMSS International Benchmarks of Science Achievement



() Standard errors appear in parentheses. Because of rounding some results may appear inconsistent.

See Appendix B.7 for population coverage notes 1, 2, and 3. See Appendix B.10 for sampling guidelines and sampling participation notes †, ‡, and ≡.

^ψ Reservations about reliability because the percentage of students with achievement too low for estimation exceeds 15% but does not exceed 25%.

[✕] Average achievement not reliably measured because the percentage of students with achievement too low for estimation exceeds 25%.

New Zealand did not satisfy guidelines for minimum school participation rates. Achievement could not be reliably estimated for Cote d'Ivoire.

SOURCE: IEA's Trends in International Mathematics and Science Study - TIMSS 2023
Downloaded from <https://timss2023.org/results>

Grade 8 Trends in Science Achievement

Trends in Science Achievement (Grade 8)

The eighth-grade TIMSS science achievement scale was established in TIMSS 1995, based on the achievement across all participating countries. In 1995, the international mean was set to 500, and the international standard deviation was set to 100, providing the origin of the TIMSS trend scale. Students' achievement was placed on the same scale with each subsequent TIMSS cycle, most recently for TIMSS 2023. Reporting the achievement data from each TIMSS assessment on the TIMSS trend scale enables monitoring increases or decreases in achievement across assessment cycles.

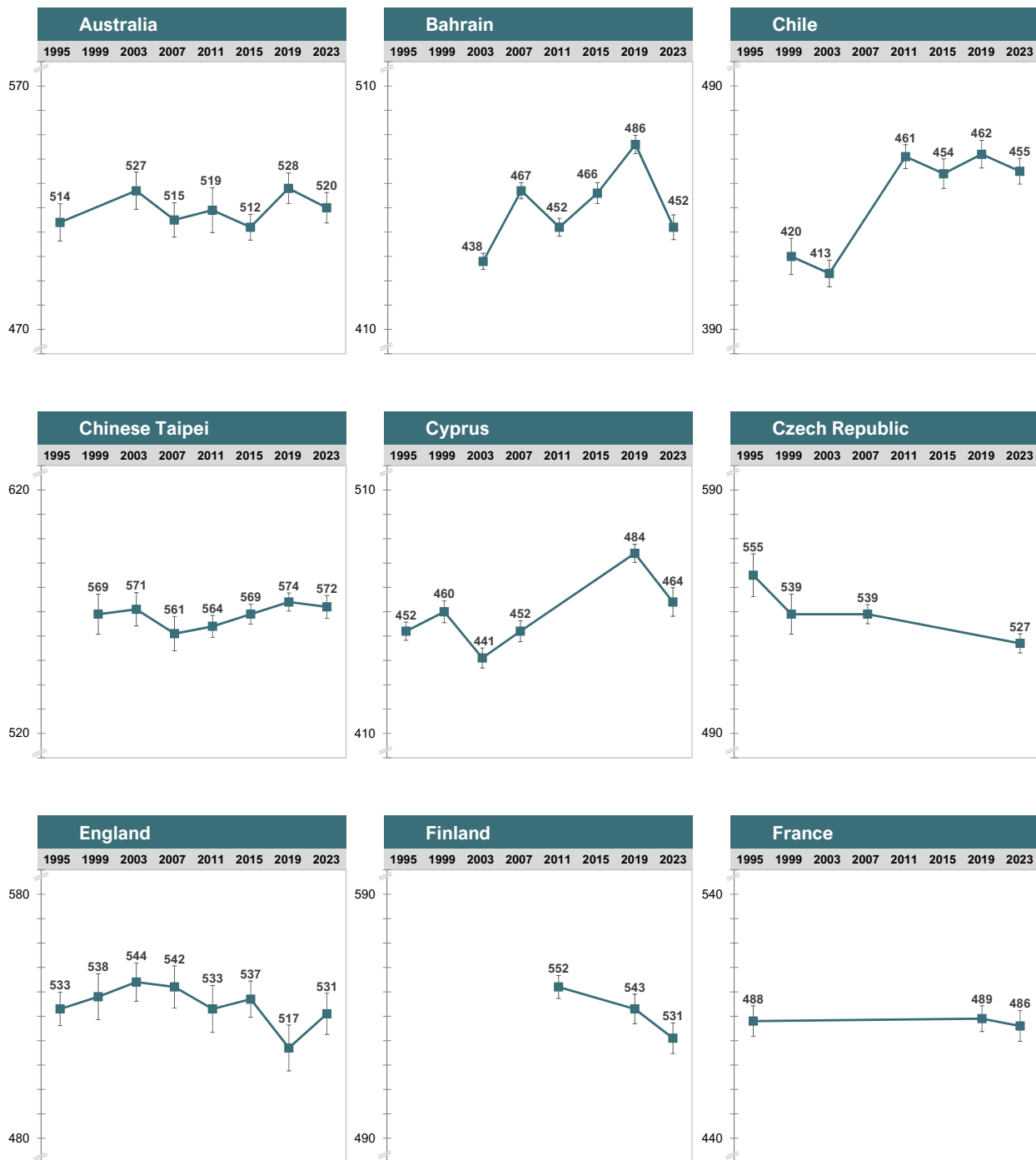
Exhibit 2.2.9 displays changes in achievement across assessment years for the countries and benchmarking participants that have participated in prior cycles of TIMSS. The trend graphs include a graphical representation of the 95% confidence interval around each cycle mean, depicted as small error bars above and below the average achievement estimate. Confidence intervals of this width around the sample mean have a 95% probability to include the true country average under repeated sampling. Users can select individual countries, groups of countries, or all countries that participated for customized displays of trends.

Across the (up to) 8 time points spanning the years from 1995 to 2023, many countries that participated multiple times have had some periods of increases or decreases in average achievement as well as periods of stability. It can be seen that even if estimates of average achievement may be lower or higher for adjacent years, the confidence intervals overlap quite frequently. In cases of larger differences with little or no overlap of confidence intervals, the trends over time indicate more noticeable changes of larger magnitude.

Exhibit 2.2.10 extends the results of Exhibit 2.2.9, providing more detail about the achievement distributions across assessment cycles and the differences in average achievement between each previous TIMSS cycle and TIMSS 2023. Symbols are used to indicate if an estimate obtained in a prior TIMSS cycle shows a statistically significant difference compared to TIMSS 2023. The direction of the up or down arrow shows whether the previous estimate is higher or lower than the estimate obtained in 2023. For the 34 countries with comparable data in TIMSS 2019, 3 showed an increase in average science achievement, 15 showed a decrease, and 16 had no change. Confidence intervals for the average achievement of each cycle are reported, corresponding to the error bars in the trend graphs in Exhibit 2.2.9. The graphical depiction of the percentiles provides a visualization of the distribution and shows the range of achievement that is observed in each cycle. The overlap of these visual representations of achievement distributions provides a reference for the magnitude of changes observed across TIMSS cycles.

Exhibit 2.2.9: Trend Plots of Average Science Achievement

This exhibit displays changes in achievement across assessment years for the countries and benchmarking participants that have comparable data from previous TIMSS assessments. The accompanying table (Exhibit 2.2.10) provides details. The scale interval is 10 points for each country, but a different part of the scale is shown according to each country's average achievement. See Appendix A for country participation in previous assessments.



See Appendix A for country participation in previous TIMSS assessments.

The scale interval is 10 points for each country, but a different part of the scale is shown according to each country's average achievement.

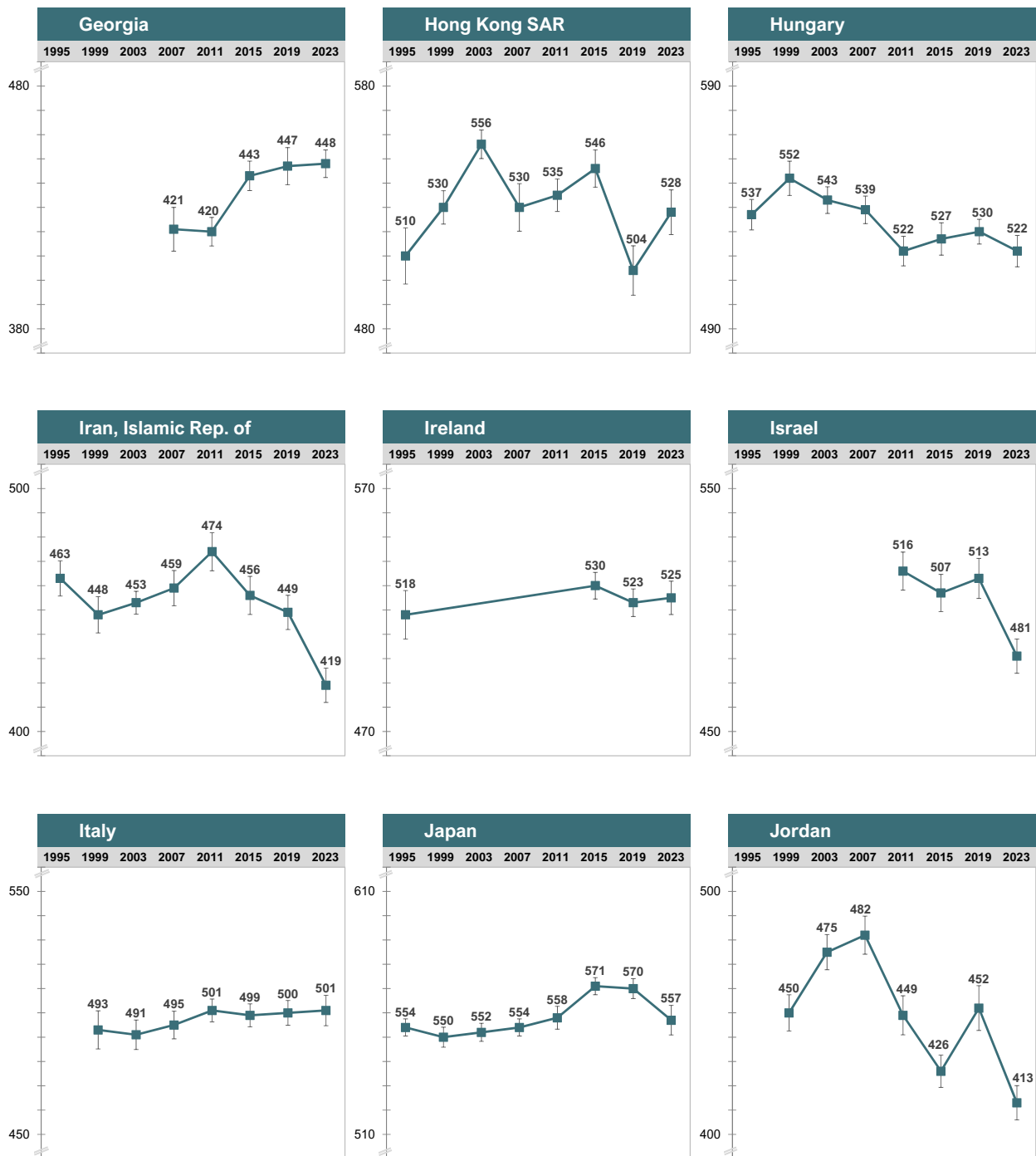
I The black bars represent the 95% confidence interval.

SOURCE: IEA's Trends in International Mathematics and Science Study - TIMSS 2023
Downloaded from <https://timss2023.org/results>

Exhibit 2.2.9: Trend Plots of Average Science Achievement

(Continued)

This exhibit displays changes in achievement across assessment years for the countries and benchmarking participants that have comparable data from previous TIMSS assessments. The accompanying table (Exhibit 2.2.10) provides details. The scale interval is 10 points for each country, but a different part of the scale is shown according to each country's average achievement. See Appendix A for country participation in previous assessments.



See Appendix A for country participation in previous TIMSS assessments.

The scale interval is 10 points for each country, but a different part of the scale is shown according to each country's average achievement.

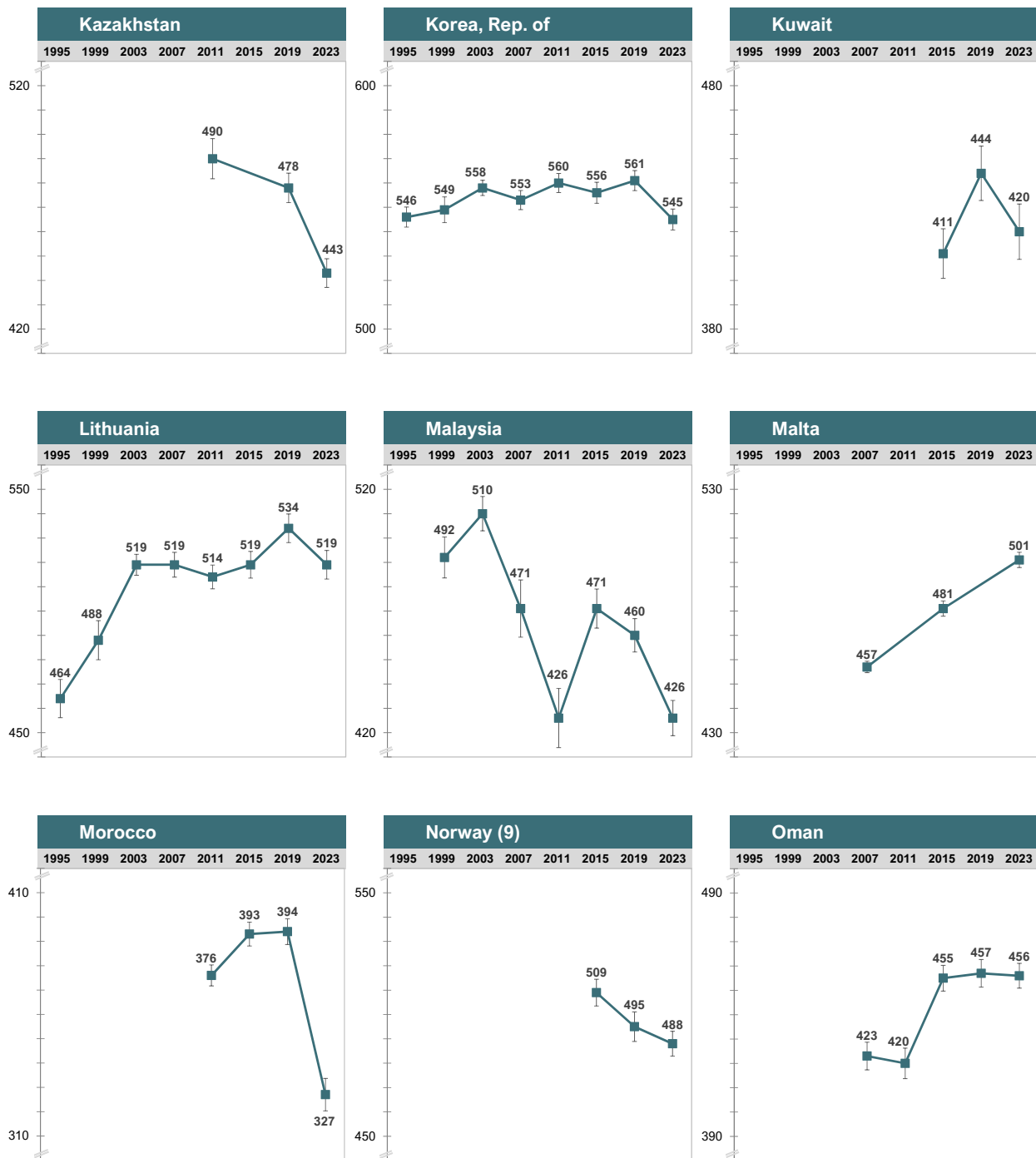
I The black bars represent the 95% confidence interval.

SOURCE: IEA's Trends in International Mathematics and Science Study - TIMSS 2023
Downloaded from <https://timss2023.org/results>

Exhibit 2.2.9: Trend Plots of Average Science Achievement

(Continued)

This exhibit displays changes in achievement across assessment years for the countries and benchmarking participants that have comparable data from previous TIMSS assessments. The accompanying table (Exhibit 2.2.10) provides details. The scale interval is 10 points for each country, but a different part of the scale is shown according to each country's average achievement. See Appendix A for country participation in previous assessments.



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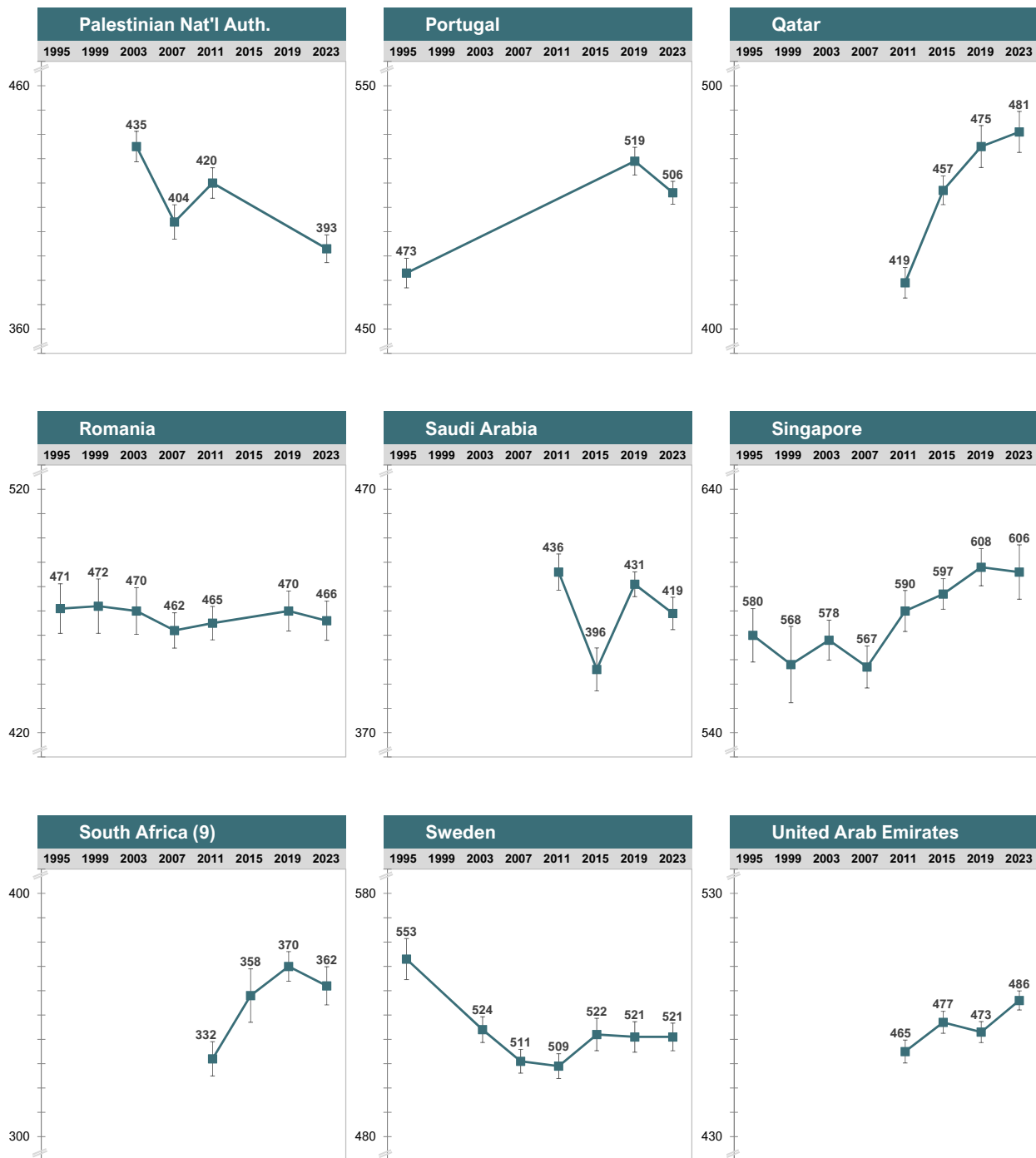
■ The black bars represent the 95% confidence interval.

SOURCE: IEA's Trends in International Mathematics and Science Study - TIMSS 2023
Downloaded from <https://timss2023.org/results>

Exhibit 2.2.9: Trend Plots of Average Science Achievement

(Continued)

This exhibit displays changes in achievement across assessment years for the countries and benchmarking participants that have comparable data from previous TIMSS assessments. The accompanying table (Exhibit 2.2.10) provides details. The scale interval is 10 points for each country, but a different part of the scale is shown according to each country's average achievement. See Appendix A for country participation in previous assessments.



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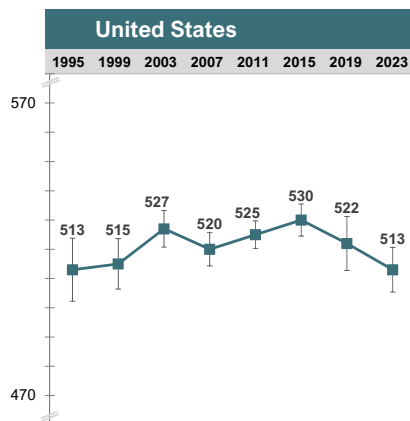
I The black bars represent the 95% confidence interval.

SOURCE: IEA's Trends in International Mathematics and Science Study - TIMSS 2023
Downloaded from <https://timss2023.org/results>

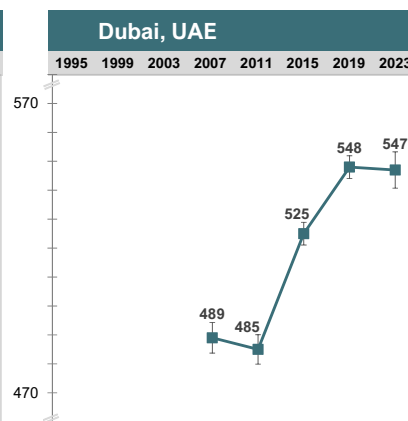
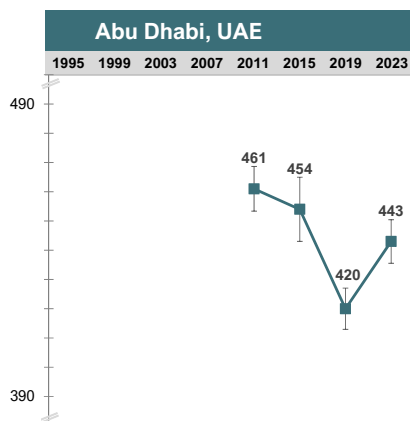
Exhibit 2.2.9: Trend Plots of Average Science Achievement

(Continued)

This exhibit displays changes in achievement across assessment years for the countries and benchmarking participants that have comparable data from previous TIMSS assessments. The accompanying table (Exhibit 2.2.10) provides details. The scale interval is 10 points for each country, but a different part of the scale is shown according to each country's average achievement. See Appendix A for country participation in previous assessments.



Benchmarking Participants



See Appendix A for country participation in previous TIMSS assessments.

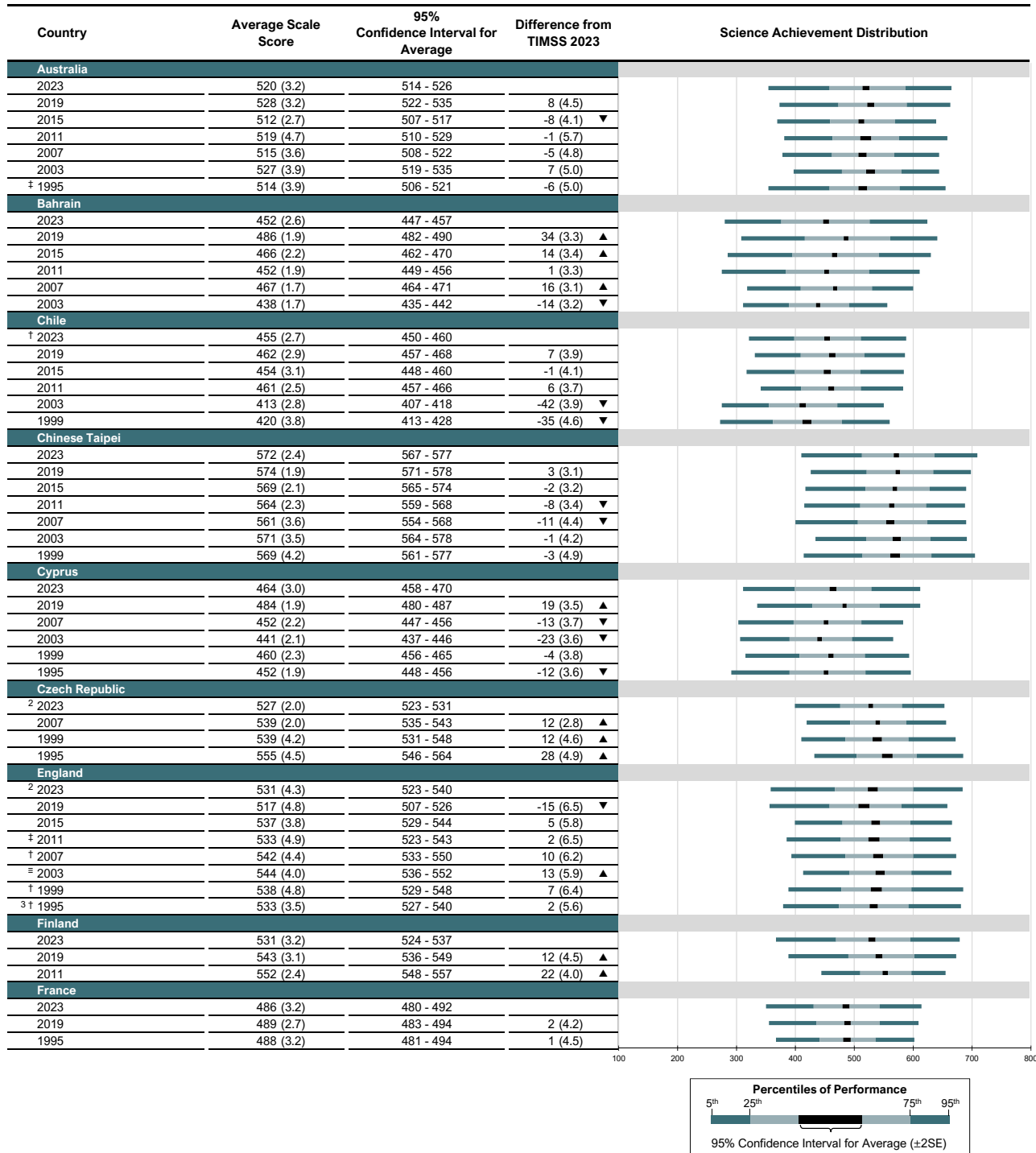
The scale interval is 10 points for each country, but a different part of the scale is shown according to each country's average achievement.

■ The black bars represent the 95% confidence interval.

SOURCE: IEA's Trends in International Mathematics and Science Study - TIMSS 2023
Downloaded from <https://timss2023.org/results>

Exhibit 2.2.10: Trends in Average Science Achievement and Scale Score Distributions

This exhibit reports differences in achievement across assessment years for the countries and benchmarking participants that have comparable data from previous TIMSS assessments. Symbols indicate if the row year is significantly higher (▲) or significantly lower (▼) than the performance in TIMSS 2023. See Appendix A for country participation in previous TIMSS assessments.



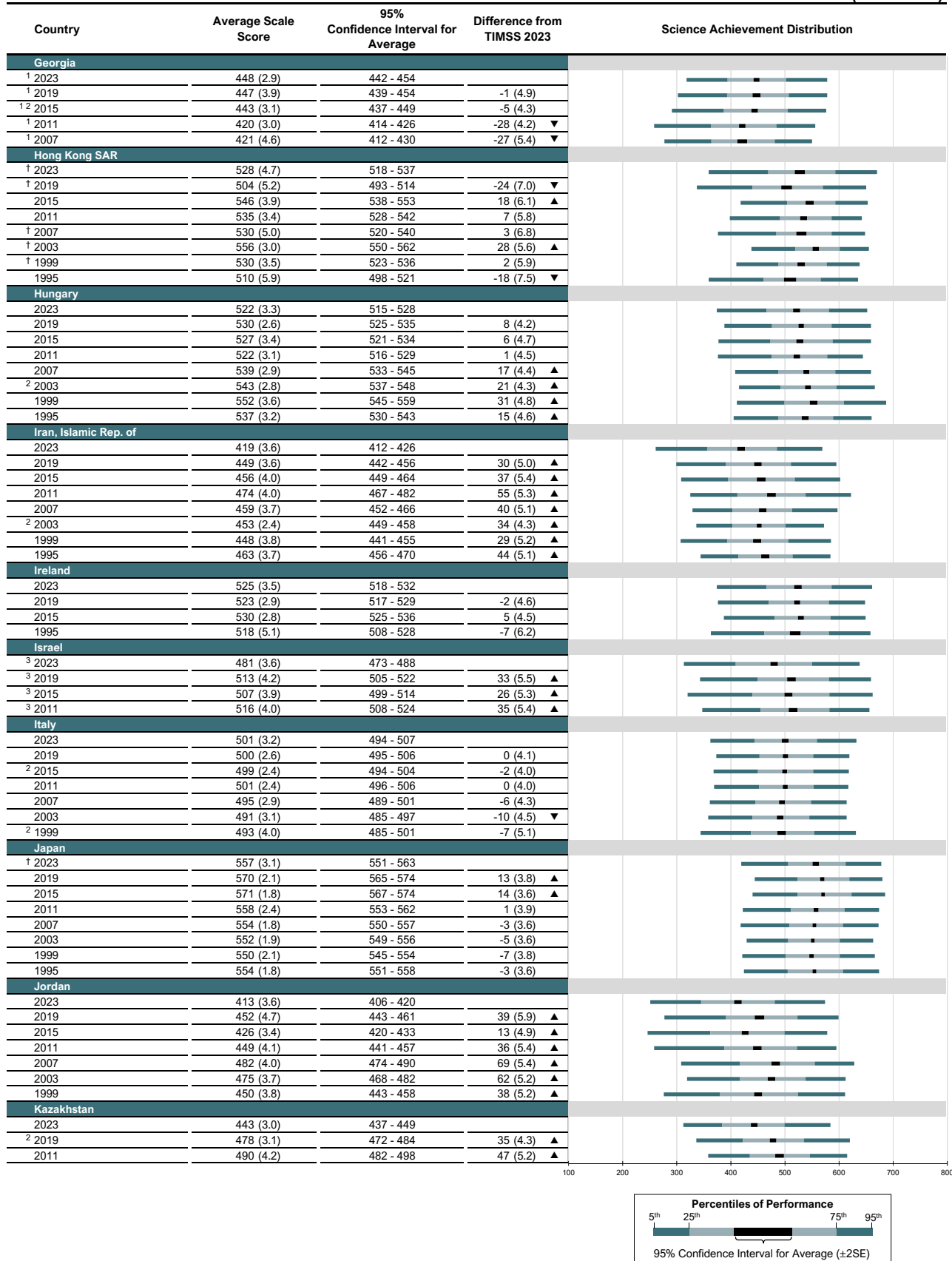
See Appendix A for country participation in previous TIMSS assessments.

() Standard errors appear in parentheses. Because of rounding some results may appear inconsistent.

See Appendix B.7 for population coverage notes 1, 2, and 3. See Appendix B.10 for sampling guidelines and sampling participation notes †, ‡, and =.

Exhibit 2.2.10: Trends in Average Science Achievement and Scale Score Distributions

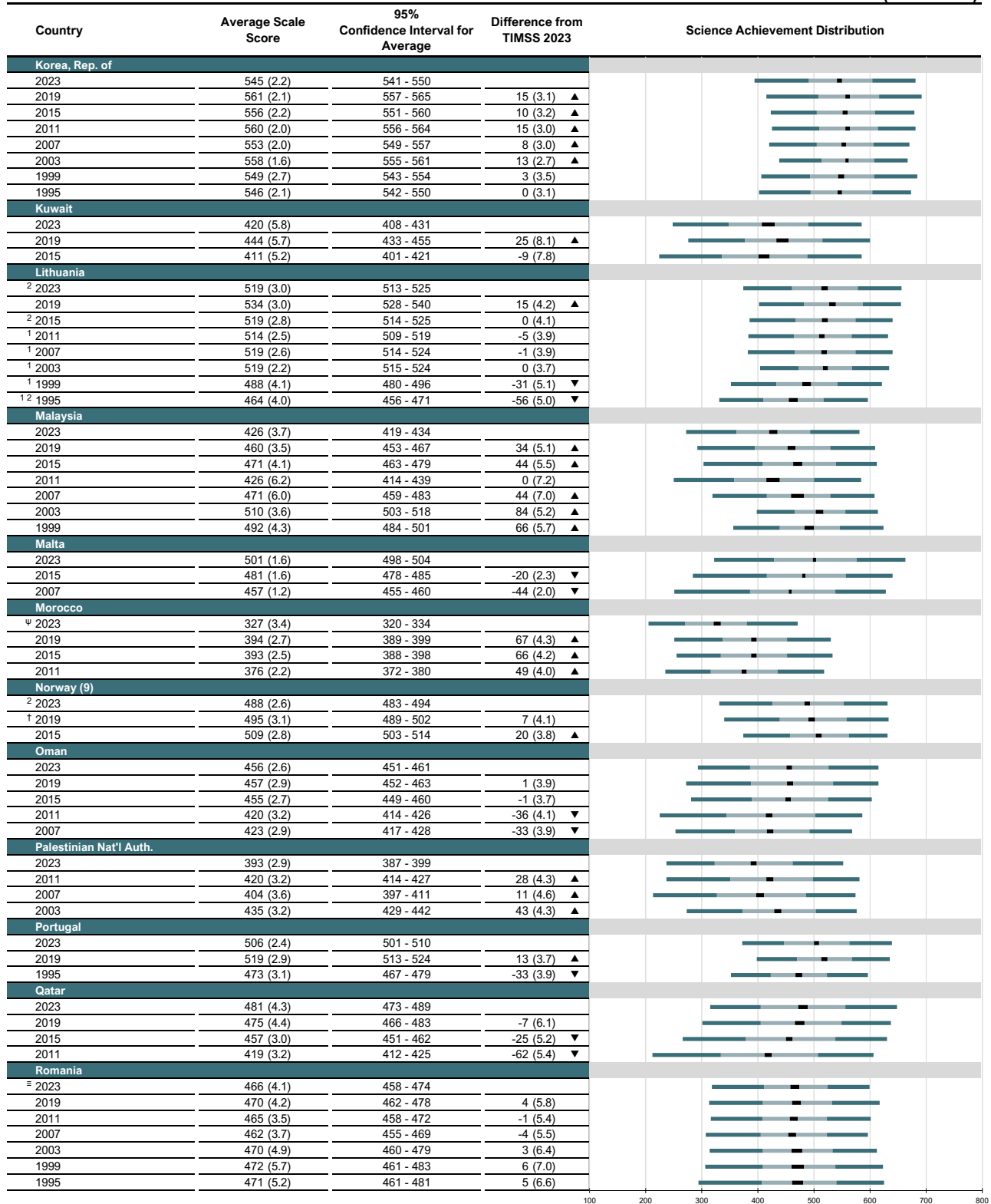
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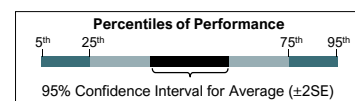
SOURCE: IEA's Trends in International Mathematics and Science Study - TIMSS 2023
 Downloaded from <https://timss2023.org/results>

Exhibit 2.2.10: Trends in Average Science Achievement and Scale Score Distributions

(Continued)



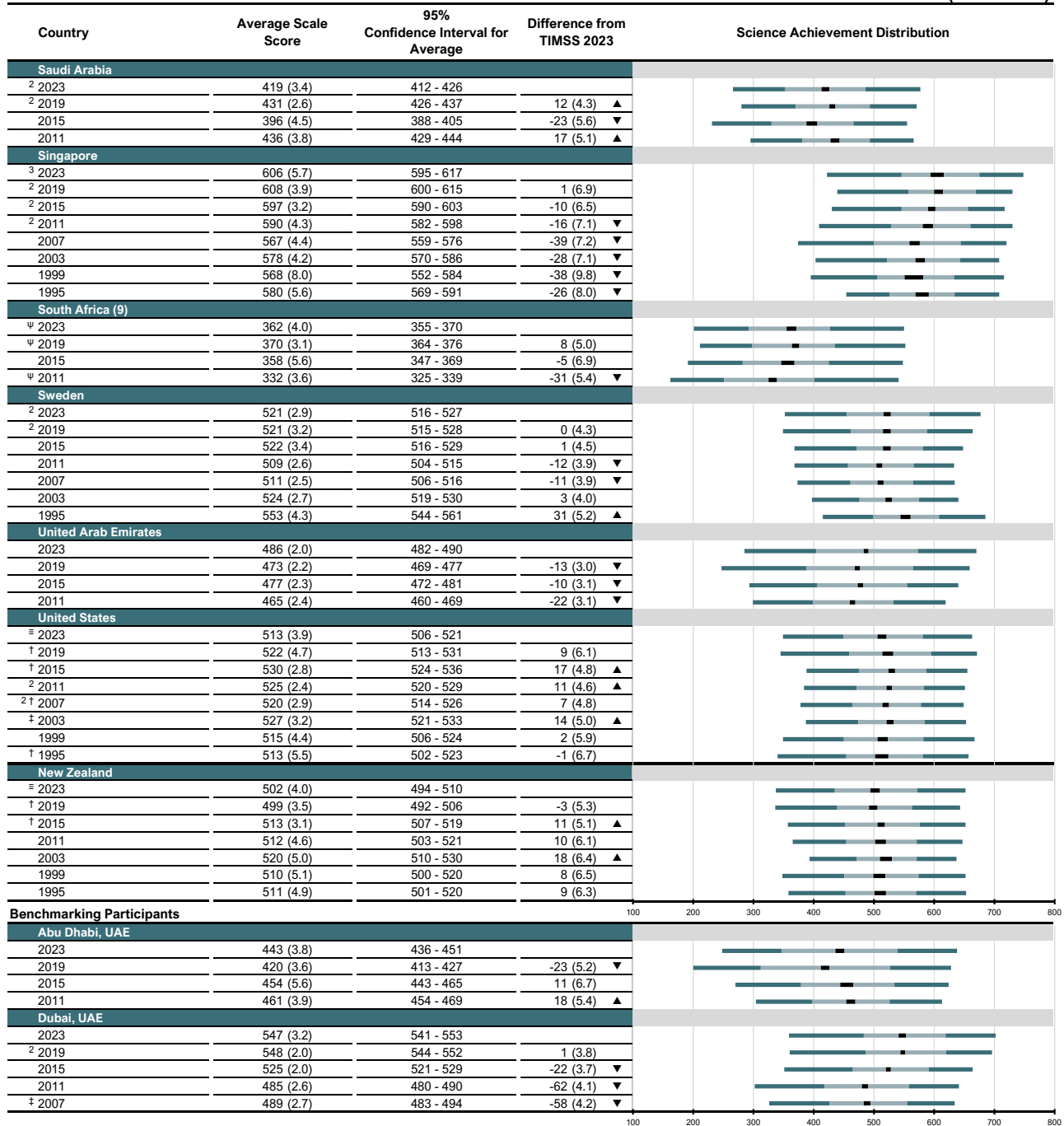
^ψ Reservations about reliability because the percentage of students with achievement too low for estimation exceeds 15% but does not exceed 25%.



SOURCE: IEA's Trends in International Mathematics and Science Study - TIMSS 2023
Downloaded from <https://timss2023.org/results>

Exhibit 2.2.10: Trends in Average Science Achievement and Scale Score Distributions

(Continued)



New Zealand did not satisfy guidelines for minimum school participation rates in 2023.

^ψ Reservations about reliability because the percentage of students with achievement too low for estimation exceeds 15% but does not exceed 25%.SOURCE: IEA's Trends in International Mathematics and Science Study - TIMSS 2023
Downloaded from <https://timss2023.org/results>

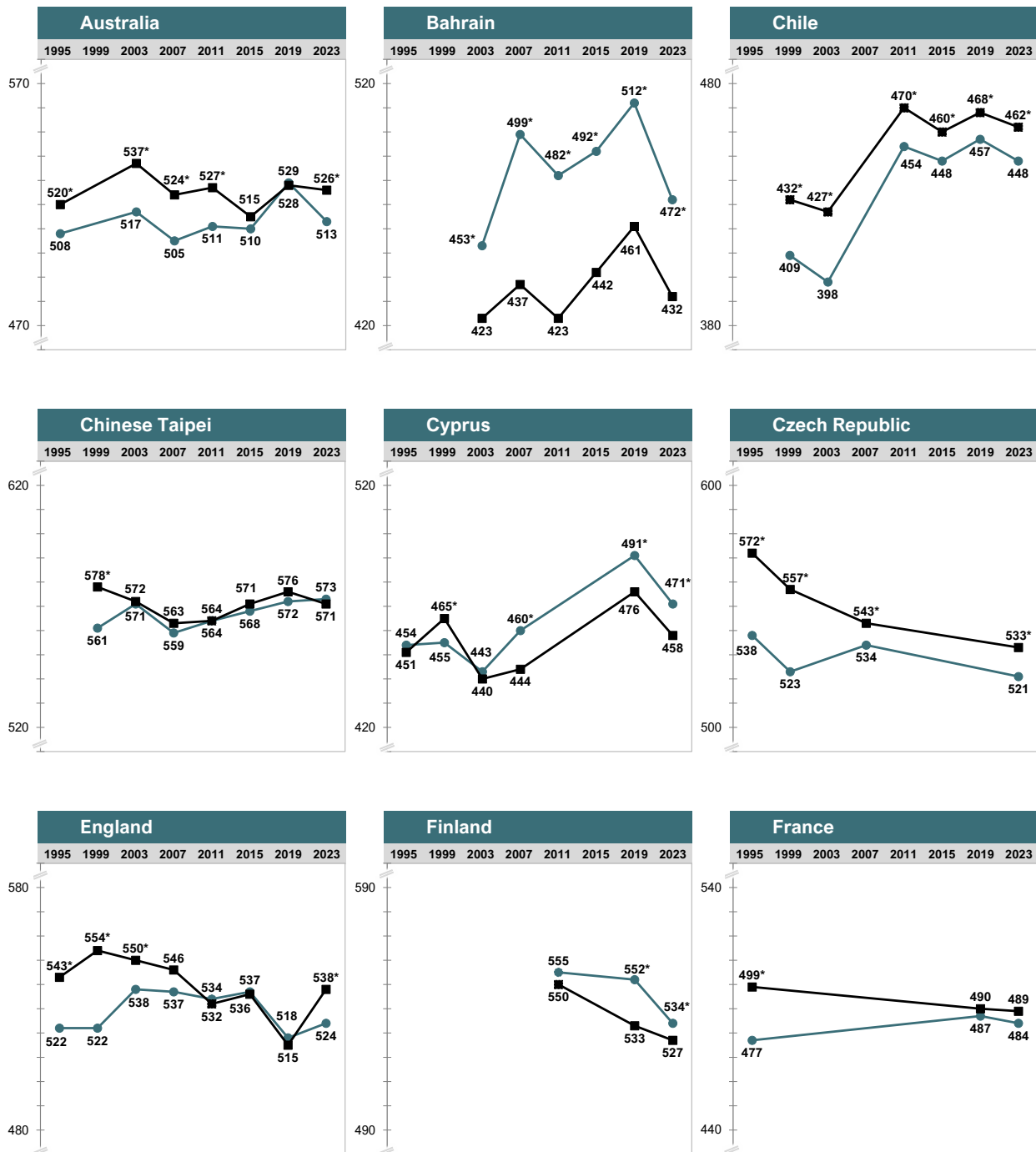
Trend Plots of Average Science Achievement for Girls and Boys (Grade 8)

For the TIMSS 2023 countries with comparable data from previous TIMSS assessments, Exhibit 2.2.11 contains graphs of average science achievement across assessment cycles for girls and boys. In each country graph, the y-axis ranges 120 points with a scale interval of 10 points, but a different part of the scale is shown according to each country's average achievement. Generally, the difference in average science achievement between girls and boys has remained relatively stable across TIMSS assessments. Of the 34 countries with comparable data in 2019 and 2023, 10 had no difference between girls and boys in both assessment cycles. However, four countries with no difference between girls and boys in TIMSS 2019 had a gap favoring boys in TIMSS 2023. In six countries the achievement gap was closed such that the difference between girls and boys was flagged as statistically significant in 2019, but not in 2023.

Exhibit 2.2.11: Trend Plots of Average Science Achievement for Girls and Boys

This exhibit displays changes in achievement across assessment years for girls and boys for the countries and benchmarking participants that have comparable data from previous TIMSS assessments. The scale interval is 10 points for each country, but a different part of the scale is shown according to each country's average achievement. See Appendix A for country participation in previous assessments.

Girls —●— Boys —■— * Average significantly higher than other gender ($p < 0.05$)



See Appendix A for country participation in previous TIMSS assessments.

The scale interval is 10 points for each country, but a different part of the scale is shown according to each country's average achievement.

Students' gender information was obtained from school tracking data.

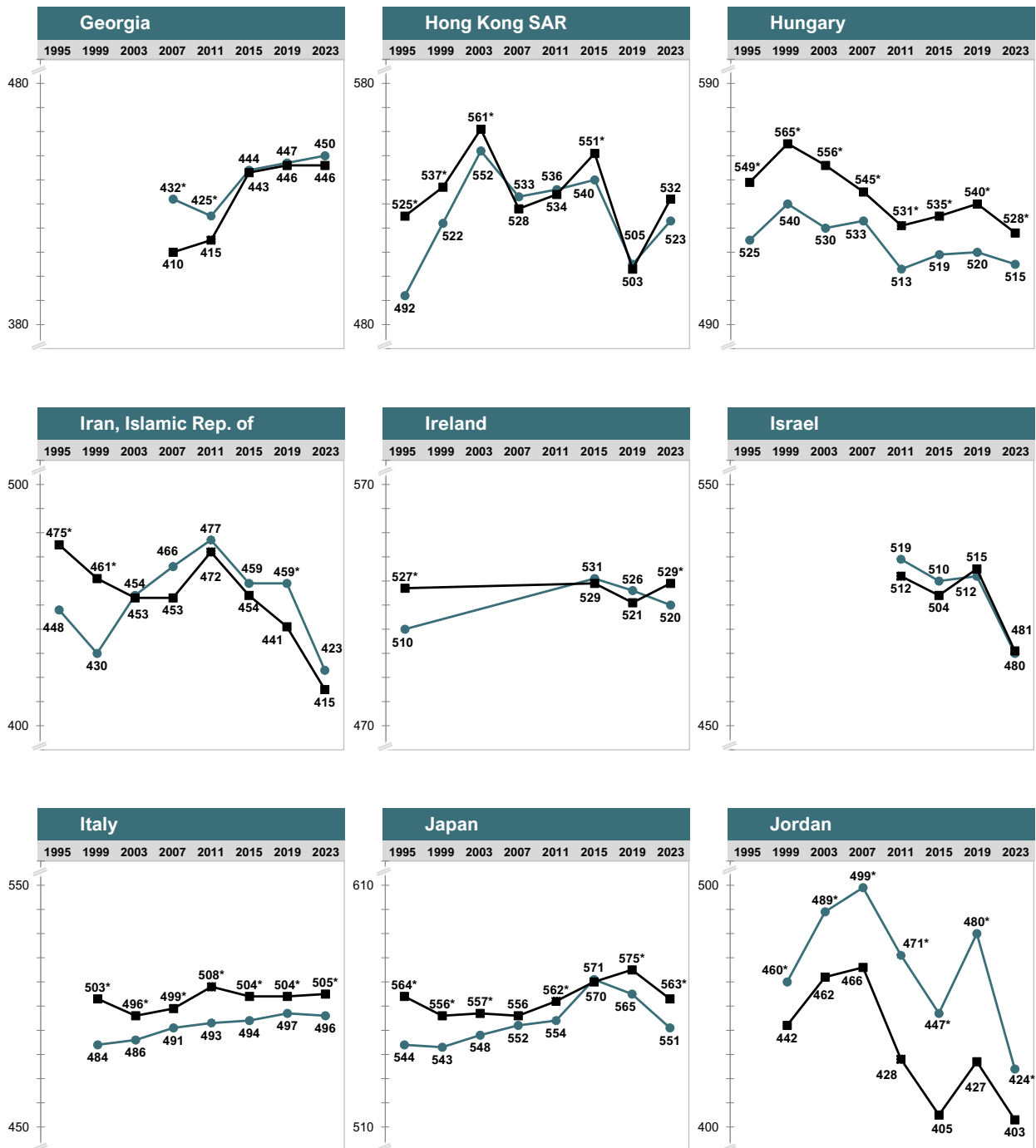
SOURCE: IEA's Trends in International Mathematics and Science Study - TIMSS 2023
Downloaded from <https://timss2023.org/results>

Exhibit 2.2.11: Trend Plots of Average Science Achievement for Girls and Boys

(Continued)

This exhibit displays changes in achievement across assessment years for girls and boys for the countries and benchmarking participants that have comparable data from previous TIMSS assessments. The scale interval is 10 points for each country, but a different part of the scale is shown according to each country's average achievement. See Appendix A for country participation in previous assessments.

Girls ● Boys ■ * Average significantly higher than other gender ($p < 0.05$)



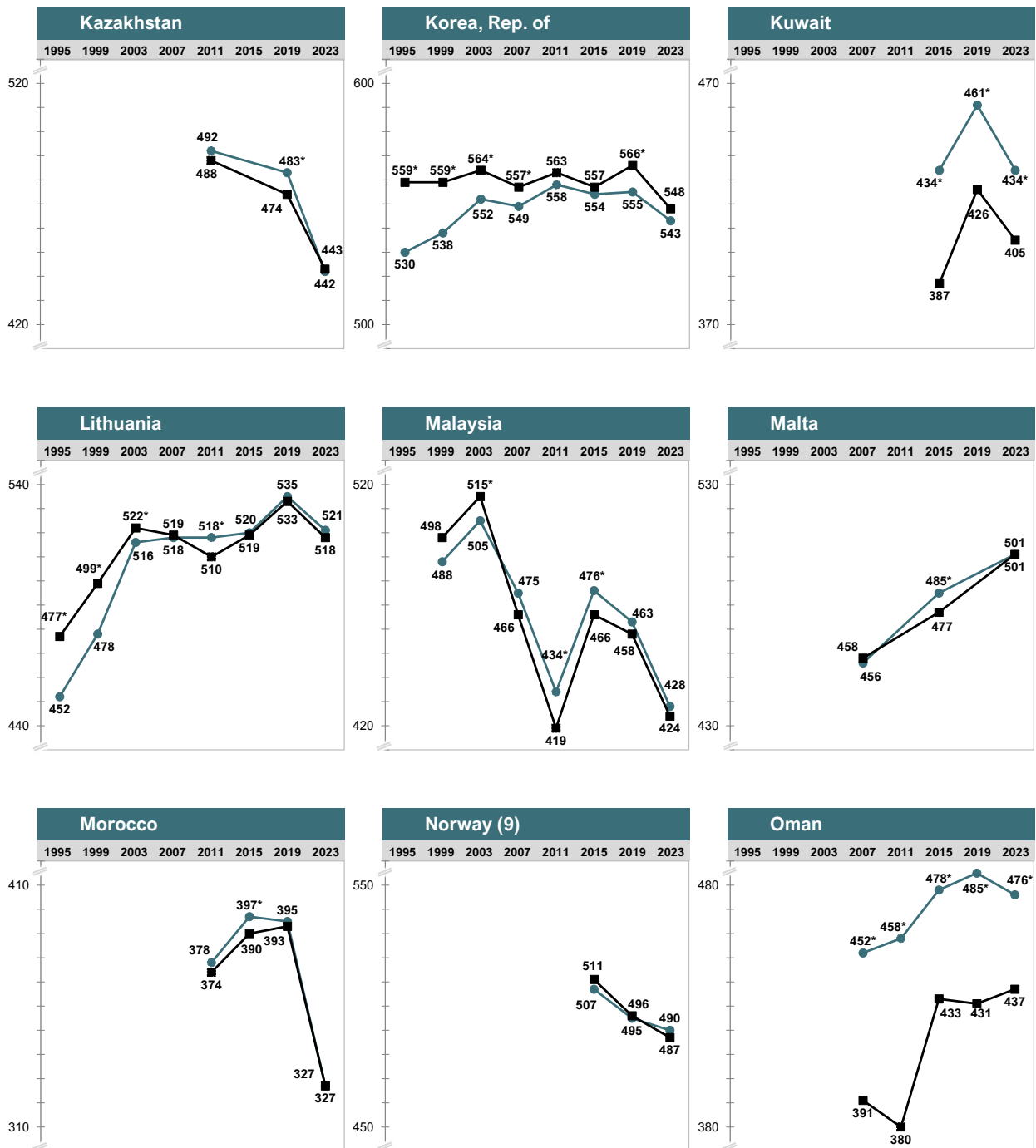
See Appendix A for country participation in previous TIMSS assessments.
The scale interval is 10 points for each country, but a different part of the scale is shown according to each country's average achievement.
Students' gender information was obtained from school tracking data.

Exhibit 2.2.11: Trend Plots of Average Science Achievement for Girls and Boys

(Continued)

This exhibit displays changes in achievement across assessment years for girls and boys for the countries and benchmarking participants that have comparable data from previous TIMSS assessments. The scale interval is 10 points for each country, but a different part of the scale is shown according to each country's average achievement. See Appendix A for country participation in previous assessments.

Girls ● Boys ■ * Average significantly higher than other gender ($p < 0.05$)



See Appendix A for country participation in previous TIMSS assessments.
The scale interval is 10 points for each country, but a different part of the scale is shown according to each country's average achievement.
Students' gender information was obtained from school tracking data.

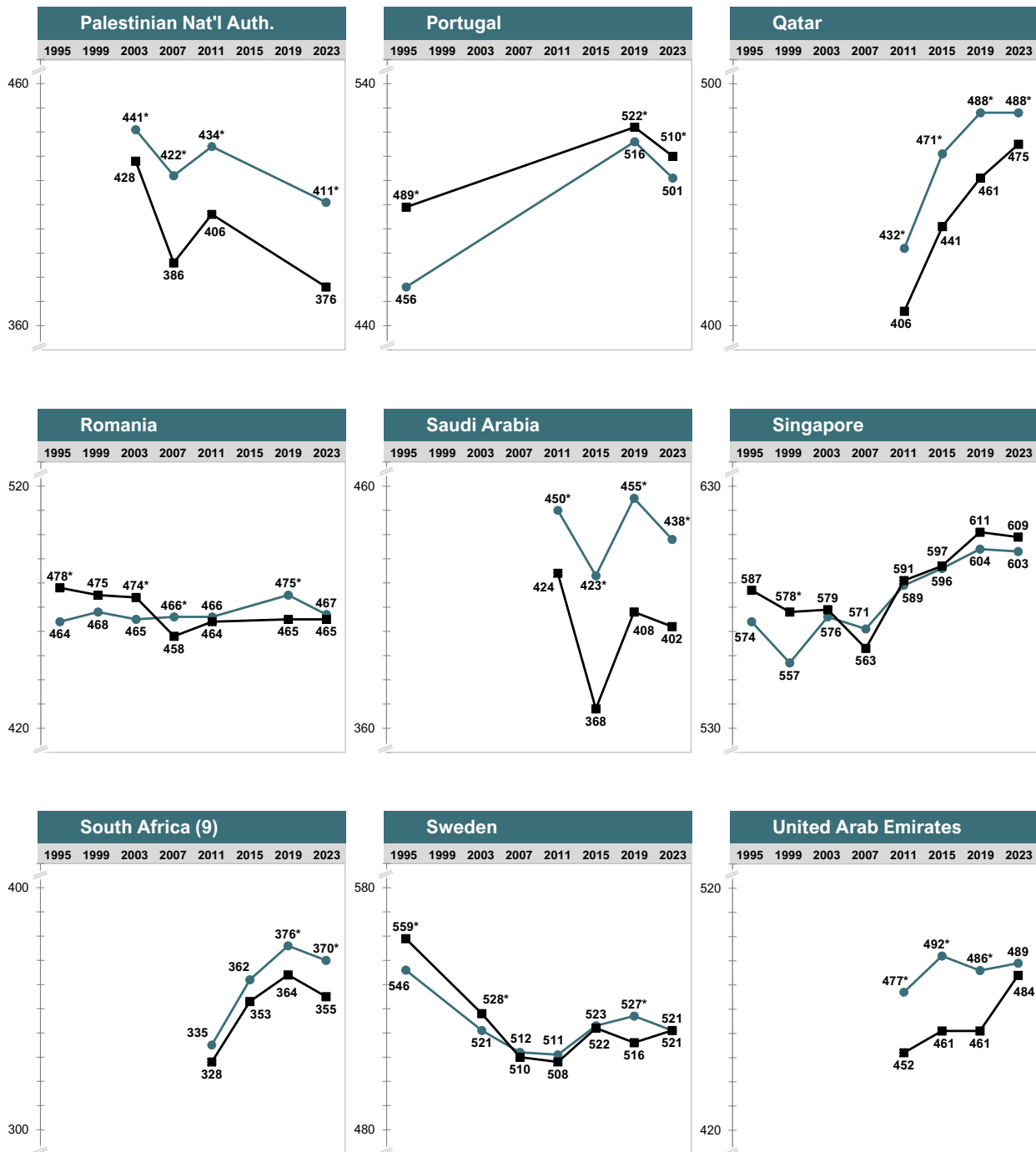
SOURCE: IEA's Trends in International Mathematics and Science Study - TIMSS 2023
Downloaded from <https://timss2023.org/results>

Exhibit 2.2.11: Trend Plots of Average Science Achievement for Girls and Boys

(Continued)

This exhibit displays changes in achievement across assessment years for girls and boys for the countries and benchmarking participants that have comparable data from previous TIMSS assessments. The scale interval is 10 points for each country, but a different part of the scale is shown according to each country's average achievement. See Appendix A for country participation in previous assessments.

Girls —●— Boys —■— * Average significantly higher than other gender ($p < 0.05$)



See Appendix A for country participation in previous TIMSS assessments.

The scale interval is 10 points for each country, but a different part of the scale is shown according to each country's average achievement. Students' gender information was obtained from school tracking data.

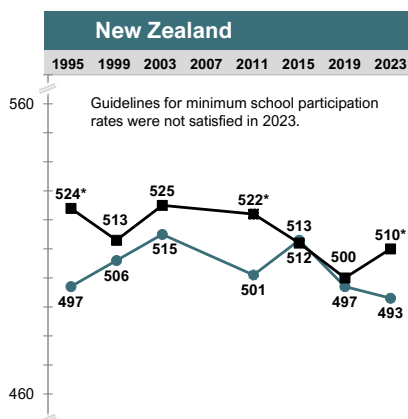
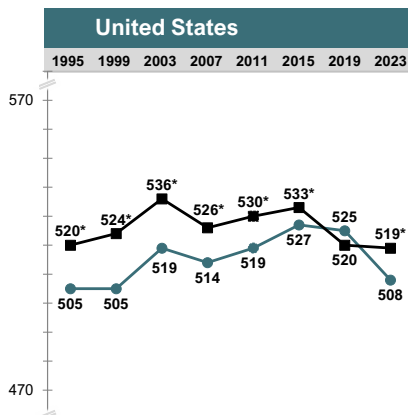
SOURCE: IEA's Trends in International Mathematics and Science Study - TIMSS 2023
Downloaded from <https://timss2023.org/results>

Exhibit 2.2.11: Trend Plots of Average Science Achievement for Girls and Boys

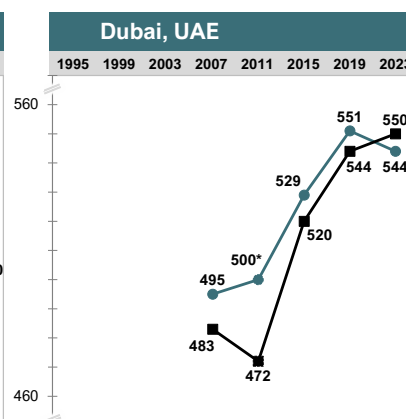
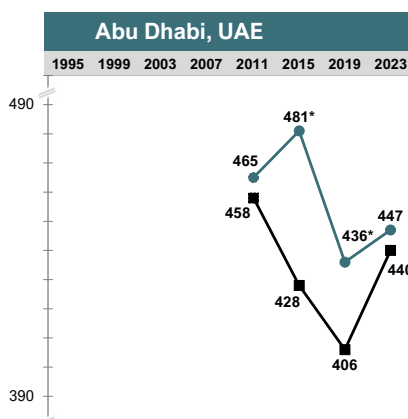
(Continued)

This exhibit displays changes in achievement across assessment years for girls and boys for the countries and benchmarking participants that have comparable data from previous TIMSS assessments. The scale interval is 10 points for each country, but a different part of the scale is shown according to each country's average achievement. See Appendix A for country participation in previous assessments.

Girls ● Boys ■ * Average significantly higher than other gender ($p < 0.05$)



Benchmarking Participants



See Appendix A for country participation in previous TIMSS assessments.

The scale interval is 10 points for each country, but a different part of the scale is shown according to each country's average achievement. Students' gender information was obtained from school tracking data.

SOURCE: IEA's Trends in International Mathematics and Science Study - TIMSS 2023
Downloaded from <https://timss2023.org/results>

Trends in Distributions of Students Reaching the TIMSS International Benchmarks of Science Achievement (Grade 8)

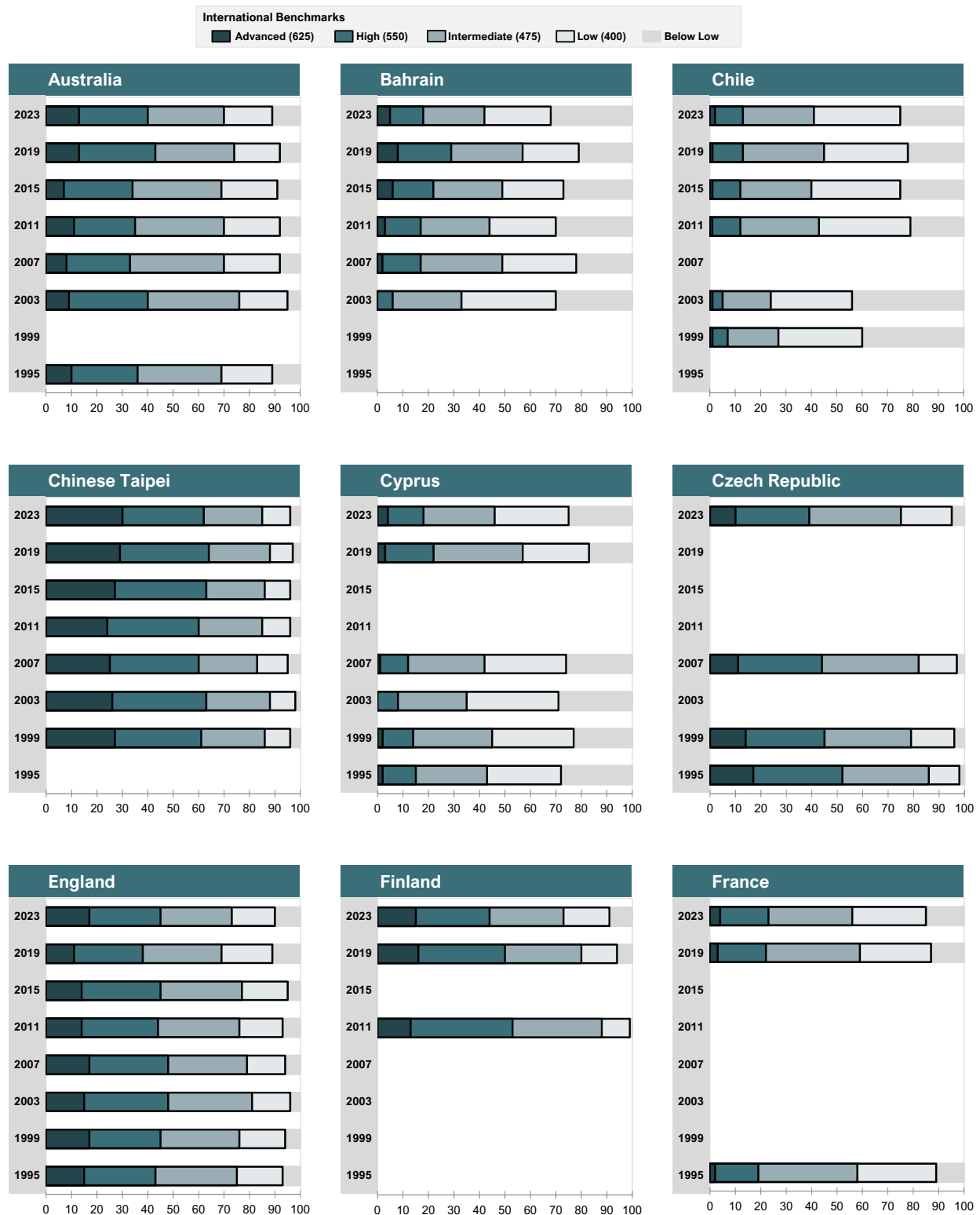
Exhibit 2.2.12 provides bar graphs for each country and benchmarking participant with comparable data from previous TIMSS assessments, presenting the distribution of students at the TIMSS International Benchmarks with a bar for each cycle from 1995 to 2023. Each bar displays the percentage of students reaching each of the International Benchmarks for a given assessment cycle. The shading of the bar segments ranges from dark to light green, and each lighter colored segment indicates the cumulative percentage of students that reached the less demanding benchmarks. Few students in most countries reach the Advanced Benchmark (darkest green segment); more students reach the High Benchmark (dark green plus medium green segments); even more students reach the Intermediate Benchmark (indicated by three darker segments); finally, in most countries, a large majority of students reaches the Low Benchmark (all shades of green combined). The gray area indicates the percentage of students that did not reach the Low International Benchmark (i.e., were “below low”). The achievement of these students cannot be characterized by any of the TIMSS 2023 International Benchmarks.

Students reaching the Intermediate, High, and Advanced International Benchmarks demonstrated all the science skills at their level but also those displayed by the students at the lower levels. Long-term increases in the percentages of students reaching the Low and Intermediate Benchmarks provide an indication that more students over time demonstrate a basic level of science proficiency.

The short-term trends between TIMSS 2019 and TIMSS 2023 show more decreases than increases in percentages of students reaching the International Benchmarks, especially at the lower end of the scale. Of the 34 countries that participated in both 2019 and 2023 with comparable data, 5 increased and 7 decreased at the Advanced International Benchmark, 2 increased and 14 decreased at the High Benchmark, 1 increased and 19 decreased at the Intermediate Benchmark, and 2 increased and 19 decreased at the Low Benchmark.

Exhibit 2.2.12: Trends in Distributions of Students Reaching the TIMSS International Benchmarks of Science Achievement

This exhibit displays changes in percentages of students reaching the TIMSS International Benchmarks across assessment cycles for the countries and benchmarking participants that have comparable data from previous assessments. See Appendix A for country participation in previous assessments.



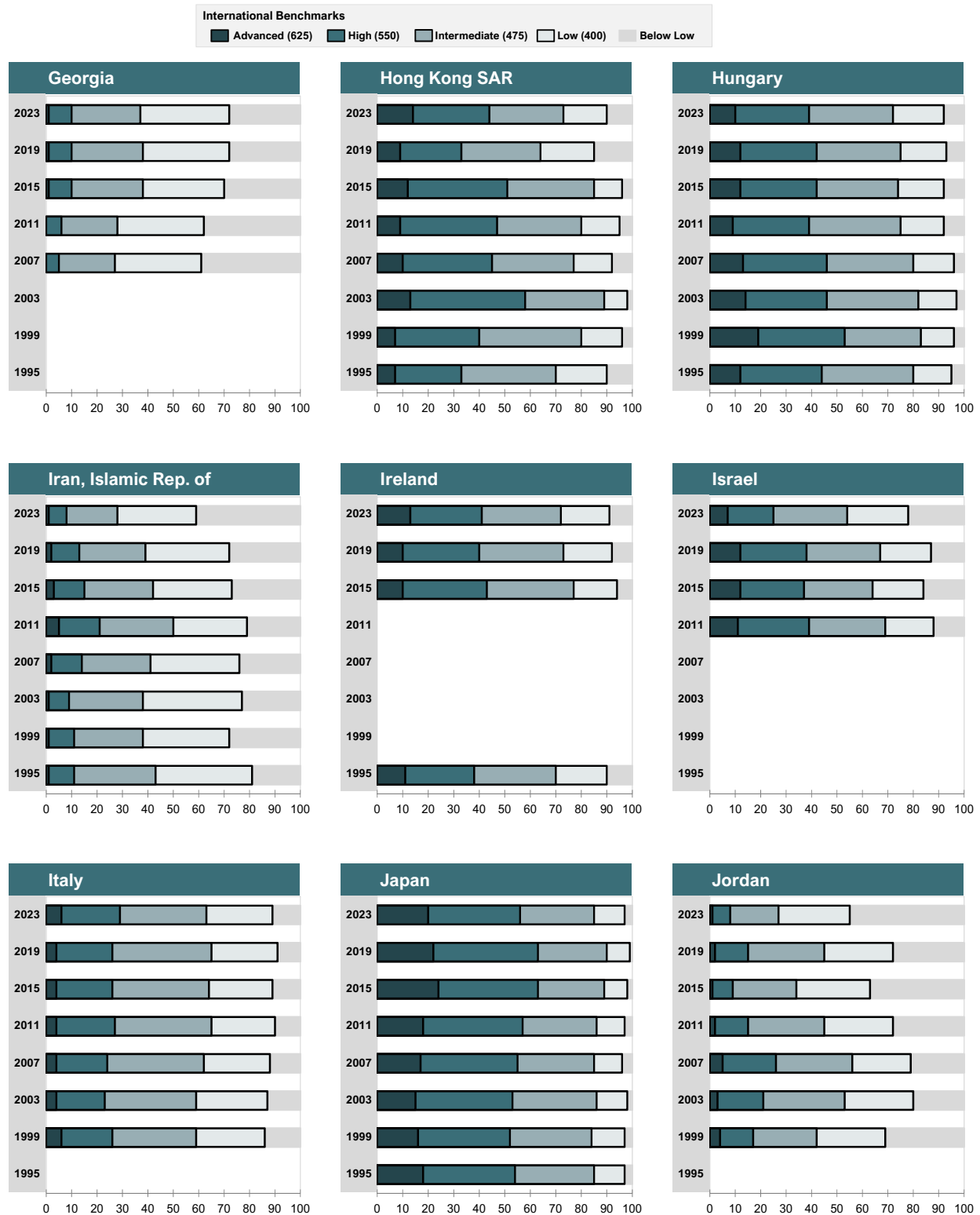
See Appendix A for country participation in previous TIMSS assessments.

SOURCE: IEA's Trends in International Mathematics and Science Study - TIMSS 2023
Downloaded from <https://timss2023.org/results>

Exhibit 2.2.12: Trends in Distributions of Students Reaching the TIMSS International Benchmarks of Science Achievement

(Continued)

This exhibit displays changes in percentages of students reaching the TIMSS International Benchmarks across assessment cycles for the countries and benchmarking participants that have comparable data from previous assessments. See Appendix A for country participation in previous assessments.



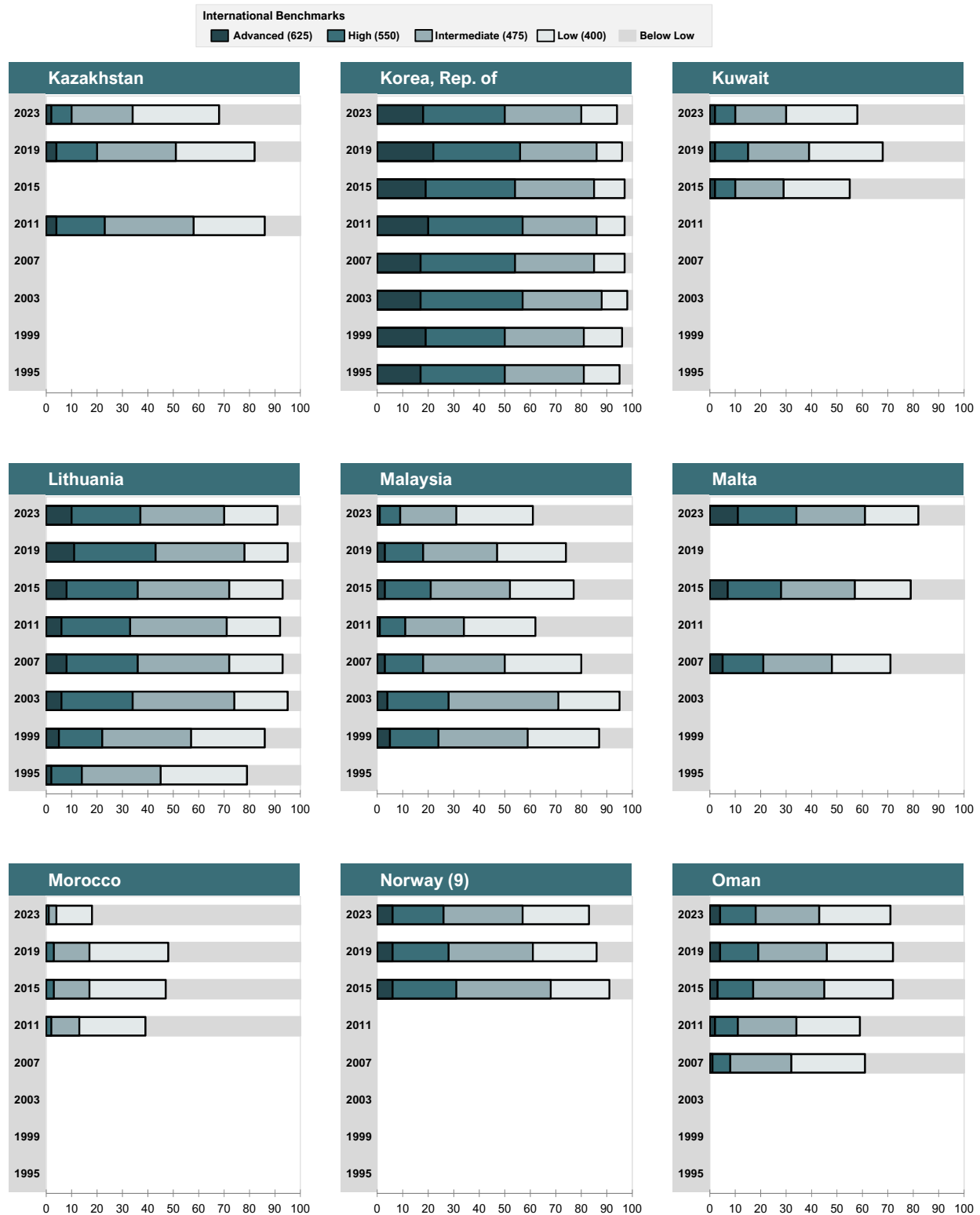
See Appendix A for country participation in previous TIMSS assessments.

SOURCE: IEA's Trends in International Mathematics and Science Study - TIMSS 2023
Downloaded from <https://timss2023.org/results>

Exhibit 2.2.12: Trends in Distributions of Students Reaching the TIMSS International Benchmarks of Science Achievement

(Continued)

This exhibit displays changes in percentages of students reaching the TIMSS International Benchmarks across assessment cycles for the countries and benchmarking participants that have comparable data from previous assessments. See Appendix A for country participation in previous assessments.



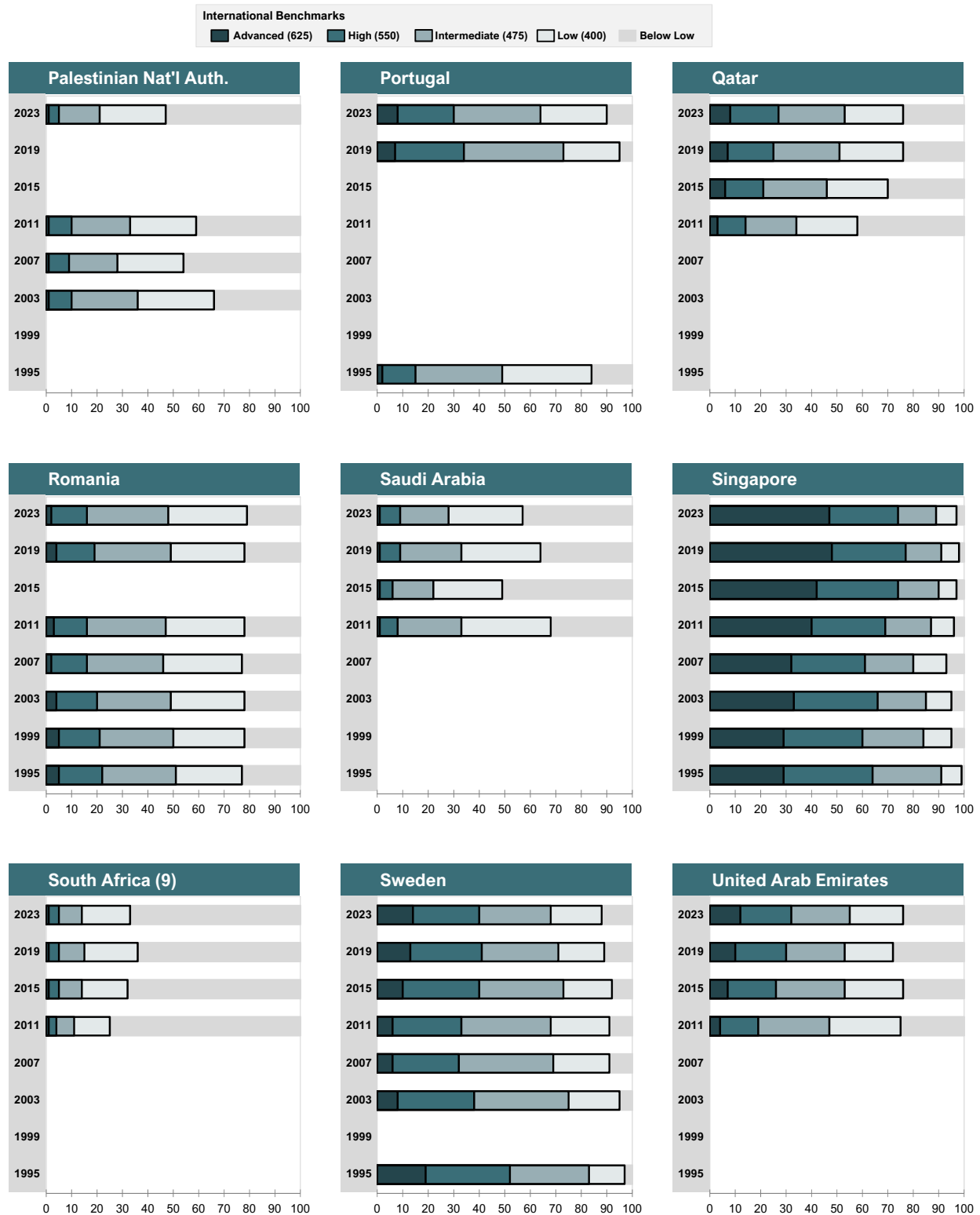
See Appendix A for country participation in previous TIMSS assessments.

SOURCE: IEA's Trends in International Mathematics and Science Study - TIMSS 2023
Downloaded from <https://timss2023.org/results>

Exhibit 2.2.12: Trends in Distributions of Students Reaching the TIMSS International Benchmarks of Science Achievement

(Continued)

This exhibit displays changes in percentages of students reaching the TIMSS International Benchmarks across assessment cycles for the countries and benchmarking participants that have comparable data from previous assessments. See Appendix A for country participation in previous assessments.



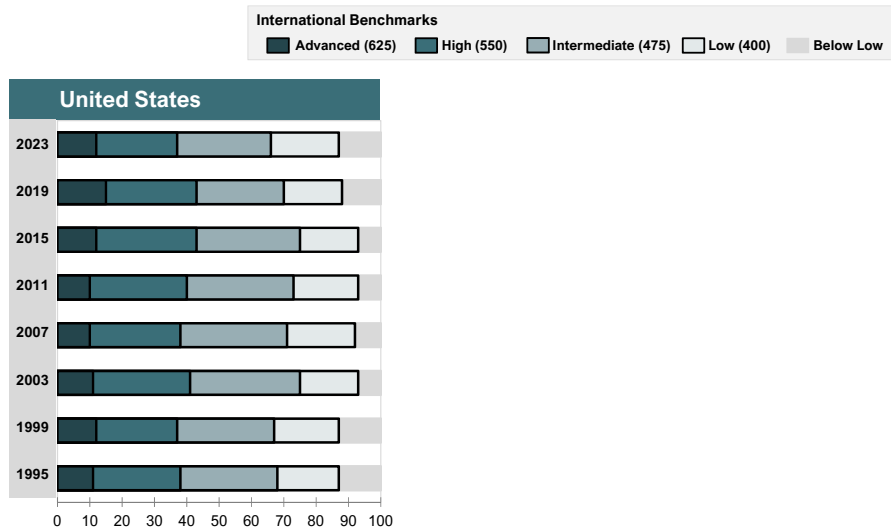
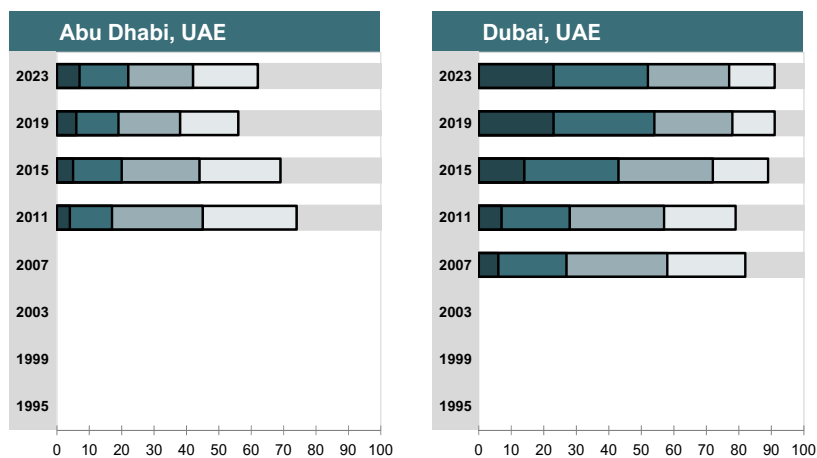
See Appendix A for country participation in previous TIMSS assessments.

SOURCE: IEA's Trends in International Mathematics and Science Study - TIMSS 2023
Downloaded from <https://timss2023.org/results>

Exhibit 2.2.12: Trends in Distributions of Students Reaching the TIMSS International Benchmarks of Science Achievement

(Continued)

This exhibit displays changes in percentages of students reaching the TIMSS International Benchmarks across assessment cycles for the countries and benchmarking participants that have comparable data from previous assessments. See Appendix A for country participation in previous assessments.

**Benchmarking Participants**

See Appendix A for country participation in previous TIMSS assessments.

SOURCE: IEA's Trends in International Mathematics and Science Study - TIMSS 2023
Downloaded from <https://timss2023.org/results>

Grade 8 Relative Achievement in Science Content and Cognitive Domains

Introduction to Science Content and Cognitive Domains (Grade 8)

The [TIMSS 2023 Science Framework](#) specifies four content domains in science at the eighth grade: biology, chemistry, physics, and earth science. The proportion of items in the assessment belonging to these four domains is determined by the number of topics within each domain. These framework specifications informed assessment composition and item development.

Biology Content Domain

Thirty-five percent of the eighth-grade science assessment was devoted to biology, including characteristics and life processes of organisms; cells and their functions; life cycles, reproduction, and heredity; diversity, adaptation, and natural selection; ecosystems; and human health. Eighth-grade students were asked about how structure relates to function in organisms, cell structure and function, and the processes of photosynthesis and cellular respiration. Other areas assessed included reproduction and heredity, molecular biology and molecular genetics, adaptation and natural selection, and processes and interactions in ecosystems.

Chemistry Content Domain

Twenty percent of the assessment covered three chemistry topics—composition of matter, properties of matter, and chemical change. Students were asked about elements, compounds, and mixtures; the use of the periodic table; physical and chemical properties of matter; as well as the properties of mixtures and solutions and the properties of acids and bases. The chemical change topic focused on the characteristics of chemical changes and the conservation of matter during chemical changes.

Physics Content Domain

Twenty-five percent of the assessment was devoted to physics, which consisted of five topics: physical states and changes in matter, energy transformation and transfer, light and sound, electricity and magnetism, and motion and forces. For example, eighth-grade students were asked to describe processes involved in changes in the state of matter, to identify different forms of energy and describe simple energy transformations, to apply the principle of conservation of total energy in practical situations, to understand the difference between thermal energy (heat) and temperature, to describe properties of permanent magnets, and to know how simple machines function.

Earth Science Content Domain

The remaining 20 percent of the assessment was devoted to earth science topics. Students were asked about the structure and physical features of Earth, including Earth's structural layers and the atmosphere, as well as processes, cycles, and patterns, including geological processes that have occurred over Earth's history, the water cycle, and patterns of weather and climate. Earth's resources and their use and conservation also were covered. Students were also asked about Earth in the Solar System and the universe, including identifying how observable phenomena relate to the movements of Earth and the Moon, and describing the features of Earth, the Moon, and other planets.

Knowing, Applying, and Reasoning Cognitive Domains

Eighth-grade students also needed to draw on a range of cognitive skills across the content domains described above. There are three cognitive domains: knowing, applying, and reasoning. Thirty-five percent of the eighth-grade assessment was devoted to the knowing cognitive domain, 35 percent to applying, and 30 percent to reasoning. The knowing domain covers recognizing, describing, and providing examples of facts, concepts, and procedures students were expected to know at eighth grade. The applying domain focuses on students' ability to apply knowledge and conceptual understanding through comparing, explaining, relating, and interpreting models and information to solve practical problems or answer questions. The reasoning domain goes beyond the solution of familiar problems to encompass unfamiliar situations, complex contexts, and multistep problems. Additionally, five science practices fundamental to scientific inquiry were assessed within the content areas and cognitive domains.

The results in the content and cognitive subscales are presented to provide a more nuanced view of overall science achievement. The comparison between overall science achievement and particular subscales may indicate countries' relative strengths and weaknesses within overall science. However, the subscales are based on only a subset of the assessment items, making them somewhat less robust than the overall science achievement results based on the entire set of items.

For information about how the subscales for the content and cognitive domains were created, see Chapter 12 in the [TIMSS 2023 Technical Report](#).

Relative Achievement in Science Content Domains (Grade 8)

Exhibit 2.2.13 shows countries' average achievement in each of the four content science domains relative to their overall average achievement (presented from highest to lowest overall average achievement as the default sort). The exhibit also highlights differences based on a test of statistical significance between the average domain score and the overall science score using an alpha level of 0.01. A smaller alpha level was used to flag statistical significance of subdomain differences to reduce the number of false positives that can be expected due to multiple comparisons across multiple countries and dependent sub-scores. Differences are computed for each student and averaged across the country, rather than comparing different groups of students as in previous exhibits in this section. This within-student dependency leads to considerably smaller standard errors (given in parentheses and reported together with the estimates in the exhibit).

Of the 42 participating countries for which science content domain scores were estimated with internationally comparable data, 10 had a relative strength in biology and 15 had a relative weakness; 13 had a relative strength in chemistry and 10 had a relative weakness; 14 had a relative strength in physics and 12 had a relative weakness; and 13 had a relative strength in earth science and 15 had a relative weakness.

Exhibit 2.2.13: Relative Achievement in Science Content Domains

Country	Overall Science Average Scale Score	Biology (76 Items)		Chemistry (43 Items)		Physics (48 Items)		Earth Science (45 Items)	
		Average Scale Score	Difference from Overall Score	Average Scale Score	Difference from Overall Score	Average Scale Score	Difference from Overall Score	Average Scale Score	Difference from Overall Score
³ Singapore	606 (5.7)	622 (6.1)	16 (1.7) ▲	618 (6.5)	11 (2.1) ▲	614 (6.4)	8 (1.9) ▲	572 (5.2)	-34 (1.7) ▼
Chinese Taipei	572 (2.4)	558 (2.3)	-14 (1.7) ▼	593 (3.0)	21 (1.1) ▲	565 (2.7)	-6 (1.1) ▼	581 (2.7)	9 (1.2) ▲
[†] Japan	557 (3.1)	549 (3.1)	-8 (2.5) ▼	555 (4.2)	-2 (2.4)	563 (3.3)	6 (1.0) ▲	566 (3.5)	9 (1.8) ▲
Korea, Rep. of	545 (2.2)	547 (2.5)	1 (1.5)	522 (2.4)	-23 (1.4) ▼	557 (2.9)	12 (1.4) ▲	555 (2.7)	10 (1.5) ▲
² England	531 (4.3)	531 (4.2)	-1 (1.6)	533 (4.7)	2 (3.0)	532 (4.6)	1 (1.2)	531 (4.7)	0 (2.3)
Finland	531 (3.2)	524 (3.0)	-7 (2.5) ▼	529 (3.3)	-1 (2.3)	536 (3.4)	5 (1.7) ▲	537 (3.5)	6 (1.8) ▲
^{3†} Türkiye	530 (3.6)	517 (3.7)	-12 (2.2) ▼	550 (4.7)	20 (2.3) ▲	534 (3.9)	4 (1.7) ▲	525 (3.8)	-4 (1.1) ▼
[†] Hong Kong SAR	528 (4.7)	527 (5.2)	-1 (1.8)	523 (5.3)	-5 (2.0)	529 (5.1)	1 (2.3)	532 (5.2)	5 (2.4)
² Czech Republic	527 (2.0)	526 (2.2)	-1 (1.1)	517 (3.3)	-10 (3.0) ▼	533 (3.1)	6 (2.3)	530 (2.3)	3 (1.1) ▲
Ireland	525 (3.5)	519 (4.1)	-6 (1.6) ▼	528 (3.6)	3 (1.8)	521 (3.7)	-4 (1.9)	536 (3.7)	11 (1.1) ▲
Hungary	522 (3.3)	521 (3.6)	0 (2.1)	513 (3.8)	-9 (1.5) ▼	524 (3.5)	2 (1.7)	525 (3.8)	4 (2.6)
² Sweden	521 (2.9)	519 (3.3)	-2 (2.1)	520 (3.6)	-1 (2.0)	520 (2.9)	-1 (1.5)	526 (3.3)	5 (1.6) ▲
Australia	520 (3.2)	513 (3.1)	-7 (1.1) ▼	515 (3.2)	-5 (1.1) ▼	530 (3.6)	10 (1.9) ▲	527 (3.7)	7 (2.0) ▲
² Lithuania	519 (3.0)	519 (3.2)	0 (0.8)	524 (3.7)	4 (2.0)	516 (3.2)	-3 (1.5)	517 (3.2)	-3 (1.6)
[‡] United States	513 (3.9)	516 (3.9)	3 (1.0) ▲	505 (4.1)	-9 (1.5) ▼	517 (4.2)	3 (1.5)	511 (4.3)	-3 (1.1)
² Austria	512 (2.4)	504 (3.0)	-8 (1.7) ▼	507 (3.0)	-4 (1.7)	523 (2.8)	11 (1.6) ▲	521 (3.5)	10 (2.4) ▲
Portugal	506 (2.4)	511 (2.6)	6 (1.4) ▲	502 (2.8)	-4 (1.3) ▼	495 (2.2)	-11 (1.2) ▼	507 (3.2)	2 (2.3)
Malta	501 (1.6)	493 (1.7)	-9 (0.9) ▼	508 (1.8)	7 (0.9) ▲	505 (1.6)	4 (1.3) ▲	506 (1.8)	4 (1.1) ▲
Italy	501 (3.2)	505 (3.6)	5 (1.2) ▲	490 (3.3)	-11 (1.2) ▼	486 (3.6)	-15 (1.6) ▼	513 (4.1)	12 (2.3) ▲
² Norway (9)	488 (2.6)	483 (2.9)	-5 (1.3) ▼	478 (3.4)	-10 (1.8) ▼	492 (2.8)	4 (1.2) ▲	503 (2.6)	15 (1.2) ▲
United Arab Emirates	486 (2.0)	488 (2.3)	1 (0.7)	498 (2.4)	11 (1.0) ▲	483 (2.1)	-3 (0.6) ▼	475 (2.4)	-11 (1.0) ▼
France	486 (3.2)	477 (3.3)	-9 (1.5) ▼	481 (3.4)	-5 (3.2)	496 (3.3)	9 (1.2)	493 (3.3)	7 (1.7) ▲
Qatar	481 (4.3)	484 (4.3)	3 (1.6)	481 (5.0)	-1 (1.9)	478 (4.4)	-3 (1.1)	473 (4.7)	-8 (2.1) ▼
³ Israel	481 (3.6)	477 (3.9)	-3 (2.1)	489 (4.3)	8 (2.0) ▲	489 (3.9)	8 (1.5) ▲	465 (4.3)	-15 (2.1) ▼
[‡] Romania	466 (4.1)	475 (4.3)	9 (2.3) ▲	465 (4.1)	-1 (2.1)	457 (4.6)	-9 (2.6) ▼	460 (4.4)	-6 (2.5)
Cyprus	464 (3.0)	468 (3.2)	4 (2.3)	464 (3.7)	0 (2.3)	457 (3.3)	-8 (2.4) ▼	463 (4.5)	-1 (2.5)
Oman	456 (2.6)	464 (2.3)	8 (1.6) ▲	455 (2.7)	-1 (1.3)	455 (2.3)	-1 (1.2)	435 (2.6)	-21 (0.9) ▼
[†] Chile	455 (2.7)	463 (3.4)	8 (2.2) ▲	446 (2.8)	-9 (1.6) ▼	445 (2.9)	-10 (1.6) ▼	455 (2.6)	0 (1.7)
Bahrain	452 (2.6)	453 (2.5)	1 (1.4)	457 (2.9)	5 (1.6) ▲	450 (2.3)	-2 (1.9)	436 (3.0)	-16 (2.6) ▼
¹ Georgia	448 (2.9)	459 (3.3)	11 (3.3) ▲	448 (3.3)	0 (1.6)	440 (3.2)	-8 (2.7) ▼	427 (3.2)	-21 (2.3) ▼
Kazakhstan	443 (3.0)	439 (3.4)	-4 (0.9) ▼	453 (3.0)	10 (1.0) ▲	448 (2.7)	6 (1.1) ▲	426 (3.2)	-16 (1.4) ▼
Malaysia	426 (3.7)	425 (4.0)	-1 (0.9)	428 (3.7)	1 (0.9)	426 (3.5)	0 (1.4)	421 (3.8)	-5 (0.8) ▼
Brazil	420 (2.5)	428 (2.9)	8 (1.1) ▲	414 (2.4)	-5 (0.7) ▼	405 (2.9)	-15 (1.4) ▼	421 (3.0)	1 (1.3)
Kuwait	420 (5.8)	414 (5.7)	-6 (2.5)	417 (6.5)	-3 (2.7)	423 (5.4)	3 (2.5)	420 (5.8)	0 (2.8)
² Saudi Arabia	419 (3.4)	416 (3.8)	-3 (0.9) ▼	423 (3.4)	4 (1.3) ▲	415 (3.2)	-4 (1.8)	419 (3.0)	0 (1.9)
Iran, Islamic Rep. of	419 (3.6)	421 (3.4)	2 (1.5)	418 (3.9)	-1 (1.8)	408 (3.2)	-11 (1.6) ▼	411 (4.2)	-8 (2.7) ▼
Jordan	413 (3.6)	411 (3.4)	-2 (1.5)	414 (4.1)	1 (1.5)	415 (3.1)	2 (1.5)	406 (3.4)	-7 (2.1) ▼
Azerbaijan	411 (3.0)	419 (2.8)	8 (1.7) ▲	413 (3.2)	2 (1.5)	400 (3.7)	-11 (1.9) ▼	398 (3.1)	-14 (1.4) ▼
Uzbekistan	396 (3.7)	396 (4.3)	0 (1.7)	401 (3.2)	6 (2.0) ▲	388 (3.7)	-8 (1.8) ▼	389 (3.4)	-7 (1.9) ▼
Palestinian Nat'l Auth.	393 (2.9)	388 (2.9)	-5 (0.9) ▼	409 (3.1)	16 (1.8) ▲	402 (2.8)	9 (1.2) ▲	368 (3.4)	-25 (1.5) ▼
[‡] South Africa (9)	362 (4.0)	346 (4.2)	-16 (0.8) ▼	368 (4.4)	6 (1.7) ▲	374 (3.8)	12 (0.8) ▲	361 (3.7)	-2 (1.6)
[‡] Morocco	327 (3.4)	318 (3.8)	-9 (2.1) ▼	333 (3.4)	6 (2.1) ▲	324 (3.9)	-3 (1.6)	327 (3.4)	0 (1.8)
[‡] New Zealand	502 (4.0)	497 (4.2)	-5 (1.6) ▼	501 (4.2)	-1 (1.9)	508 (4.4)	6 (2.7)	508 (3.8)	6 (2.0) ▲
* Cote d'Ivoire	183 (8.2)	- -	- -	- -	- -	- -	- -	- -	- -
Benchmarking Participants									
Dubai, UAE	547 (3.2)	551 (3.5)	4 (1.1) ▲	559 (3.6)	12 (1.6) ▲	542 (3.2)	-5 (1.4) ▼	536 (3.6)	-11 (1.7) ▼
Sharjah, UAE	499 (4.9)	503 (5.4)	5 (1.5) ▲	513 (5.2)	14 (1.3) ▲	491 (5.0)	-7 (2.2) ▼	485 (5.2)	-13 (2.6) ▼
Abu Dhabi, UAE	443 (3.8)	441 (4.0)	-2 (1.1)	453 (4.0)	9 (1.3) ▲	443 (3.6)	0 (1.5)	435 (3.9)	-8 (1.6) ▼

▲ ▼ Subscale score significantly different from overall score ($p < 0.01$)

Numbers of items are based on the TIMSS 2023 eighth-grade science items included in scaling.

() Standard errors appear in parentheses. Because of rounding some results may appear inconsistent.

See Appendix B.7 for population coverage notes 1, 2, and 3. See Appendix B.10 for sampling guidelines and sampling participation notes †, ‡, and ‡.

‡ Reservations about reliability because the percentage of students with achievement too low for estimation exceeds 15% but does not exceed 25%.

* Average achievement not reliably measured because the percentage of students with achievement too low for estimation exceeds 25%.

A dash (-) indicates comparable data not available because average achievement could not be accurately estimated.

New Zealand did not satisfy guidelines for minimum school participation rates. Achievement could not be reliably estimated for Cote d'Ivoire.

Relative Achievement in Science Cognitive Domains (Grade 8)

Exhibit 2.2.14 shows countries' average achievement estimates in the knowing, applying, and reasoning cognitive domains relative to their overall average achievement estimates (sorted from highest to lowest overall average achievement as the default sort). The exhibit also highlights differences based on a test of statistical significance between the average domain score and the overall science score using an alpha level of 0.01. A smaller alpha level was used to flag statistical significance of subdomain differences to reduce the number of false positives that can be expected due to multiple comparisons across multiple countries dependent sub-scores. Differences are computed for each student and averaged across the country, rather than comparing different groups of students as in previous exhibits in this section. This within-student dependency leads to considerably smaller standard errors (given in parentheses and reported together with the estimates in the exhibit).

In the knowing domain, 17 countries had a relative strength and 11 had a relative weakness. In the applying domain, six countries had a relative strength and seven had a relative weakness. In reasoning, 12 countries had a relative strength and 17 had a relative weakness.

Exhibit 2.2.14: Relative Achievement in Science Cognitive Domains

Country	Overall Science Average Scale Score	Knowing (68 Items)		Applying (91 Items)		Reasoning (53 Items)	
		Average Scale Score	Difference from Overall Score	Average Scale Score	Difference from Overall Score	Average Scale Score	Difference from Overall Score
³ Singapore	606 (5.7)	610 (5.7)	4 (1.6) ▲	605 (5.8)	-2 (1.0)	608 (5.7)	1 (1.4)
Chinese Taipei	572 (2.4)	592 (2.8)	21 (1.6) ▲	574 (2.5)	2 (0.8)	556 (2.4)	-16 (1.3) ▼
[†] Japan	557 (3.1)	558 (3.5)	1 (2.6)	559 (3.5)	2 (2.1)	555 (3.2)	-2 (2.3)
Korea, Rep. of	545 (2.2)	535 (2.9)	-10 (1.8) ▼	547 (2.2)	2 (1.1)	554 (2.3)	9 (1.4) ▲
² England	531 (4.3)	532 (4.6)	1 (2.4)	528 (4.2)	-3 (1.1) ▼	536 (4.8)	5 (1.7) ▲
Finland	531 (3.2)	529 (2.9)	-1 (1.1)	531 (3.0)	0 (2.1)	533 (3.2)	2 (1.4)
^{3†} Türkiye	530 (3.6)	503 (4.1)	-26 (2.5) ▼	537 (3.7)	7 (1.3) ▲	543 (3.9)	14 (2.3) ▲
[†] Hong Kong SAR	528 (4.7)	528 (4.7)	0 (1.1)	527 (5.0)	-1 (1.5)	528 (5.0)	1 (1.3)
² Czech Republic	527 (2.0)	530 (2.1)	3 (1.0) ▲	529 (2.4)	2 (1.4)	519 (2.4)	-8 (1.1) ▼
Ireland	525 (3.5)	519 (3.8)	-6 (1.0) ▼	524 (3.8)	-1 (1.4)	531 (3.4)	6 (1.4) ▲
Hungary	522 (3.3)	531 (3.5)	9 (1.3) ▲	522 (3.3)	0 (1.4)	512 (3.2)	-9 (1.0) ▼
² Sweden	521 (2.9)	514 (3.1)	-7 (1.2) ▼	521 (3.2)	-1 (1.6)	528 (3.1)	7 (1.2) ▲
Australia	520 (3.2)	513 (3.1)	-7 (1.4) ▼	520 (3.2)	0 (1.0)	526 (3.4)	6 (1.2) ▲
² Lithuania	519 (3.0)	515 (2.9)	-4 (1.8)	520 (3.1)	1 (1.7)	521 (3.2)	2 (1.8)
[±] United States	513 (3.9)	503 (4.0)	-11 (1.5) ▼	514 (3.9)	0 (1.2)	521 (4.1)	8 (1.0) ▲
² Austria	512 (2.4)	511 (2.7)	-1 (1.4)	512 (2.4)	0 (0.9)	512 (2.6)	0 (1.4)
Portugal	506 (2.4)	510 (3.0)	5 (1.6) ▲	505 (2.4)	-1 (1.0)	500 (3.3)	-5 (2.6)
Malta	501 (1.6)	496 (2.4)	-5 (1.7) ▼	501 (1.6)	0 (1.1)	505 (2.9)	4 (2.6)
Italy	501 (3.2)	510 (4.1)	10 (2.5) ▲	499 (3.8)	-1 (1.6)	490 (3.5)	-10 (1.2) ▼
² Norway (9)	488 (2.6)	485 (3.0)	-3 (1.8)	487 (2.7)	-2 (0.9)	493 (2.9)	5 (1.2) ▲
United Arab Emirates	486 (2.0)	492 (2.4)	6 (0.8) ▲	486 (2.0)	0 (0.8)	478 (2.0)	-8 (0.5) ▼
France	486 (3.2)	487 (3.6)	1 (2.7)	481 (3.2)	-5 (1.5) ▼	491 (3.4)	5 (1.9) ▲
Qatar	481 (4.3)	485 (4.2)	4 (1.3) ▲	481 (4.4)	0 (1.0)	472 (4.6)	-9 (1.9) ▼
³ Israel	481 (3.6)	475 (3.9)	-5 (1.5) ▼	477 (3.6)	-3 (0.9) ▼	489 (4.5)	8 (2.5) ▲
[±] Romania	466 (4.1)	479 (4.1)	13 (2.0) ▲	462 (4.4)	-4 (1.7)	454 (4.4)	-12 (1.2) ▼
Cyprus	464 (3.0)	472 (3.2)	8 (1.3) ▲	460 (3.0)	-5 (1.1) ▼	461 (3.2)	-3 (1.6)
Oman	456 (2.6)	460 (2.9)	5 (1.2) ▲	457 (2.3)	1 (1.0)	447 (2.4)	-9 (1.6) ▼
[†] Chile	455 (2.7)	461 (2.6)	6 (1.6) ▲	452 (2.7)	-4 (1.1) ▼	454 (2.8)	-1 (1.9)
Bahrain	452 (2.6)	452 (2.6)	0 (1.7)	455 (2.2)	3 (1.7)	441 (3.0)	-11 (1.7) ▼
¹ Georgia	448 (2.9)	461 (3.4)	13 (2.2) ▲	444 (2.6)	-4 (1.1) ▼	434 (2.5)	-14 (1.7) ▼
Kazakhstan	443 (3.0)	429 (3.6)	-14 (1.7) ▼	446 (2.9)	4 (1.0) ▲	446 (3.4)	4 (1.5) ▲
Malaysia	426 (3.7)	413 (4.0)	-14 (0.9) ▼	429 (3.6)	3 (0.7) ▲	433 (3.9)	7 (1.4) ▲
Brazil	420 (2.5)	424 (2.5)	4 (1.0) ▲	418 (2.5)	-2 (1.0)	416 (3.0)	-4 (1.5) ▼
Kuwait	420 (5.8)	430 (6.2)	10 (3.3) ▲	417 (6.0)	-3 (2.2)	406 (5.4)	-14 (1.9) ▼
² Saudi Arabia	419 (3.4)	422 (3.6)	3 (0.8) ▲	419 (3.4)	-1 (1.4)	411 (3.3)	-8 (1.0) ▼
Iran, Islamic Rep. of	419 (3.6)	416 (4.1)	-3 (2.0)	423 (3.4)	4 (1.5) ▲	409 (3.4)	-10 (1.2) ▼
Jordan	413 (3.6)	412 (3.4)	0 (1.3)	414 (3.3)	1 (1.4)	402 (3.7)	-10 (1.4) ▼
Azerbaijan	411 (3.0)	410 (3.6)	-1 (1.9)	415 (2.8)	4 (1.1) ▲	406 (3.9)	-6 (2.5)
Uzbekistan	396 (3.7)	396 (3.5)	0 (1.6)	397 (3.8)	2 (1.9)	387 (4.5)	-8 (1.6) ▼
Palestinian Nat'l Auth.	393 (2.9)	400 (3.0)	7 (1.4) ▲	393 (3.0)	0 (1.4)	376 (3.6)	-17 (1.9) ▼
^ψ South Africa (9)	362 (4.0)	346 (4.1)	-16 (1.3) ▼	372 (3.8)	10 (1.2) ▲	363 (3.9)	0 (1.3)
^ψ Morocco	327 (3.4)	325 (3.9)	-2 (1.3)	324 (3.1)	-3 (1.2) ▼	326 (4.0)	-1 (2.5)
[±] New Zealand	502 (4.0)	491 (4.4)	-11 (1.6) ▼	501 (3.9)	-1 (1.4)	515 (4.3)	13 (1.7) ▲
* Cote d'Ivoire	183 (8.2)	-	-	-	-	-	-
Benchmarking Participants							
Dubai, UAE	547 (3.2)	557 (3.5)	9 (1.4) ▲	546 (3.2)	-1 (0.8)	540 (3.4)	-7 (1.5) ▼
Sharjah, UAE	499 (4.9)	510 (5.6)	11 (1.3) ▲	498 (5.1)	0 (1.7)	485 (4.8)	-14 (2.0) ▼
Abu Dhabi, UAE	443 (3.8)	440 (4.2)	-4 (1.3) ▼	446 (3.7)	3 (0.9) ▲	441 (3.6)	-2 (1.0)

▲ ▼ Subscale score significantly different from overall score ($p < 0.01$)

Numbers of items are based on the TIMSS 2023 eighth-grade science items included in scaling.

() Standard errors appear in parentheses. Because of rounding some results may appear inconsistent.

See Appendix B.7 for population coverage notes 1, 2, and 3. See Appendix B.10 for sampling guidelines and sampling participation notes †, ‡, and ±.

ψ Reservations about reliability because the percentage of students with achievement too low for estimation exceeds 15% but does not exceed 25%.

✕ Average achievement not reliably measured because the percentage of students with achievement too low for estimation exceeds 25%.

A dash (-) indicates comparable data not available because average achievement could not be accurately estimated.

New Zealand did not satisfy guidelines for minimum school participation rates. Achievement could not be reliably estimated for Cote d'Ivoire.

SOURCE: IEA's Trends in International Mathematics and Science Study - TIMSS 2023
Downloaded from <https://timss2023.org/results>

Home Environment

Home Resources

Home Socioeconomic Status – Parents’ Reports, Grade 4

Home socioeconomic status has a strong relationship with fourth-grade students’ achievement in mathematics and science. Higher socioeconomic status is associated with greater average achievement. The TIMSS 2023 *Home Socioeconomic Status* scale (Exhibit 3.1.1) is based on parents’ reports about the number of books and children’s books in the home, as well as self-reported parental education level and occupation. Based on these reports, students were classified as “higher,” “middle,” or “lower,” socioeconomic status.

On average internationally, 30% of students were classified in the “higher” home socioeconomic status category, 48% were classified in the “middle” home socioeconomic status category, and 22% were classified in the “lower” home socioeconomic status category. These percentages varied widely across countries.

There are relatively large achievement differences across the three groups for both mathematics and science. Average achievement differences are particularly large between the “higher” and “lower” home socioeconomic status groups (85 points in mathematics and 91 points in science). In mathematics (Exhibit 3.1.2), students classified as “higher” home socioeconomic status had an average achievement of 544, students classified as “middle” home socioeconomic status had an average achievement of 502, and students classified as “lower” home socioeconomic status had an average achievement of 459. There is a similar pattern in science achievement (Exhibit 3.1.3): students classified as “higher” home socioeconomic status had an average achievement of 535, students classified as “middle” home socioeconomic status had an average achievement of 490, and students classified as “lower” home socioeconomic status had an average achievement of 444.

Exhibit 3.1.1: Home Socioeconomic Status – Parents' Reports

About the Scale

Students were scored according to their parents' reports regarding the four indicators on the *Home Socioeconomic Status* scale. Cut scores divide the scale into three categories. Students with **Higher** socioeconomic status had a score at or above the cut score corresponding to their parents reporting they had more than 25 books and more than 25 children's books in their home, that at least one parent finished university, and that at least one parent had a professional occupation, on average. Students with **Lower** socioeconomic status had a score at or below the cut score corresponding to their parents reporting they had 25 or fewer books and 25 or fewer children's books in the home, that neither parent had gone beyond upper-secondary education, and that neither parent was a small business owner or worked in a clerical or professional occupation, on average. All other students had **Middle** socioeconomic status.

Number of books in the home:

- 1) 0–10
- 2) 11–25
- 3) 26–100
- 4) 101–200
- 5) More than 200

Number of children's books in the home:

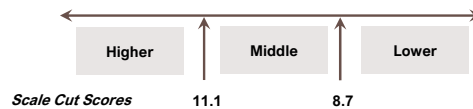
- 1) 0–10
- 2) 11–25
- 3) 26–50
- 4) 51–100
- 5) More than 100

Highest level of education of either parent:

- 1) Finished some primary or lower-secondary or did not go to school
- 2) Finished lower-secondary
- 3) Finished upper-secondary
- 4) Finished post-secondary education
- 5) Finished university or higher

Highest level of occupation of either parent:

- 1) Has never worked outside home for pay, general laborer, or semi-professional (skilled agricultural or fishery worker, craft or trade worker, plant or machine operator)
- 2) Clerical (clerk or service or sales worker)
- 3) Small business owner
- 4) Professional (corporate manager or senior official, professional, or technician or associate professional)



SOURCE: IEA's Trends in International Mathematics and Science Study - TIMSS 2023
Downloaded from <https://timss2023.org/results>

Exhibit 3.1.2: Home Socioeconomic Status – Parents' Reports

Country		Higher Socioeconomic Status		Middle Socioeconomic Status		Lower Socioeconomic Status		Average Scale Score
		Percent of Students	Average Achievement	Percent of Students	Average Achievement	Percent of Students	Average Achievement	
Albania	s	12 (1.7)	551 (9.3)	39 (2.9)	514 (6.7)	48 (3.4)	496 (7.5)	8.8 (0.12)
Armenia		18 (0.9)	534 (4.2)	58 (1.1)	514 (2.7)	24 (1.1)	494 (4.8)	9.8 (0.04)
Azerbaijan		7 (0.6)	552 (8.3)	48 (1.3)	511 (3.1)	45 (1.4)	468 (4.4)	9.0 (0.05)
Bahrain		20 (1.0)	512 (8.1)	62 (0.9)	459 (3.9)	19 (0.8)	422 (6.7)	9.9 (0.03)
Belgium (Flemish)		41 (1.4)	552 (2.3)	47 (1.3)	513 (2.7)	13 (0.8)	483 (4.6)	10.6 (0.05)
Belgium (French)		40 (1.1)	526 (2.6)	46 (0.9)	478 (2.9)	14 (0.7)	447 (4.0)	10.6 (0.04)
Bosnia & Herzegovina	s	20 (1.7)	495 (5.8)	48 (1.8)	463 (3.3)	33 (2.5)	417 (5.1)	9.6 (0.09)
Brazil		7 (1.3)	491 (17.0)	36 (1.2)	427 (3.5)	57 (1.4)	376 (2.4)	8.6 (0.06)
Bulgaria		34 (1.1)	579 (3.3)	39 (1.4)	541 (3.1)	27 (1.6)	457 (7.9)	9.9 (0.08)
Chile	s	10 (0.8)	500 (5.6)	57 (1.4)	453 (3.4)	33 (1.6)	419 (3.7)	9.4 (0.05)
Chinese Taipei		37 (1.3)	632 (2.0)	50 (1.0)	602 (1.8)	14 (0.6)	562 (3.1)	10.6 (0.04)
Cyprus		44 (1.0)	548 (2.3)	48 (0.8)	502 (2.7)	8 (0.5)	467 (7.2)	10.8 (0.04)
Czech Republic	r	47 (1.1)	562 (3.0)	48 (1.0)	521 (2.2)	5 (0.4)	469 (5.9)	10.9 (0.04)
Denmark		49 (1.5)	548 (2.3)	44 (1.2)	509 (2.7)	7 (0.7)	484 (5.1)	11.0 (0.05)
Finland		51 (1.5)	556 (2.5)	44 (1.3)	516 (2.4)	6 (0.5)	476 (5.9)	11.0 (0.05)
France		40 (1.8)	524 (3.3)	49 (1.5)	472 (2.6)	11 (0.9)	430 (4.1)	10.7 (0.07)
Georgia		36 (1.2)	523 (3.3)	52 (1.1)	490 (3.2)	12 (0.8)	461 (9.1)	10.5 (0.04)
Germany	s	42 (1.5)	568 (2.6)	49 (1.3)	523 (2.2)	9 (0.7)	471 (5.7)	10.8 (0.06)
Hong Kong SAR	r	39 (1.6)	627 (4.2)	46 (1.3)	584 (4.3)	15 (1.0)	543 (6.3)	10.6 (0.07)
Hungary	s	47 (1.9)	571 (3.2)	40 (1.7)	521 (3.5)	13 (1.7)	440 (12.6)	10.9 (0.09)
Iran, Islamic Rep. of		9 (0.8)	492 (6.5)	40 (1.2)	445 (3.3)	52 (1.6)	390 (5.0)	8.7 (0.06)
Ireland		50 (1.7)	573 (2.7)	42 (1.5)	535 (3.2)	7 (0.8)	472 (7.5)	11.0 (0.06)
Italy		26 (1.4)	546 (2.6)	51 (1.2)	513 (3.2)	23 (1.1)	485 (4.3)	10.0 (0.06)
Japan		25 (1.4)	629 (3.0)	62 (1.2)	586 (2.0)	13 (0.7)	553 (3.7)	10.2 (0.04)
Jordan		6 (0.7)	484 (8.4)	49 (1.3)	444 (5.2)	45 (1.5)	406 (7.1)	8.9 (0.05)
Kazakhstan		10 (0.8)	527 (9.0)	66 (1.2)	492 (3.5)	23 (1.3)	458 (4.8)	9.6 (0.04)
Korea, Rep. of		65 (1.5)	613 (2.5)	32 (1.3)	568 (3.3)	3 (0.4)	517 (10.4)	11.6 (0.05)
Kosovo	s	16 (1.2)	510 (6.3)	51 (1.3)	465 (3.8)	33 (1.6)	425 (7.0)	9.5 (0.06)
Kuwait		13 (1.0)	429 (7.8)	70 (1.2)	387 (4.6)	17 (1.0)	352 (7.8)	9.8 (0.04)
Latvia	s	39 (1.5)	566 (4.6)	49 (1.4)	532 (3.4)	12 (1.2)	490 (8.4)	10.6 (0.06)
Lithuania	s	42 (1.4)	595 (3.5)	50 (1.2)	556 (3.0)	8 (0.8)	494 (6.5)	10.7 (0.05)
Macao SAR		30 (0.6)	609 (2.2)	53 (0.6)	578 (1.4)	17 (0.5)	550 (2.8)	10.3 (0.02)
Montenegro	r	31 (1.1)	506 (3.4)	53 (0.9)	475 (2.3)	16 (0.8)	447 (4.4)	10.2 (0.04)
Morocco		3 (0.4)	458 (12.3)	19 (0.9)	428 (5.8)	78 (1.1)	384 (5.1)	7.2 (0.06)
North Macedonia		18 (1.2)	522 (4.3)	47 (1.2)	482 (3.6)	35 (1.5)	444 (5.0)	9.4 (0.08)
Norway (5)	s	54 (1.7)	560 (2.5)	42 (1.6)	526 (3.8)	4 (0.5)	486 (9.7)	11.5 (0.05)
Oman		10 (0.5)	469 (7.1)	59 (0.7)	430 (4.6)	31 (0.8)	389 (4.0)	9.4 (0.03)
Poland		47 (1.3)	571 (2.5)	46 (1.1)	533 (1.9)	7 (0.7)	487 (7.2)	10.9 (0.05)
Portugal		32 (1.6)	555 (3.2)	46 (1.1)	513 (3.3)	21 (1.2)	476 (4.1)	10.2 (0.07)
Qatar	s	22 (1.3)	506 (6.1)	65 (1.3)	460 (3.9)	13 (1.0)	413 (6.4)	10.1 (0.05)
Romania	s	31 (2.7)	595 (5.2)	44 (2.4)	556 (3.4)	25 (2.7)	504 (9.1)	10.1 (0.13)
Saudi Arabia	r	8 (0.5)	451 (6.3)	61 (1.1)	431 (4.3)	32 (1.2)	402 (5.6)	9.2 (0.04)
Serbia		28 (1.2)	564 (2.8)	52 (1.3)	524 (3.7)	21 (1.4)	468 (6.7)	10.1 (0.06)
Singapore	r	54 (0.8)	653 (2.4)	43 (0.7)	603 (3.2)	4 (0.3)	544 (9.0)	11.2 (0.03)
Slovak Republic		33 (1.3)	552 (2.5)	48 (1.2)	518 (2.6)	18 (1.2)	440 (8.8)	10.2 (0.06)
Slovenia		45 (1.2)	541 (2.7)	47 (1.1)	501 (2.1)	8 (0.5)	476 (4.7)	10.8 (0.03)
South Africa (5)	r	6 (0.7)	507 (12.9)	42 (1.0)	390 (5.0)	53 (1.1)	334 (3.2)	8.8 (0.04)
Spain		34 (1.1)	534 (2.7)	47 (0.8)	497 (1.9)	19 (1.0)	455 (3.6)	10.3 (0.05)
Sweden	r	55 (1.8)	559 (2.3)	39 (1.4)	512 (3.4)	6 (0.6)	482 (4.7)	11.3 (0.07)
Türkiye (5)		25 (1.6)	616 (4.3)	48 (1.3)	554 (4.0)	26 (1.8)	501 (5.8)	9.9 (0.08)
Uzbekistan		6 (0.6)	497 (5.7)	53 (1.1)	451 (3.2)	41 (1.2)	426 (3.7)	9.1 (0.04)
International Average		30 (0.2)	544 (0.8)	48 (0.2)	502 (0.5)	22 (0.2)	459 (0.9)	
Canada	x	55 (1.2)	542 (3.0)	41 (1.1)	505 (2.9)	4 (0.4)	468 (8.6)	11.3 (0.04)
United Arab Emirates	x	25 (0.5)	557 (2.0)	65 (0.5)	506 (1.7)	11 (0.3)	452 (4.0)	10.3 (0.01)
New Zealand	y	--	--	--	--	--	--	--
Australia		--	--	--	--	--	--	--
England		--	--	--	--	--	--	--
Netherlands		--	--	--	--	--	--	--
United States		--	--	--	--	--	--	--
Benchmarking Participants								
Sharjah, UAE	s	20 (0.9)	553 (4.7)	70 (1.0)	516 (4.2)	10 (0.7)	480 (8.9)	10.1 (0.03)
Abu Dhabi, UAE	x	25 (0.9)	529 (3.4)	64 (1.0)	479 (2.9)	10 (0.6)	412 (5.6)	10.3 (0.02)
Dubai, UAE	x	36 (0.9)	595 (2.5)	59 (1.0)	555 (2.9)	5 (0.4)	483 (9.7)	10.7 (0.03)
Quebec, Canada	x	55 (1.8)	539 (3.5)	41 (1.6)	508 (3.3)	4 (0.6)	460 (11.7)	11.3 (0.06)
Ontario, Canada	y	--	--	--	--	--	--	--

This TIMSS context questionnaire scale was established in 2019 based on the combined response distribution of countries that participated in TIMSS 2019. To provide a point of reference for country comparisons, the scale centerpoint of 10 was located at the mean of the combined distribution. The units of the scale were chosen so that 2 scale score points corresponded to the standard deviation of the distribution.

() Standard errors appear in parentheses. Because of rounding some results may appear inconsistent.

An "r" indicates data are available for at least 70% but less than 85% of the students.

An "s" indicates data are available for at least 50% but less than 70% of the students.

An "x" indicates data are available for at least 40% but less than 50% of the students—interpret with caution.

A "y" indicates data are available for less than 40% of the students.

A dash (-) indicates comparable data not available.

SOURCE: IEA's Trends in International Mathematics and Science Study - TIMSS 2023
Downloaded from <https://timss2023.org/results>

Exhibit 3.1.3: Home Socioeconomic Status – Parents' Reports

Country		Higher Socioeconomic Status		Middle Socioeconomic Status		Lower Socioeconomic Status		Average Scale Score
		Percent of Students	Average Achievement	Percent of Students	Average Achievement	Percent of Students	Average Achievement	
Albania	s	12 (1.7)	527 (8.9)	39 (2.9)	491 (6.0)	48 (3.4)	477 (6.4)	8.8 (0.12)
Armenia		18 (0.9)	477 (4.2)	58 (1.1)	457 (2.6)	24 (1.1)	442 (4.7)	9.8 (0.04)
Azerbaijan		7 (0.6)	466 (7.8)	48 (1.3)	434 (2.9)	45 (1.4)	402 (4.1)	9.0 (0.05)
Bahrain		20 (1.0)	526 (7.6)	62 (0.9)	475 (3.9)	19 (0.8)	428 (7.1)	9.9 (0.03)
Belgium (Flemish)		41 (1.4)	524 (2.3)	47 (1.3)	479 (3.1)	13 (0.8)	436 (5.8)	10.6 (0.05)
Belgium (French)		40 (1.1)	522 (2.3)	46 (0.9)	467 (3.1)	14 (0.7)	430 (4.6)	10.6 (0.04)
Bosnia & Herzegovina	s	20 (1.7)	491 (5.5)	48 (1.8)	462 (5.1)	33 (2.5)	414 (7.7)	9.6 (0.09)
Brazil		7 (1.3)	520 (12.8)	36 (1.2)	460 (3.6)	57 (1.4)	396 (3.1)	8.6 (0.06)
Bulgaria		34 (1.1)	587 (3.7)	39 (1.4)	546 (3.7)	27 (1.6)	440 (11.0)	9.9 (0.08)
Chile	s	10 (0.8)	537 (6.1)	57 (1.4)	490 (3.1)	33 (1.6)	454 (3.2)	9.4 (0.05)
Chinese Taipei		37 (1.3)	602 (1.7)	50 (1.0)	565 (2.1)	14 (0.6)	523 (3.6)	10.6 (0.04)
Cyprus		44 (1.0)	525 (3.1)	48 (0.8)	470 (3.2)	8 (0.5)	418 (6.9)	10.8 (0.04)
Czech Republic	r	47 (1.1)	557 (3.0)	48 (1.0)	516 (2.3)	5 (0.4)	467 (6.1)	10.9 (0.04)
Denmark		49 (1.5)	552 (2.6)	44 (1.2)	506 (2.6)	7 (0.7)	467 (5.8)	11.0 (0.05)
Finland		51 (1.5)	572 (2.3)	44 (1.3)	528 (3.0)	6 (0.5)	473 (7.0)	11.0 (0.05)
France		40 (1.8)	528 (2.9)	49 (1.5)	476 (2.6)	11 (0.9)	432 (4.8)	10.7 (0.07)
Georgia		36 (1.2)	484 (3.3)	52 (1.1)	459 (3.7)	12 (0.8)	441 (9.4)	10.5 (0.04)
Germany	s	42 (1.5)	569 (3.1)	49 (1.3)	516 (3.2)	9 (0.7)	443 (7.2)	10.8 (0.06)
Hong Kong SAR	r	39 (1.6)	580 (4.6)	46 (1.3)	529 (4.2)	15 (1.0)	493 (7.2)	10.6 (0.07)
Hungary	s	47 (1.9)	573 (3.8)	40 (1.7)	525 (3.1)	13 (1.7)	445 (12.7)	10.9 (0.09)
Iran, Islamic Rep. of		9 (0.8)	516 (7.4)	40 (1.2)	464 (3.8)	52 (1.6)	397 (5.1)	8.7 (0.06)
Ireland		50 (1.7)	560 (3.5)	42 (1.5)	518 (3.5)	7 (0.8)	462 (7.3)	11.0 (0.06)
Italy		26 (1.4)	547 (2.5)	51 (1.2)	511 (2.7)	23 (1.1)	477 (3.7)	10.0 (0.06)
Japan		25 (1.4)	592 (3.4)	62 (1.2)	550 (2.1)	13 (0.7)	517 (3.2)	10.2 (0.04)
Jordan		6 (0.7)	483 (8.0)	49 (1.3)	438 (4.8)	45 (1.5)	395 (6.8)	8.9 (0.05)
Kazakhstan		10 (0.8)	514 (9.6)	66 (1.2)	471 (3.3)	23 (1.3)	437 (4.7)	9.6 (0.04)
Korea, Rep. of		65 (1.5)	601 (2.3)	32 (1.3)	557 (3.0)	3 (0.4)	514 (9.8)	11.6 (0.05)
Kosovo	s	16 (1.2)	456 (6.7)	51 (1.3)	418 (4.1)	33 (1.6)	381 (6.0)	9.5 (0.06)
Kuwait		13 (1.0)	430 (8.9)	70 (1.2)	380 (5.5)	17 (1.0)	336 (7.6)	9.8 (0.04)
Latvia	s	39 (1.5)	561 (4.4)	49 (1.4)	523 (3.4)	12 (1.2)	481 (9.5)	10.6 (0.06)
Lithuania	s	42 (1.4)	568 (3.3)	50 (1.2)	533 (3.4)	8 (0.8)	471 (7.1)	10.7 (0.05)
Macao SAR		30 (0.6)	565 (2.4)	53 (0.6)	530 (1.8)	17 (0.5)	506 (2.7)	10.3 (0.02)
Montenegro	r	31 (1.1)	492 (3.2)	53 (0.9)	458 (2.5)	16 (0.8)	421 (4.2)	10.2 (0.04)
Morocco		3 (0.4)	445 (12.5)	19 (0.9)	421 (7.2)	78 (1.1)	383 (5.7)	7.2 (0.06)
North Macedonia		18 (1.2)	494 (4.9)	47 (1.2)	446 (4.1)	35 (1.5)	405 (4.6)	9.4 (0.08)
Norway (5)	s	54 (1.7)	565 (2.8)	42 (1.6)	523 (4.2)	4 (0.5)	449 (12.1)	11.5 (0.05)
Oman		10 (0.5)	491 (6.9)	59 (0.7)	443 (4.7)	31 (0.8)	397 (4.5)	9.4 (0.03)
Poland		47 (1.3)	576 (2.8)	46 (1.1)	536 (2.3)	7 (0.7)	491 (6.9)	10.9 (0.05)
Portugal		32 (1.6)	544 (2.4)	46 (1.1)	505 (2.7)	21 (1.2)	476 (3.3)	10.2 (0.07)
Qatar	s	22 (1.3)	521 (6.6)	65 (1.3)	473 (4.1)	13 (1.0)	420 (6.4)	10.1 (0.05)
Romania	s	31 (2.7)	576 (4.9)	44 (2.4)	538 (3.2)	25 (2.7)	498 (8.8)	10.1 (0.13)
Saudi Arabia	r	8 (0.5)	465 (7.8)	61 (1.1)	442 (4.0)	32 (1.2)	407 (5.8)	9.2 (0.04)
Serbia		28 (1.2)	547 (3.0)	52 (1.3)	509 (3.4)	21 (1.4)	465 (6.7)	10.1 (0.06)
Singapore	r	54 (0.8)	647 (2.1)	43 (0.7)	592 (2.9)	4 (0.3)	531 (8.7)	11.2 (0.03)
Slovak Republic		33 (1.3)	565 (2.8)	48 (1.2)	526 (2.6)	18 (1.2)	429 (9.3)	10.2 (0.06)
Slovenia		45 (1.2)	558 (2.6)	47 (1.1)	513 (2.9)	8 (0.5)	460 (6.7)	10.8 (0.03)
South Africa (5)	r	6 (0.7)	493 (17.6)	42 (1.0)	344 (7.2)	53 (1.1)	272 (4.5)	8.8 (0.04)
Spain		34 (1.1)	540 (2.7)	47 (0.8)	502 (1.7)	19 (1.0)	464 (3.3)	10.3 (0.05)
Sweden	r	55 (1.8)	569 (2.7)	39 (1.4)	511 (3.5)	6 (0.6)	458 (5.2)	11.3 (0.07)
Türkiye (5)		25 (1.6)	621 (3.3)	48 (1.3)	570 (3.2)	26 (1.8)	529 (5.5)	9.9 (0.08)
Uzbekistan		6 (0.6)	462 (5.6)	53 (1.1)	419 (3.6)	41 (1.2)	395 (4.2)	9.1 (0.04)
International Average		30 (0.2)	535 (0.8)	48 (0.2)	490 (0.5)	22 (0.2)	444 (0.9)	
Canada	x	55 (1.2)	555 (2.8)	41 (1.1)	515 (2.9)	4 (0.4)	476 (8.2)	11.3 (0.04)
United Arab Emirates	x	25 (0.5)	562 (2.1)	65 (0.5)	507 (2.3)	11 (0.3)	440 (4.4)	10.3 (0.01)
New Zealand	y	--	--	--	--	--	--	--
Australia		--	--	--	--	--	--	--
England		--	--	--	--	--	--	--
Netherlands		--	--	--	--	--	--	--
United States		--	--	--	--	--	--	--
Benchmarking Participants								
Sharjah, UAE	s	20 (0.9)	559 (5.2)	70 (1.0)	519 (4.5)	10 (0.7)	469 (9.3)	10.1 (0.03)
Abu Dhabi, UAE	x	25 (0.9)	526 (4.2)	64 (1.0)	472 (4.2)	10 (0.6)	384 (6.3)	10.3 (0.02)
Dubai, UAE	x	36 (0.9)	606 (2.7)	59 (1.0)	563 (3.0)	5 (0.4)	482 (11.2)	10.7 (0.03)
Quebec, Canada	x	55 (1.8)	535 (3.5)	41 (1.6)	498 (3.9)	4 (0.6)	446 (10.1)	11.3 (0.06)
Ontario, Canada	y	--	--	--	--	--	--	--

This TIMSS context questionnaire scale was established in 2019 based on the combined response distribution of countries that participated in TIMSS 2019. To provide a point of reference for country comparisons, the scale centerpoint of 10 was located at the mean of the combined distribution. The units of the scale were chosen so that 2 scale score points corresponded to the standard deviation of the distribution.

() Standard errors appear in parentheses. Because of rounding some results may appear inconsistent.

An "r" indicates data are available for at least 70% but less than 85% of the students.

An "s" indicates data are available for at least 50% but less than 70% of the students.

An "x" indicates data are available for at least 40% but less than 50% of the students—interpret with caution.

A "y" indicates data are available for less than 40% of the students.

A dash (-) indicates comparable data not available.

SOURCE: IEA's Trends in International Mathematics and Science Study - TIMSS 2023
Downloaded from <https://timss2023.org/results>

Home Educational Resources, Grade 8

Availability of home resources for learning has a strong, positive relationship with eighth-grade students' mathematics and science achievement internationally. The TIMSS 2023 *Home Educational Resources* scale (Exhibit 3.1.4) is based on students' reports about the number of books and other study supports in their homes, as well as the highest level of their parents' education. Based on these reports, students were classified as having "many resources," "some resources," or "few resources."

Internationally, 26 percent of students were classified as having "many resources," 45 percent were classified as having "some resources," and 28 percent were classified as having "few resources." There is considerable variation in these percentages across countries.

In both mathematics and science (Exhibits 3.1.5 and 3.1.6, respectively), students with "many resources" had much higher average achievement internationally than students with "few resources" (524 vs. 429 in mathematics and 525 vs. 425 in science). For both subjects, students with "some resources" had average achievement scores between those with "many resources" and those with "few resources" (474 in mathematics and 473 in science).

Exhibit 3.1.4: Home Educational Resources

About the Scale

Students were scored according to their reports regarding the availability of three resources on the *Home Educational Resources* scale. Cut scores divide the scale into three categories. Students with **Many Resources** had a score at or above the cut score corresponding to reporting they had more than 25 books and both study supports in their home and that at least one parent finished university, on average. Students with **Few Resources** had a score at or below the cut score corresponding to reporting they had 10 or fewer books and both study supports in the home and that neither parent had gone beyond upper-secondary education, on average. All other students had **Some Resources**.

Number of books in the home:

- 1) 0–10
- 2) 11–25
- 3) 26–100
- 4) 101–200
- 5) More than 200

Number of home study supports:

- 1) Neither internet access nor own room
- 2) Either internet access or own room
- 3) Both internet access and own room

Highest level of education of either parent:

- 1) Finished some primary or lower-secondary or did not go to school
- 2) Finished lower-secondary
- 3) Finished upper-secondary
- 4) Finished post-secondary education
- 5) Finished university or higher



SOURCE: IEA's Trends in International Mathematics and Science Study - TIMSS 2023
 Downloaded from <https://timss2023.org/results>

Exhibit 3.1.5: Home Educational Resources

Country	Many Resources		Some Resources		Few Resources		Average Scale Score
	Percent of Students	Average Achievement	Percent of Students	Average Achievement	Percent of Students	Average Achievement	
Australia	42 (1.2)	550 (3.1)	45 (0.9)	495 (3.9)	13 (0.8)	440 (7.0)	11.1 (0.04)
Austria	36 (1.1)	544 (2.3)	44 (0.9)	511 (2.3)	19 (1.0)	456 (5.1)	10.8 (0.04)
Azerbaijan	12 (0.6)	534 (6.0)	50 (1.0)	491 (3.4)	38 (1.2)	450 (5.6)	9.7 (0.04)
Bahrain	20 (0.7)	476 (4.2)	48 (0.8)	430 (2.7)	33 (0.8)	398 (3.6)	10.1 (0.02)
Brazil	8 (0.8)	466 (14.2)	34 (0.8)	403 (3.2)	58 (1.0)	354 (2.0)	9.3 (0.03)
Chile	16 (0.8)	472 (4.9)	51 (0.9)	422 (3.2)	34 (1.0)	383 (4.3)	10.0 (0.03)
Chinese Taipei	36 (1.0)	644 (3.9)	43 (0.8)	598 (3.2)	21 (0.8)	539 (3.9)	10.7 (0.04)
Cote d'Ivoire	2 ~	~	15 (1.3)	293 (13.5)	82 (1.9)	257 (2.3)	7.5 (0.10)
Cyprus	42 (1.0)	532 (3.8)	43 (0.9)	483 (3.0)	15 (0.7)	430 (4.4)	10.9 (0.03)
Czech Republic	32 (1.0)	559 (2.6)	53 (0.8)	511 (2.2)	15 (0.8)	459 (4.0)	10.7 (0.03)
England	36 (1.6)	575 (4.5)	44 (1.2)	518 (5.2)	20 (1.1)	459 (6.0)	10.8 (0.05)
Finland	42 (1.2)	536 (2.7)	46 (0.9)	493 (2.4)	12 (0.6)	448 (4.4)	11.0 (0.03)
France	32 (1.3)	527 (2.6)	46 (1.0)	471 (2.8)	22 (1.1)	424 (4.7)	10.7 (0.05)
Georgia	36 (1.1)	495 (3.6)	47 (0.9)	459 (3.6)	17 (0.8)	431 (8.2)	10.8 (0.04)
Hong Kong SAR	26 (1.0)	623 (8.7)	42 (0.8)	574 (4.9)	32 (0.9)	542 (6.1)	10.3 (0.04)
Hungary	42 (1.4)	554 (3.3)	41 (1.2)	494 (2.9)	17 (1.4)	415 (6.3)	10.9 (0.05)
Iran, Islamic Rep. of	16 (0.9)	487 (5.5)	39 (0.9)	436 (3.5)	44 (1.4)	391 (3.5)	9.6 (0.05)
Ireland	39 (1.3)	559 (2.6)	45 (1.1)	515 (2.4)	16 (0.8)	459 (5.8)	10.9 (0.04)
Israel ^s	29 (1.3)	548 (5.8)	60 (1.2)	486 (3.9)	11 (0.7)	412 (6.6)	11.0 (0.04)
Italy	33 (1.5)	541 (2.9)	42 (0.9)	499 (3.1)	25 (1.4)	451 (3.9)	10.5 (0.06)
Japan	43 (1.1)	621 (4.2)	46 (0.9)	585 (3.4)	12 (0.7)	541 (4.8)	11.0 (0.03)
Jordan	11 (0.6)	419 (6.4)	49 (0.8)	396 (3.4)	39 (1.0)	371 (3.6)	9.7 (0.03)
Kazakhstan	13 (0.8)	495 (7.5)	58 (0.8)	458 (3.1)	30 (1.0)	431 (4.0)	10.0 (0.03)
Korea, Rep. of	56 (1.2)	625 (3.1)	34 (0.9)	573 (3.0)	10 (0.7)	518 (6.3)	11.4 (0.04)
Kuwait	13 (1.0)	429 (11.1)	50 (1.0)	409 (4.9)	37 (1.2)	379 (6.0)	9.8 (0.04)
Lithuania	31 (1.3)	558 (3.9)	53 (0.9)	504 (2.8)	16 (0.9)	456 (4.1)	10.7 (0.04)
Malaysia	13 (0.7)	473 (4.8)	55 (0.7)	415 (3.1)	32 (1.0)	378 (3.7)	9.9 (0.03)
Malta	32 (0.7)	542 (2.4)	47 (0.7)	498 (1.6)	21 (0.6)	444 (2.9)	10.7 (0.02)
Morocco	5 (0.4)	426 (6.3)	30 (0.8)	395 (3.8)	65 (1.0)	367 (3.0)	8.6 (0.05)
Norway (9)	47 (1.1)	533 (2.5)	42 (0.8)	486 (2.4)	12 (0.6)	438 (3.5)	11.2 (0.03)
Oman	16 (0.6)	449 (4.2)	48 (0.6)	420 (3.1)	36 (0.7)	388 (3.0)	9.8 (0.03)
Palestinian Nat'l Auth.	12 (0.5)	410 (4.8)	48 (0.7)	395 (3.0)	41 (0.8)	361 (3.6)	9.6 (0.03)
Portugal	26 (1.2)	524 (2.9)	42 (0.9)	480 (2.6)	32 (1.3)	433 (2.8)	10.3 (0.05)
Qatar	24 (1.2)	494 (6.5)	51 (1.0)	458 (4.1)	25 (1.1)	408 (4.5)	10.3 (0.05)
Romania	28 (1.7)	553 (5.5)	48 (1.2)	496 (4.5)	24 (1.4)	437 (7.1)	10.4 (0.06)
Saudi Arabia	12 (0.6)	427 (5.0)	48 (0.8)	408 (3.8)	40 (0.9)	377 (3.4)	9.7 (0.03)
Singapore	33 (1.3)	649 (4.7)	47 (0.9)	601 (5.5)	20 (1.2)	545 (9.2)	10.6 (0.05)
South Africa (9)	5 (0.5)	468 (11.2)	39 (1.0)	405 (3.4)	56 (1.2)	383 (2.9)	9.1 (0.05)
Sweden	42 (1.5)	559 (2.8)	43 (1.1)	503 (2.3)	15 (0.7)	459 (3.2)	11.0 (0.04)
Türkiye	27 (1.4)	584 (5.5)	42 (1.0)	500 (3.9)	31 (1.4)	453 (5.5)	10.2 (0.06)
United Arab Emirates	24 (0.4)	537 (2.6)	50 (0.5)	490 (1.9)	25 (0.5)	447 (2.4)	10.3 (0.02)
United States	31 (1.4)	545 (4.2)	45 (0.9)	479 (3.6)	23 (1.0)	437 (4.8)	10.6 (0.04)
Uzbekistan	12 (0.8)	457 (8.0)	54 (1.0)	428 (4.6)	34 (1.3)	399 (4.0)	9.8 (0.04)
International Average	26 (0.2)	524 (0.9)	45 (0.1)	474 (0.6)	28 (0.2)	429 (0.7)	
Benchmarking Participants							
Abu Dhabi, UAE	22 (0.6)	503 (3.4)	50 (0.7)	459 (2.8)	28 (0.7)	418 (3.1)	10.2 (0.03)
Dubai, UAE	33 (0.8)	584 (2.8)	48 (0.9)	541 (3.1)	19 (1.2)	495 (5.5)	10.7 (0.04)
Sharjah, UAE	22 (1.2)	529 (9.9)	53 (1.1)	497 (4.0)	25 (0.8)	467 (4.8)	10.2 (0.03)

This TIMSS context questionnaire scale was established in 2011 based on the combined response distribution of countries that participated in TIMSS 2011. To provide a point of reference for country comparisons, the scale centerpoint of 10 was located at the mean of the combined distribution. The units of the scale were chosen so that 2 scale score points corresponded to the standard deviation of the distribution.

() Standard errors appear in parentheses. Because of rounding some results may appear inconsistent.

An "s" indicates data are available for at least 50% but less than 70% of the students.

A tilde (~) indicates insufficient data to report result.

SOURCE: IEA's Trends in International Mathematics and Science Study - TIMSS 2023
Downloaded from <https://timss2023.org/results>

Exhibit 3.1.6: Home Educational Resources

Country	Many Resources		Some Resources		Few Resources		Average Scale Score
	Percent of Students	Average Achievement	Percent of Students	Average Achievement	Percent of Students	Average Achievement	
Australia	42 (1.2)	564 (2.8)	45 (0.9)	508 (3.4)	13 (0.8)	443 (6.9)	11.1 (0.04)
Austria	36 (1.1)	554 (2.5)	44 (0.9)	509 (2.6)	19 (1.0)	441 (5.1)	10.8 (0.04)
Azerbaijan	12 (0.6)	457 (5.1)	50 (1.0)	421 (3.0)	38 (1.2)	387 (3.8)	9.7 (0.04)
Bahrain	20 (0.7)	506 (5.1)	48 (0.8)	457 (2.8)	33 (0.8)	419 (3.5)	10.1 (0.02)
Brazil	8 (0.8)	499 (11.6)	34 (0.8)	446 (3.3)	58 (1.0)	397 (1.7)	9.3 (0.03)
Chile	16 (0.8)	509 (4.1)	51 (0.9)	463 (2.7)	34 (1.0)	422 (3.6)	10.0 (0.03)
Chinese Taipei	36 (1.0)	612 (2.9)	43 (0.8)	567 (2.7)	21 (0.8)	513 (3.4)	10.7 (0.04)
Cote d'Ivoire	2 ~	~	15 (1.3)	243 (22.1)	82 (1.9)	171 (4.3)	7.5 (0.10)
Cyprus	42 (1.0)	504 (3.6)	43 (0.9)	452 (3.1)	15 (0.7)	401 (4.9)	10.9 (0.03)
Czech Republic	32 (1.0)	566 (2.3)	53 (0.8)	521 (1.9)	15 (0.8)	467 (3.8)	10.7 (0.03)
England	36 (1.6)	584 (4.6)	44 (1.2)	523 (4.5)	20 (1.1)	461 (5.7)	10.8 (0.05)
Finland	42 (1.2)	570 (3.0)	46 (0.9)	518 (3.2)	12 (0.6)	458 (5.4)	11.0 (0.03)
France	32 (1.3)	536 (2.9)	46 (1.0)	479 (2.8)	22 (1.1)	429 (4.4)	10.7 (0.05)
Georgia	36 (1.1)	474 (2.7)	47 (0.9)	443 (3.5)	17 (0.8)	410 (8.4)	10.8 (0.04)
Hong Kong SAR	26 (1.0)	572 (8.9)	42 (0.8)	525 (4.5)	32 (0.9)	501 (5.6)	10.3 (0.04)
Hungary	42 (1.4)	565 (2.7)	41 (1.2)	512 (2.8)	17 (1.4)	438 (5.9)	10.9 (0.05)
Iran, Islamic Rep. of	16 (0.9)	484 (4.9)	39 (0.9)	433 (3.3)	44 (1.4)	386 (3.7)	9.6 (0.05)
Ireland	39 (1.3)	567 (2.8)	45 (1.1)	516 (4.1)	16 (0.8)	460 (5.6)	10.9 (0.04)
Israel ^s	29 (1.3)	541 (5.7)	60 (1.2)	480 (3.8)	11 (0.7)	407 (6.3)	11.0 (0.04)
Italy	33 (1.5)	541 (2.8)	42 (0.9)	499 (3.3)	25 (1.4)	450 (3.8)	10.5 (0.06)
Japan	43 (1.1)	581 (4.0)	46 (0.9)	549 (3.3)	12 (0.7)	508 (4.4)	11.0 (0.03)
Jordan	11 (0.6)	446 (6.9)	49 (0.8)	423 (3.9)	39 (1.0)	393 (3.9)	9.7 (0.03)
Kazakhstan	13 (0.8)	484 (6.4)	58 (0.8)	446 (2.8)	30 (1.0)	420 (3.3)	10.0 (0.03)
Korea, Rep. of	56 (1.2)	569 (2.3)	34 (0.9)	527 (2.7)	10 (0.7)	481 (5.9)	11.4 (0.04)
Kuwait	13 (1.0)	460 (10.8)	50 (1.0)	434 (5.5)	37 (1.2)	394 (6.2)	9.8 (0.04)
Lithuania	31 (1.3)	561 (3.5)	53 (0.9)	511 (2.6)	16 (0.9)	463 (4.2)	10.7 (0.04)
Malaysia	13 (0.7)	491 (4.4)	55 (0.7)	432 (3.4)	32 (1.0)	390 (4.1)	9.9 (0.03)
Malta	32 (0.7)	554 (2.7)	47 (0.7)	498 (2.1)	21 (0.6)	435 (3.8)	10.7 (0.02)
Morocco	5 (0.4)	375 (7.6)	30 (0.8)	346 (4.0)	65 (1.0)	315 (3.6)	8.6 (0.05)
Norway (9)	47 (1.1)	526 (2.6)	42 (0.8)	473 (2.5)	12 (0.6)	413 (4.3)	11.2 (0.03)
Oman	16 (0.6)	499 (3.9)	48 (0.6)	466 (2.9)	36 (0.7)	432 (3.1)	9.8 (0.03)
Palestinian Nat'l Auth.	12 (0.5)	424 (5.0)	48 (0.7)	407 (3.2)	41 (0.8)	370 (3.2)	9.6 (0.03)
Portugal	26 (1.2)	551 (2.9)	42 (0.9)	512 (2.3)	32 (1.3)	464 (2.6)	10.3 (0.05)
Qatar	24 (1.2)	527 (6.2)	51 (1.0)	488 (4.3)	25 (1.1)	435 (4.6)	10.3 (0.05)
Romania	28 (1.7)	512 (4.8)	48 (1.2)	470 (3.8)	24 (1.4)	418 (5.8)	10.4 (0.06)
Saudi Arabia	12 (0.6)	452 (5.9)	48 (0.8)	434 (4.0)	40 (0.9)	396 (3.3)	9.7 (0.03)
Singapore	33 (1.3)	652 (4.2)	47 (0.9)	602 (5.2)	20 (1.2)	542 (8.5)	10.6 (0.05)
South Africa (9)	5 (0.5)	468 (14.6)	39 (1.0)	379 (4.4)	56 (1.2)	341 (3.7)	9.1 (0.05)
Sweden	42 (1.5)	574 (3.1)	43 (1.1)	503 (2.8)	15 (0.7)	444 (4.3)	11.0 (0.04)
Türkiye	27 (1.4)	590 (4.3)	42 (1.0)	523 (3.3)	31 (1.4)	484 (5.2)	10.2 (0.06)
United Arab Emirates	24 (0.4)	543 (2.7)	50 (0.5)	490 (2.3)	25 (0.5)	435 (2.3)	10.3 (0.02)
United States	31 (1.4)	571 (3.7)	45 (0.9)	506 (3.5)	23 (1.0)	459 (4.2)	10.6 (0.04)
Uzbekistan	12 (0.8)	431 (5.6)	54 (1.0)	403 (3.8)	34 (1.3)	374 (3.8)	9.8 (0.04)
International Average	26 (0.2)	525 (0.8)	45 (0.1)	473 (0.7)	28 (0.2)	425 (0.7)	
Benchmarking Participants							
Abu Dhabi, UAE	22 (0.6)	506 (4.4)	50 (0.7)	452 (3.9)	28 (0.7)	394 (4.0)	10.2 (0.03)
Dubai, UAE	33 (0.8)	589 (2.9)	48 (0.9)	544 (3.6)	19 (1.2)	485 (5.0)	10.7 (0.04)
Sharjah, UAE	22 (1.2)	540 (10.3)	53 (1.1)	501 (4.1)	25 (0.8)	464 (4.6)	10.2 (0.03)

This TIMSS context questionnaire scale was established in 2011 based on the combined response distribution of countries that participated in TIMSS 2011. To provide a point of reference for country comparisons, the scale centerpoint of 10 was located at the mean of the combined distribution. The units of the scale were chosen so that 2 scale score points corresponded to the standard deviation of the distribution.

() Standard errors appear in parentheses. Because of rounding some results may appear inconsistent.

An "s" indicates data are available for at least 50% but less than 70% of the students.

A tilde (~) indicates insufficient data to report result.

SOURCE: IEA's Trends in International Mathematics and Science Study - TIMSS 2023
Downloaded from <https://timss2023.org/results>

Early Preparation for School

Home Early Literacy and Numeracy Activities – Parents’ Reports

Engagement in educational activities before primary school has a modest positive relationship with fourth-grade students’ mathematics and science achievement. The TIMSS 2023 *Early Literacy and Numeracy Activities* scale (Exhibit 3.2.1) focuses specifically on literacy and numeracy activities and summarizes parents’ reports about how often they engaged with their child in eight literacy activities and eight numeracy activities before their child began primary school. Based on these responses, students were classified as engaging in these types of activities “very often,” “often,” or “sometimes” before beginning primary school.

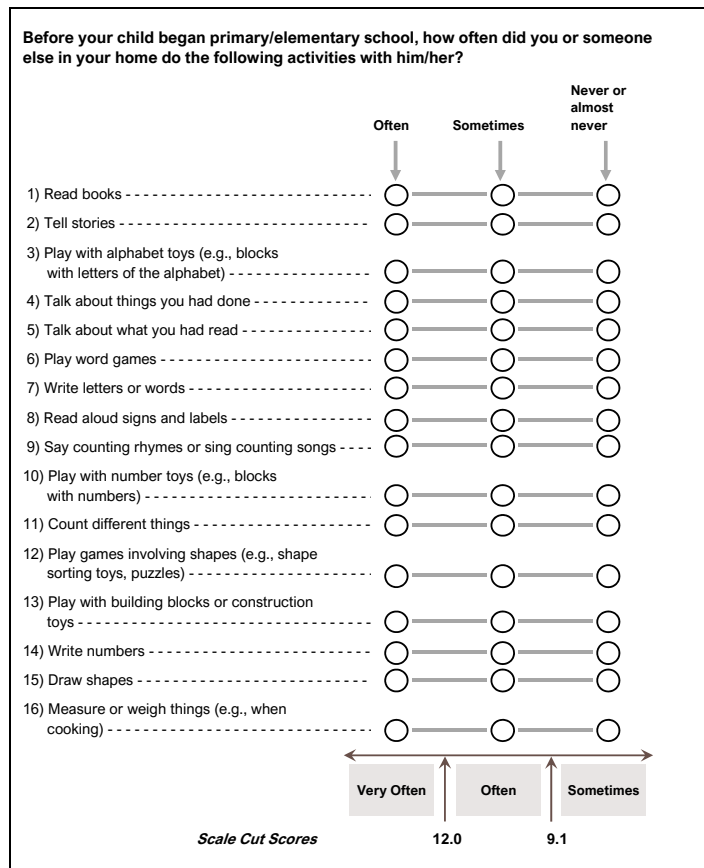
A small majority (53%, on average) of students’ parents “often” engaged them in early literacy and numeracy activities before primary school. Twenty-one percent of students’ parents engaged them in these activities “very often,” and 26 percent of students’ parents “sometimes” engaged them in these activities.

Exhibits 3.2.2 and 3.2.3 show the relationship between engagement in early literacy and numeracy activities and mathematics or science achievement. Students whose parents “very often” engaged them in these activities had the highest average achievement internationally in both mathematics and science (523 and 513, respectively), while students whose parents “sometimes” engaged them in these activities had the lowest average achievement internationally in both subjects (487 in mathematics and 475 in science). Average achievement for students whose parents “often” engaged them in these activities was in between for both subjects (507 in mathematics and 496 in science, internationally).

Exhibit 3.2.1: Home Early Literacy and Numeracy Activities Before Primary School – Parents' Reports

About the Scale

Students were scored according to their parents' reports regarding the frequency they or someone in the home engaged their children in the sixteen activities on the *Early Literacy and Numeracy Activities* scale. Cut scores divide the scale into three categories. Students who **Very Often** engaged in early literacy and numeracy activities before primary school had a score at or above the cut score corresponding to their parents reporting they "often" did twelve of the sixteen activities and "sometimes" did the other four, on average. Students who **Sometimes** engaged in early literacy and numeracy activities before primary school had a score at or below the cut score corresponding to their parents reporting they "never or almost never" did one of the sixteen activities, "sometimes" did twelve of the sixteen activities and "often" did the other three, on average. All other students **Often** engaged in early literacy and numeracy activities.



SOURCE: IEA's Trends in International Mathematics and Science Study - TIMSS 2023
Downloaded from <https://timss2023.org/results>

Exhibit 3.2.2: Home Early Literacy and Numeracy Activities Before Primary School – Parents' Reports

Country		Very Often		Often		Sometimes		Average Scale Score
		Percent of Students	Average Achievement	Percent of Students	Average Achievement	Percent of Students	Average Achievement	
Albania	s	40 (2.6)	526 (8.9)	40 (1.7)	503 (7.0)	20 (2.6)	490 (8.4)	11.4 (0.16)
Armenia		19 (0.9)	523 (4.5)	60 (1.0)	515 (2.9)	21 (0.9)	499 (3.9)	10.5 (0.04)
Azerbaijan		15 (0.7)	518 (6.1)	58 (1.5)	505 (3.3)	28 (1.5)	462 (4.7)	10.1 (0.07)
Bahrain		28 (0.9)	476 (5.5)	53 (0.8)	459 (4.3)	19 (0.6)	452 (5.1)	10.9 (0.04)
Belgium (Flemish)		11 (0.6)	544 (4.2)	50 (1.0)	526 (2.8)	39 (1.0)	517 (2.5)	9.7 (0.03)
Belgium (French)		15 (0.6)	510 (4.0)	55 (0.8)	497 (2.7)	30 (0.8)	479 (3.1)	10.1 (0.03)
Bosnia & Herzegovina	s	30 (1.4)	467 (5.0)	56 (1.3)	453 (3.3)	14 (1.3)	424 (12.3)	11.1 (0.07)
Brazil		9 (0.5)	431 (7.0)	47 (0.9)	409 (3.9)	44 (1.0)	390 (3.2)	9.5 (0.04)
Bulgaria		20 (0.8)	561 (4.2)	51 (1.3)	547 (2.7)	30 (1.5)	484 (6.9)	10.0 (0.10)
Chile	s	23 (0.8)	470 (4.2)	51 (0.9)	446 (3.6)	26 (0.8)	427 (4.5)	10.5 (0.04)
Chinese Taipei		11 (0.5)	630 (3.2)	43 (0.7)	614 (1.9)	46 (0.8)	596 (2.3)	9.6 (0.03)
Cyprus		25 (0.7)	539 (3.1)	52 (0.8)	518 (2.9)	23 (0.7)	501 (3.8)	10.7 (0.04)
Czech Republic	r	22 (0.8)	541 (3.6)	60 (0.8)	537 (2.5)	18 (0.7)	532 (3.2)	10.7 (0.04)
Denmark		12 (0.6)	541 (4.3)	54 (0.8)	527 (2.4)	34 (0.8)	520 (2.7)	9.9 (0.04)
Finland		10 (0.5)	551 (5.1)	56 (0.9)	536 (2.7)	34 (0.9)	527 (3.2)	9.9 (0.03)
France		21 (0.9)	509 (4.1)	57 (1.0)	488 (3.1)	22 (0.9)	466 (4.2)	10.5 (0.04)
Georgia		33 (1.1)	504 (4.4)	52 (1.0)	500 (3.7)	15 (1.0)	483 (5.2)	11.2 (0.06)
Germany	s	15 (0.8)	551 (4.5)	60 (1.1)	537 (2.6)	25 (0.9)	529 (3.6)	10.3 (0.04)
Hong Kong SAR	r	9 (0.5)	629 (6.9)	44 (1.5)	610 (3.8)	47 (1.5)	575 (4.4)	9.5 (0.04)
Hungary	s	25 (1.1)	550 (5.0)	57 (1.4)	537 (3.1)	18 (1.4)	499 (11.9)	10.8 (0.09)
Iran, Islamic Rep. of		9 (0.6)	442 (7.1)	54 (0.9)	427 (4.0)	37 (0.9)	407 (5.3)	9.7 (0.04)
Ireland		33 (1.0)	566 (2.8)	50 (1.1)	548 (3.1)	17 (0.7)	523 (6.5)	11.2 (0.04)
Italy		21 (0.8)	525 (3.6)	60 (0.8)	514 (3.0)	19 (0.7)	507 (3.9)	10.6 (0.03)
Japan		8 (0.4)	614 (4.5)	40 (0.8)	600 (2.7)	53 (1.0)	584 (2.6)	9.2 (0.04)
Jordan		13 (0.7)	455 (6.5)	56 (1.0)	430 (5.1)	31 (1.1)	418 (7.1)	10.0 (0.04)
Kazakhstan		36 (1.0)	500 (3.8)	52 (1.0)	484 (4.2)	13 (0.7)	469 (4.9)	11.3 (0.05)
Korea, Rep. of		34 (0.9)	615 (2.8)	48 (1.0)	592 (3.0)	17 (1.0)	567 (4.3)	11.1 (0.05)
Kosovo	s	31 (1.2)	472 (4.0)	57 (1.2)	458 (4.1)	12 (1.2)	428 (11.3)	11.1 (0.06)
Kuwait		16 (0.7)	404 (6.9)	57 (0.9)	388 (4.7)	26 (0.9)	373 (6.1)	10.3 (0.03)
Latvia	s	24 (1.1)	548 (5.8)	58 (1.1)	540 (3.7)	18 (0.9)	529 (4.9)	10.8 (0.05)
Lithuania	s	25 (0.9)	576 (4.1)	56 (1.0)	565 (3.4)	20 (0.8)	561 (4.4)	10.7 (0.04)
Macao SAR		6 (0.3)	607 (4.8)	44 (0.7)	592 (1.6)	50 (0.7)	571 (1.5)	9.3 (0.02)
Montenegro	r	32 (0.8)	490 (3.3)	54 (0.9)	478 (2.9)	14 (0.5)	461 (4.3)	11.2 (0.03)
Morocco		5 (0.6)	427 (8.6)	36 (1.4)	408 (4.8)	59 (1.6)	383 (6.0)	8.3 (0.12)
North Macedonia		32 (1.0)	493 (4.2)	53 (1.1)	473 (4.0)	15 (1.0)	445 (6.5)	11.1 (0.05)
Norway (5)	s	13 (0.8)	558 (5.4)	54 (0.9)	544 (2.6)	32 (1.0)	533 (4.3)	10.1 (0.04)
Oman		18 (0.6)	448 (7.1)	59 (0.7)	420 (4.3)	23 (0.6)	401 (4.6)	10.4 (0.03)
Poland		30 (1.0)	558 (3.0)	57 (1.0)	544 (2.3)	13 (0.6)	540 (5.1)	11.1 (0.03)
Portugal		17 (0.5)	538 (3.5)	55 (0.8)	523 (3.3)	28 (0.8)	499 (3.3)	10.3 (0.03)
Qatar	s	28 (0.9)	478 (5.6)	49 (0.9)	466 (4.1)	23 (0.9)	444 (4.8)	10.8 (0.06)
Romania	s	31 (1.5)	568 (5.4)	51 (1.4)	553 (4.8)	18 (1.4)	532 (8.9)	11.0 (0.09)
Saudi Arabia	r	27 (0.9)	431 (5.7)	50 (0.7)	424 (4.3)	24 (0.7)	411 (5.3)	10.7 (0.05)
Serbia		30 (1.0)	531 (4.1)	56 (1.0)	526 (3.3)	14 (1.0)	499 (7.7)	11.1 (0.05)
Singapore	r	25 (0.7)	642 (2.9)	43 (0.8)	628 (3.1)	32 (0.8)	615 (3.4)	10.5 (0.04)
Slovak Republic		26 (0.8)	532 (2.9)	55 (1.0)	521 (3.0)	19 (1.2)	476 (8.2)	10.7 (0.09)
Slovenia		22 (0.9)	525 (3.5)	57 (0.8)	518 (2.1)	21 (0.7)	509 (3.3)	10.6 (0.04)
South Africa (5)	r	11 (0.5)	426 (8.7)	48 (0.9)	381 (5.0)	41 (1.1)	339 (4.1)	9.7 (0.05)
Spain		19 (0.6)	519 (2.8)	55 (0.7)	503 (2.2)	25 (0.7)	488 (2.7)	10.4 (0.03)
Sweden	r	11 (0.5)	540 (6.0)	52 (0.8)	538 (3.3)	37 (0.8)	533 (2.6)	9.8 (0.03)
Türkiye (5)		18 (1.1)	592 (5.3)	52 (1.1)	560 (4.3)	30 (1.1)	529 (5.7)	10.2 (0.07)
United Arab Emirates	s	28 (0.4)	527 (2.1)	47 (0.4)	512 (1.8)	25 (0.4)	496 (2.1)	10.8 (0.02)
Uzbekistan		21 (1.0)	458 (4.2)	69 (1.0)	444 (3.3)	10 (0.8)	418 (6.3)	10.9 (0.05)
International Average		21 (0.1)	523 (0.7)	53 (0.1)	507 (0.5)	26 (0.1)	487 (0.8)	
Canada	x	34 (0.8)	538 (3.3)	48 (0.9)	517 (2.8)	18 (0.6)	509 (4.3)	11.2 (0.04)
New Zealand	y	--	--	--	--	--	--	--
Australia		--	--	--	--	--	--	--
England		--	--	--	--	--	--	--
Netherlands		--	--	--	--	--	--	--
United States		--	--	--	--	--	--	--
Benchmarking Participants								
Quebec, Canada	s	25 (1.2)	543 (4.1)	54 (1.2)	519 (3.8)	21 (0.9)	506 (5.5)	10.7 (0.05)
Sharjah, UAE	s	31 (1.4)	531 (4.7)	46 (1.1)	519 (4.4)	23 (0.8)	501 (5.4)	10.9 (0.07)
Abu Dhabi, UAE	x	23 (0.7)	498 (4.4)	48 (0.7)	485 (3.2)	29 (0.8)	468 (3.4)	10.5 (0.04)
Dubai, UAE	x	30 (0.7)	576 (3.3)	48 (0.8)	563 (3.3)	22 (0.8)	553 (3.4)	10.9 (0.04)
Ontario, Canada	y	--	--	--	--	--	--	--

This TIMSS context questionnaire scale was established in 2011 based on the combined response distribution of countries that participated in TIMSS 2011. To provide a point of reference for country comparisons, the scale centerpoint of 10 was located at the mean of the combined distribution. The units of the scale were chosen so that 2 scale score points corresponded to the standard deviation of the distribution.

() Standard errors appear in parentheses. Because of rounding some results may appear inconsistent.

An "r" indicates data are available for at least 70% but less than 85% of the students.

An "s" indicates data are available for at least 50% but less than 70% of the students.

An "x" indicates data are available for at least 40% but less than 50% of the students—interpret with caution.

A "y" indicates data are available for less than 40% of the students.

A dash (-) indicates comparable data not available.

SOURCE: IEA's Trends in International Mathematics and Science Study - TIMSS 2023
Downloaded from <https://timss2023.org/results>

Exhibit 3.2.3: Home Early Literacy and Numeracy Activities Before Primary School – Parents' Reports

Country		Very Often		Often		Sometimes		Average Scale Score
		Percent of Students	Average Achievement	Percent of Students	Average Achievement	Percent of Students	Average Achievement	
Albania	s	40 (2.6)	500 (7.6)	40 (1.7)	485 (5.8)	20 (2.6)	472 (9.0)	11.4 (0.16)
Armenia		19 (0.9)	466 (4.3)	60 (1.0)	458 (2.9)	21 (0.9)	448 (3.2)	10.5 (0.04)
Azerbaijan		15 (0.7)	443 (5.4)	58 (1.5)	431 (3.1)	28 (1.5)	394 (4.7)	10.1 (0.07)
Bahrain		28 (0.9)	496 (5.9)	53 (0.8)	471 (3.9)	19 (0.6)	457 (4.9)	10.9 (0.04)
Belgium (Flemish)		11 (0.6)	511 (3.7)	50 (1.0)	495 (3.1)	39 (1.0)	482 (3.3)	9.7 (0.03)
Belgium (French)		15 (0.6)	504 (3.7)	55 (0.8)	487 (3.0)	30 (0.8)	468 (3.4)	10.1 (0.03)
Bosnia & Herzegovina	s	30 (1.4)	470 (5.7)	56 (1.3)	451 (4.8)	14 (1.3)	416 (14.6)	11.1 (0.07)
Brazil		9 (0.5)	457 (6.4)	47 (0.9)	438 (4.4)	44 (1.0)	412 (3.2)	9.5 (0.04)
Bulgaria		20 (0.8)	563 (5.0)	51 (1.3)	552 (3.5)	30 (1.5)	476 (9.8)	10.0 (0.10)
Chile	s	23 (0.8)	510 (4.6)	51 (0.9)	482 (3.3)	26 (0.8)	462 (3.9)	10.5 (0.04)
Chinese Taipei		11 (0.5)	595 (3.3)	43 (0.7)	580 (2.1)	46 (0.8)	562 (2.2)	9.6 (0.03)
Cyprus		25 (0.7)	510 (3.8)	52 (0.8)	490 (3.4)	23 (0.7)	470 (5.3)	10.7 (0.04)
Czech Republic	r	22 (0.8)	536 (3.6)	60 (0.8)	532 (2.8)	18 (0.7)	528 (3.1)	10.7 (0.04)
Denmark		12 (0.6)	540 (4.2)	54 (0.8)	526 (2.9)	34 (0.8)	521 (3.0)	9.9 (0.04)
Finland		10 (0.5)	558 (4.4)	56 (0.9)	551 (3.1)	34 (0.9)	539 (3.1)	9.9 (0.03)
France		21 (0.9)	512 (4.2)	57 (1.0)	492 (3.2)	22 (0.9)	471 (4.0)	10.5 (0.04)
Georgia		33 (1.1)	469 (3.7)	52 (1.0)	467 (4.2)	15 (1.0)	455 (5.4)	11.2 (0.06)
Germany	s	15 (0.8)	545 (4.6)	60 (1.1)	533 (3.3)	25 (0.9)	522 (4.6)	10.3 (0.04)
Hong Kong SAR	r	9 (0.5)	586 (6.8)	44 (1.5)	558 (3.9)	47 (1.5)	524 (4.6)	9.5 (0.04)
Hungary	s	25 (1.1)	548 (4.2)	57 (1.4)	542 (3.3)	18 (1.4)	506 (12.8)	10.8 (0.09)
Iran, Islamic Rep. of		9 (0.6)	460 (7.7)	54 (0.9)	440 (4.3)	37 (0.9)	417 (5.6)	9.7 (0.04)
Ireland		33 (1.0)	550 (3.6)	50 (1.1)	534 (3.4)	17 (0.7)	510 (6.2)	11.2 (0.04)
Italy		21 (0.8)	525 (3.3)	60 (0.8)	511 (2.6)	19 (0.7)	504 (3.8)	10.6 (0.03)
Japan		8 (0.4)	581 (4.6)	40 (0.8)	564 (2.9)	53 (1.0)	547 (2.7)	9.2 (0.04)
Jordan		13 (0.7)	456 (7.4)	56 (1.0)	423 (4.6)	31 (1.1)	405 (6.7)	10.0 (0.04)
Kazakhstan		36 (1.0)	484 (4.4)	52 (1.0)	462 (3.7)	13 (0.7)	443 (5.1)	11.3 (0.05)
Korea, Rep. of		34 (0.9)	600 (2.7)	48 (1.0)	581 (2.9)	17 (1.0)	562 (4.2)	11.1 (0.05)
Kosovo	s	31 (1.2)	425 (4.5)	57 (1.2)	410 (3.9)	12 (1.2)	382 (10.3)	11.1 (0.06)
Kuwait		16 (0.7)	400 (7.9)	57 (0.9)	380 (5.6)	26 (0.9)	364 (7.4)	10.3 (0.03)
Latvia	s	24 (1.1)	540 (5.4)	58 (1.1)	531 (4.3)	18 (0.9)	526 (5.4)	10.8 (0.05)
Lithuania	s	25 (0.9)	554 (4.0)	56 (1.0)	540 (3.7)	20 (0.8)	534 (4.6)	10.7 (0.04)
Macao SAR		6 (0.3)	564 (5.5)	44 (0.7)	544 (2.0)	50 (0.7)	526 (1.9)	9.3 (0.02)
Montenegro	r	32 (0.8)	472 (3.3)	54 (0.9)	462 (2.9)	14 (0.5)	442 (4.3)	11.2 (0.03)
Morocco		5 (0.6)	435 (10.9)	36 (1.4)	407 (5.9)	59 (1.6)	378 (6.6)	8.3 (0.12)
North Macedonia		32 (1.0)	460 (4.4)	53 (1.1)	438 (4.2)	15 (1.0)	408 (6.9)	11.1 (0.05)
Norway (5)	s	13 (0.8)	562 (4.9)	54 (0.9)	544 (3.4)	32 (1.0)	532 (4.8)	10.1 (0.04)
Oman		18 (0.6)	467 (7.5)	59 (0.7)	432 (4.6)	23 (0.6)	410 (4.7)	10.4 (0.03)
Poland		30 (1.0)	562 (2.7)	57 (1.0)	548 (2.7)	13 (0.6)	544 (4.5)	11.1 (0.03)
Portugal		17 (0.5)	529 (2.9)	55 (0.8)	514 (2.6)	28 (0.8)	495 (3.2)	10.3 (0.03)
Qatar	s	28 (0.9)	495 (5.6)	49 (0.9)	478 (4.4)	23 (0.9)	453 (4.7)	10.8 (0.06)
Romania	s	31 (1.5)	549 (5.3)	51 (1.4)	538 (4.6)	18 (1.4)	524 (8.4)	11.0 (0.09)
Saudi Arabia	r	27 (0.9)	447 (5.4)	50 (0.7)	432 (4.3)	24 (0.7)	415 (5.1)	10.7 (0.05)
Serbia		30 (1.0)	519 (4.0)	56 (1.0)	511 (3.2)	14 (1.0)	488 (6.5)	11.1 (0.05)
Singapore	r	25 (0.7)	638 (2.9)	43 (0.8)	618 (2.8)	32 (0.8)	604 (3.3)	10.5 (0.04)
Slovak Republic		26 (0.8)	542 (3.9)	55 (1.0)	530 (2.8)	19 (1.2)	471 (9.1)	10.7 (0.09)
Slovenia		22 (0.9)	540 (4.0)	57 (0.8)	529 (2.3)	21 (0.7)	518 (3.5)	10.6 (0.04)
South Africa (5)	r	11 (0.5)	395 (12.0)	48 (0.9)	332 (6.8)	41 (1.1)	277 (5.6)	9.7 (0.05)
Spain		19 (0.6)	524 (2.5)	55 (0.7)	509 (2.2)	25 (0.7)	492 (3.1)	10.4 (0.03)
Sweden	r	11 (0.5)	545 (5.9)	52 (0.8)	541 (3.7)	37 (0.8)	538 (2.9)	9.8 (0.03)
Türkiye (5)		18 (1.1)	603 (4.3)	52 (1.1)	576 (3.7)	30 (1.1)	549 (5.0)	10.2 (0.07)
United Arab Emirates	s	28 (0.4)	530 (2.6)	47 (0.4)	513 (2.4)	25 (0.4)	491 (2.6)	10.8 (0.02)
Uzbekistan		21 (1.0)	428 (4.2)	69 (1.0)	412 (3.6)	10 (0.8)	383 (7.9)	10.9 (0.05)
International Average		21 (0.1)	513 (0.7)	53 (0.1)	496 (0.5)	26 (0.1)	475 (0.8)	
Canada	x	34 (0.8)	552 (2.9)	48 (0.9)	529 (2.8)	18 (0.6)	520 (4.6)	11.2 (0.04)
New Zealand	y	--	--	--	--	--	--	--
Australia		--	--	--	--	--	--	--
England		--	--	--	--	--	--	--
Netherlands		--	--	--	--	--	--	--
United States		--	--	--	--	--	--	--
Benchmarking Participants								
Quebec, Canada	s	25 (1.2)	533 (4.9)	54 (1.2)	513 (4.0)	21 (0.9)	501 (5.5)	10.7 (0.05)
Sharjah, UAE	s	31 (1.4)	537 (5.7)	46 (1.1)	522 (4.6)	23 (0.8)	497 (6.5)	10.9 (0.07)
Abu Dhabi, UAE	x	23 (0.7)	492 (5.2)	48 (0.7)	478 (4.5)	29 (0.8)	455 (4.6)	10.5 (0.04)
Dubai, UAE	x	30 (0.7)	585 (3.2)	48 (0.8)	572 (3.0)	22 (0.8)	559 (4.4)	10.9 (0.04)
Ontario, Canada	y	--	--	--	--	--	--	--

This TIMSS context questionnaire scale was established in 2011 based on the combined response distribution of countries that participated in TIMSS 2011. To provide a point of reference for country comparisons, the scale centerpoint of 10 was located at the mean of the combined distribution. The units of the scale were chosen so that 2 scale score points corresponded to the standard deviation of the distribution.

() Standard errors appear in parentheses. Because of rounding some results may appear inconsistent.

An "r" indicates data are available for at least 70% but less than 85% of the students.

An "s" indicates data are available for at least 50% but less than 70% of the students.

An "x" indicates data are available for at least 40% but less than 50% of the students—interpret with caution.

A "y" indicates data are available for less than 40% of the students.

A dash (-) indicates comparable data not available.

SOURCE: IEA's Trends in International Mathematics and Science Study - TIMSS 2023
Downloaded from <https://timss2023.org/results>

Early Literacy and Numeracy Tasks – Parents’ Reports

Students who are able to do basic literacy and numeracy tasks when they begin primary school tend to have higher fourth-grade mathematics and science achievement than those who are not. The TIMSS 2023 *Literacy and Numeracy Tasks* scale (Exhibit 3.2.4) classifies students based on their parents’ reports of how well they could do various literacy and numeracy activities when they began primary school. Students were classified as doing the tasks “very well,” “moderately well,” or “not well.”

On average across countries, 23 percent of students entered school able to do early literacy and numeracy tasks “very well,” 52 percent were able to do the tasks “moderately well,” and 25 percent could do the tasks “not well.” There is considerable variation in these percentages across countries.

Exhibit 3.2.5 shows the relationship between students’ ability to do early literacy and numeracy tasks when beginning primary school and their mathematics achievement. Internationally, students who were able to perform early literacy and numeracy tasks “very well” when beginning primary school had an average mathematics achievement of 536, which is higher than the average mathematics achievement of students who could do the tasks “moderately well” (503) or “not well” (473). A similar pattern is observed for science in Exhibit 3.2.6, where students who could do the tasks “very well” had an average achievement of 520, students who could do the tasks “moderately well” had an average achievement of 492, and students who could do the tasks “not well” had an average achievement of 465.

Exhibit 3.2.4: Could Do Literacy and Numeracy Tasks When Beginning Primary School – Parents' Reports

About the Scale

Students were scored according to their parents' reports regarding how well their children could do the eleven tasks on the *Early Literacy and Numeracy Tasks* scale when they began primary school. Cut scores divide the scale into three categories. Students who could do the tasks **Very Well** had a score at or above the cut score corresponding to their parents reporting the students could do all eleven tasks (five of the tasks at the highest level, four at the second highest level, and simple addition and simple subtraction), on average. Students who could do the tasks **Not Well** had a score at or below the cut score corresponding to their parents reporting the students could do the eleven tasks at a minimal level (five of the tasks at the second lowest level, four at the second highest level, and not simple addition or simple subtraction), on average. All other students could do the literacy and numeracy tasks **Moderately Well** when they began primary school.

How well could your child do the following when he/she began the first grade of primary/elementary school?

	Very well	Moderately well	Not very well	Not at all
1) Recognize the letters of the alphabet -----	☐	☐	☐	☐
2) Read some words -----	☐	☐	☐	☐
3) Read sentences -----	☐	☐	☐	☐
4) Read a story -----	☐	☐	☐	☐
5) Write letters of the alphabet -----	☐	☐	☐	☐
6) Write words other than his/her name -----	☐	☐	☐	☐

Could your child do the following when he/she began the first grade of primary/elementary school?

	Up to 100 or higher	Up to 20	Up to 10	Not at all
1) Count by himself/herself -----	☐	☐	☐	☐
2) Recognize written numbers -----	☐	☐	☐	☐
3) Write numbers -----	☐	☐	☐	☐

Could your child do the following when he/she began the first grade of primary/elementary school?

	Yes	No
1) Do simple addition -----	☐	☐
2) Do simple subtraction -----	☐	☐

Scale Cut Scores

Category	Score
Very Well	11.4
Moderately Well	8.7
Not Well	

SOURCE: IEA's Trends in International Mathematics and Science Study - TIMSS 2023
Downloaded from <https://timss2023.org/results>

Exhibit 3.2.5: Could Do Literacy and Numeracy Tasks When Beginning Primary School – Parents' Reports

Country		Very Well		Moderately Well		Not Well		Average Scale Score
		Percent of Students	Average Achievement	Percent of Students	Average Achievement	Percent of Students	Average Achievement	
Albania	s	35 (2.3)	523 (8.5)	48 (2.6)	510 (7.0)	17 (2.1)	480 (10.7)	10.6 (0.11)
Armenia		14 (0.8)	522 (5.1)	52 (1.1)	514 (3.2)	34 (1.3)	508 (3.4)	9.5 (0.05)
Azerbaijan		21 (0.9)	531 (4.6)	54 (1.0)	497 (3.5)	25 (1.3)	458 (5.1)	9.9 (0.07)
Bahrain		52 (0.9)	480 (4.2)	41 (0.9)	448 (5.0)	7 (0.4)	419 (8.3)	11.5 (0.04)
Belgium (Flemish)		7 (0.5)	534 (7.2)	46 (1.0)	527 (2.8)	47 (1.1)	520 (2.4)	8.9 (0.04)
Belgium (French)		6 (0.5)	523 (5.9)	51 (0.9)	504 (2.7)	43 (0.8)	477 (3.2)	9.1 (0.03)
Bosnia & Herzegovina	s	17 (1.0)	490 (6.2)	55 (1.3)	457 (3.7)	28 (1.3)	425 (6.4)	9.8 (0.06)
Brazil		15 (0.8)	457 (6.9)	47 (0.8)	406 (3.8)	38 (1.2)	376 (4.1)	9.4 (0.06)
Bulgaria		18 (1.0)	577 (5.1)	50 (1.4)	546 (3.0)	33 (1.7)	482 (6.8)	9.5 (0.08)
Chile	s	12 (0.7)	499 (4.8)	51 (1.2)	454 (3.5)	36 (1.2)	416 (4.5)	9.4 (0.05)
Chinese Taipei		26 (0.7)	632 (2.2)	65 (0.8)	602 (1.9)	9 (0.4)	579 (4.1)	10.6 (0.03)
Cyprus		18 (0.6)	555 (3.5)	57 (0.9)	517 (2.6)	24 (0.7)	498 (3.4)	10.0 (0.03)
Czech Republic	r	11 (0.6)	573 (4.7)	53 (0.7)	538 (2.4)	36 (0.9)	524 (2.7)	9.4 (0.04)
Denmark		5 (0.4)	565 (6.0)	51 (0.8)	535 (2.4)	44 (0.9)	512 (2.5)	9.0 (0.02)
Finland		23 (0.8)	581 (3.1)	49 (0.9)	537 (2.5)	28 (0.9)	492 (2.9)	10.0 (0.04)
France		13 (0.6)	517 (4.2)	60 (0.9)	493 (3.3)	27 (0.8)	461 (3.7)	9.7 (0.03)
Georgia		12 (0.6)	522 (5.0)	54 (1.0)	502 (3.5)	33 (1.1)	485 (4.0)	9.4 (0.04)
Germany	s	6 (0.5)	554 (7.1)	45 (1.1)	542 (3.0)	49 (1.1)	530 (2.7)	8.9 (0.03)
Hong Kong SAR	r	36 (1.2)	627 (3.4)	57 (1.1)	584 (3.9)	7 (0.5)	524 (8.4)	11.0 (0.05)
Hungary	s	7 (0.5)	587 (8.2)	30 (1.1)	547 (4.6)	63 (1.3)	522 (4.9)	8.3 (0.07)
Iran, Islamic Rep. of		15 (0.7)	461 (5.1)	57 (0.8)	418 (4.3)	28 (0.9)	406 (5.4)	9.7 (0.04)
Ireland		47 (1.2)	577 (2.8)	47 (1.1)	534 (3.0)	7 (0.6)	469 (8.4)	11.4 (0.05)
Italy		8 (0.5)	539 (7.5)	50 (1.0)	520 (3.3)	42 (1.0)	504 (3.1)	9.1 (0.03)
Japan		24 (0.8)	621 (2.7)	63 (0.8)	591 (2.5)	12 (0.7)	545 (3.3)	10.5 (0.03)
Jordan		32 (0.9)	452 (5.3)	55 (1.0)	424 (6.0)	14 (1.0)	395 (8.5)	10.6 (0.04)
Kazakhstan		27 (1.1)	508 (4.8)	58 (0.8)	484 (3.6)	15 (0.9)	462 (4.7)	10.5 (0.05)
Korea, Rep. of		60 (1.0)	615 (2.5)	36 (0.9)	570 (2.9)	4 (0.4)	523 (8.6)	12.3 (0.04)
Kosovo	s	30 (1.1)	484 (3.7)	56 (1.4)	452 (5.8)	14 (0.9)	432 (7.9)	10.6 (0.05)
Kuwait		23 (0.8)	431 (5.2)	59 (0.9)	384 (4.6)	18 (0.9)	335 (8.3)	10.2 (0.04)
Latvia	s	32 (1.6)	577 (4.2)	58 (1.6)	530 (3.1)	10 (1.1)	479 (6.8)	10.8 (0.06)
Lithuania	s	24 (1.0)	610 (3.7)	62 (1.0)	562 (3.2)	14 (0.9)	518 (4.9)	10.4 (0.04)
Macao SAR		23 (0.5)	616 (2.0)	69 (0.5)	576 (1.2)	7 (0.3)	537 (5.1)	10.6 (0.02)
Montenegro	r	12 (0.5)	509 (4.9)	51 (0.9)	485 (2.6)	37 (0.9)	463 (3.7)	9.4 (0.03)
Morocco		17 (1.0)	439 (5.3)	49 (1.4)	397 (4.9)	34 (1.7)	366 (7.3)	9.4 (0.10)
North Macedonia		20 (0.8)	497 (4.6)	56 (1.0)	476 (3.8)	24 (0.9)	454 (5.1)	10.0 (0.04)
Norway (5)	s	8 (0.5)	587 (5.7)	43 (1.4)	554 (3.3)	49 (1.3)	524 (3.0)	9.0 (0.04)
Oman		48 (0.7)	441 (4.6)	44 (0.7)	408 (4.5)	9 (0.4)	379 (6.0)	11.4 (0.03)
Poland		40 (0.9)	575 (2.3)	52 (0.8)	535 (2.7)	8 (0.5)	489 (5.1)	11.1 (0.03)
Portugal		9 (0.6)	552 (5.9)	53 (1.0)	525 (3.0)	38 (1.0)	502 (3.3)	9.3 (0.04)
Qatar	s	41 (1.1)	484 (4.1)	49 (0.9)	454 (4.2)	10 (0.7)	427 (7.4)	11.1 (0.05)
Romania	s	22 (1.0)	581 (6.4)	52 (1.7)	554 (4.5)	26 (1.8)	536 (7.3)	10.0 (0.07)
Saudi Arabia	r	53 (1.0)	436 (4.7)	42 (0.9)	409 (4.6)	5 (0.4)	403 (7.6)	11.7 (0.04)
Serbia		23 (0.9)	555 (4.9)	58 (1.2)	520 (3.8)	20 (0.9)	496 (5.0)	10.2 (0.04)
Singapore	r	49 (1.0)	653 (2.3)	46 (0.9)	610 (3.0)	5 (0.4)	541 (7.6)	11.5 (0.04)
Slovak Republic		5 (0.4)	565 (6.0)	42 (1.1)	530 (2.9)	53 (1.1)	498 (4.1)	8.6 (0.06)
Slovenia		7 (0.5)	565 (4.0)	41 (1.0)	527 (2.5)	52 (1.0)	504 (2.1)	8.8 (0.04)
South Africa (5)	r	18 (0.6)	420 (5.3)	63 (0.6)	365 (4.3)	18 (0.7)	319 (6.0)	10.1 (0.03)
Spain		27 (0.7)	537 (2.5)	58 (0.9)	496 (2.2)	15 (0.6)	466 (3.2)	10.5 (0.03)
Sweden	r	24 (0.9)	573 (4.1)	58 (1.0)	531 (2.9)	18 (0.8)	505 (3.9)	10.3 (0.04)
Türkiye (5)		27 (0.9)	571 (4.8)	45 (1.1)	553 (5.5)	28 (1.3)	546 (5.9)	10.1 (0.06)
Uzbekistan		36 (1.2)	460 (3.5)	55 (1.2)	437 (3.7)	10 (0.7)	420 (7.2)	10.8 (0.05)
International Average		23 (0.1)	536 (0.7)	52 (0.2)	503 (0.5)	25 (0.1)	473 (0.8)	
Canada	x	28 (0.9)	562 (3.6)	53 (0.9)	515 (2.6)	19 (0.7)	487 (3.3)	10.4 (0.04)
United Arab Emirates	x	49 (0.5)	529 (1.8)	43 (0.5)	500 (2.1)	8 (0.2)	479 (3.6)	11.5 (0.02)
New Zealand	y	--	--	--	--	--	--	--
Australia		--	--	--	--	--	--	--
England		--	--	--	--	--	--	--
Netherlands		--	--	--	--	--	--	--
United States		--	--	--	--	--	--	--
Benchmarking Participants								
Sharjah, UAE	s	53 (1.0)	535 (4.1)	40 (1.0)	501 (4.6)	7 (0.5)	494 (9.5)	11.6 (0.04)
Abu Dhabi, UAE	x	45 (0.8)	502 (3.2)	45 (0.8)	474 (3.1)	9 (0.4)	447 (5.9)	11.3 (0.03)
Dubai, UAE	x	50 (1.1)	582 (2.7)	43 (1.2)	552 (3.5)	7 (0.5)	531 (6.3)	11.5 (0.04)
Quebec, Canada	x	16 (1.1)	564 (4.9)	56 (1.2)	524 (3.7)	28 (1.5)	498 (4.5)	9.8 (0.06)
Ontario, Canada	y	--	--	--	--	--	--	--

This TIMSS context questionnaire scale was established in 2015 based on the combined response distribution of countries that participated in TIMSS 2015. To provide a point of reference for country comparisons, the scale centerpoint of 10 was located at the mean of the combined distribution. The units of the scale were chosen so that 2 scale score points corresponded to the standard deviation of the distribution.

() Standard errors appear in parentheses. Because of rounding some results may appear inconsistent.

An "r" indicates data are available for at least 70% but less than 85% of the students.

An "s" indicates data are available for at least 50% but less than 70% of the students.

An "x" indicates data are available for at least 40% but less than 50% of the students—interpret with caution.

A "y" indicates data are available for less than 40% of the students.

A dash (-) indicates comparable data not available.

SOURCE: IEA's Trends in International Mathematics and Science Study - TIMSS 2023
Downloaded from <https://timss2023.org/results>

Exhibit 3.2.6: Could Do Literacy and Numeracy Tasks When Beginning Primary School – Parents' Reports

Country		Very Well		Moderately Well		Not Well		Average Scale Score
		Percent of Students	Average Achievement	Percent of Students	Average Achievement	Percent of Students	Average Achievement	
Albania	s	35 (2.3)	501 (7.2)	48 (2.6)	489 (6.0)	17 (2.1)	463 (10.0)	10.6 (0.11)
Armenia		14 (0.8)	465 (5.0)	52 (1.1)	458 (3.6)	34 (1.3)	453 (2.9)	9.5 (0.05)
Azerbaijan		21 (0.9)	452 (4.5)	54 (1.0)	424 (3.0)	25 (1.3)	391 (4.9)	9.9 (0.07)
Bahrain		52 (0.9)	499 (4.5)	41 (0.9)	456 (4.4)	7 (0.4)	420 (8.6)	11.5 (0.04)
Belgium (Flemish)		7 (0.5)	481 (7.6)	46 (1.0)	490 (3.0)	47 (1.1)	495 (3.4)	8.9 (0.04)
Belgium (French)		6 (0.5)	505 (5.8)	51 (0.9)	490 (3.1)	43 (0.8)	473 (3.2)	9.1 (0.03)
Bosnia & Herzegovina	s	17 (1.0)	484 (7.2)	55 (1.3)	458 (4.6)	28 (1.3)	422 (9.1)	9.8 (0.06)
Brazil		15 (0.8)	482 (6.3)	47 (0.8)	433 (4.0)	38 (1.2)	401 (4.8)	9.4 (0.06)
Bulgaria		18 (1.0)	577 (5.2)	50 (1.4)	549 (3.8)	33 (1.7)	478 (9.2)	9.5 (0.08)
Chile	s	12 (0.7)	525 (5.9)	51 (1.2)	491 (3.0)	36 (1.2)	457 (4.1)	9.4 (0.05)
Chinese Taipei		26 (0.7)	597 (2.1)	65 (0.8)	568 (2.0)	9 (0.4)	545 (4.9)	10.6 (0.03)
Cyprus		18 (0.6)	524 (4.6)	57 (0.9)	488 (3.5)	24 (0.7)	471 (4.1)	10.0 (0.03)
Czech Republic	r	11 (0.6)	554 (3.7)	53 (0.7)	532 (2.7)	36 (0.9)	526 (2.6)	9.4 (0.04)
Denmark		5 (0.4)	546 (6.6)	51 (0.8)	531 (2.8)	44 (0.9)	519 (2.8)	9.0 (0.02)
Finland		23 (0.8)	582 (3.4)	49 (0.9)	548 (3.2)	28 (0.9)	518 (3.0)	10.0 (0.04)
France		13 (0.6)	512 (4.3)	60 (0.9)	495 (3.1)	27 (0.8)	473 (3.8)	9.7 (0.03)
Georgia		12 (0.6)	483 (5.6)	54 (1.0)	468 (3.5)	33 (1.1)	456 (4.6)	9.4 (0.04)
Germany	s	6 (0.5)	520 (9.1)	45 (1.1)	533 (3.8)	49 (1.1)	532 (3.4)	8.9 (0.03)
Hong Kong SAR	r	36 (1.2)	573 (3.7)	57 (1.1)	534 (3.9)	7 (0.5)	476 (9.3)	11.0 (0.05)
Hungary	s	7 (0.5)	577 (7.0)	30 (1.1)	546 (4.3)	63 (1.3)	528 (5.1)	8.3 (0.07)
Iran, Islamic Rep. of		15 (0.7)	473 (5.3)	57 (0.8)	431 (4.8)	28 (0.9)	418 (5.9)	9.7 (0.04)
Ireland		47 (1.2)	559 (3.2)	47 (1.1)	521 (3.6)	7 (0.6)	466 (9.1)	11.4 (0.05)
Italy		8 (0.5)	527 (6.4)	50 (1.0)	513 (2.6)	42 (1.0)	509 (3.4)	9.1 (0.03)
Japan		24 (0.8)	580 (3.2)	63 (0.8)	555 (2.7)	12 (0.7)	517 (3.4)	10.5 (0.03)
Jordan		32 (0.9)	450 (4.8)	55 (1.0)	415 (5.8)	14 (1.0)	380 (8.7)	10.6 (0.04)
Kazakhstan		27 (1.1)	483 (4.9)	58 (0.8)	463 (3.8)	15 (0.9)	454 (5.2)	10.5 (0.05)
Korea, Rep. of		60 (1.0)	602 (2.5)	36 (0.9)	561 (3.0)	4 (0.4)	533 (11.2)	12.3 (0.04)
Kosovo	s	30 (1.1)	429 (4.3)	56 (1.4)	408 (5.4)	14 (0.9)	388 (8.0)	10.6 (0.05)
Kuwait		23 (0.8)	426 (6.2)	59 (0.9)	376 (5.9)	18 (0.9)	325 (9.3)	10.2 (0.04)
Latvia	s	32 (1.6)	566 (4.0)	58 (1.6)	523 (3.7)	10 (1.1)	478 (10.2)	10.8 (0.06)
Lithuania	s	24 (1.0)	581 (3.8)	62 (1.0)	538 (3.1)	14 (0.9)	498 (5.2)	10.4 (0.04)
Macao SAR		23 (0.5)	570 (2.7)	69 (0.5)	529 (1.6)	7 (0.3)	491 (4.1)	10.6 (0.02)
Montenegro	r	12 (0.5)	487 (5.2)	51 (0.9)	467 (2.5)	37 (0.9)	448 (3.3)	9.4 (0.03)
Morocco		17 (1.0)	443 (5.5)	49 (1.4)	394 (5.8)	34 (1.7)	361 (8.3)	9.4 (0.10)
North Macedonia		20 (0.8)	456 (5.0)	56 (1.0)	441 (4.5)	24 (0.9)	424 (4.9)	10.0 (0.04)
Norway (5)	s	8 (0.5)	578 (5.8)	43 (1.4)	550 (3.6)	49 (1.3)	529 (3.6)	9.0 (0.04)
Oman		48 (0.7)	458 (4.6)	44 (0.7)	419 (4.8)	9 (0.4)	376 (7.6)	11.4 (0.03)
Poland		40 (0.9)	572 (2.3)	52 (0.8)	543 (2.9)	8 (0.5)	501 (6.1)	11.1 (0.03)
Portugal		9 (0.6)	532 (5.4)	53 (1.0)	516 (2.3)	38 (1.0)	500 (2.9)	9.3 (0.04)
Qatar	s	41 (1.1)	500 (4.7)	49 (0.9)	465 (4.3)	10 (0.7)	436 (7.3)	11.1 (0.05)
Romania	s	22 (1.0)	560 (5.7)	52 (1.7)	540 (4.5)	26 (1.8)	524 (7.1)	10.0 (0.07)
Saudi Arabia	r	53 (1.0)	448 (4.5)	42 (0.9)	416 (4.8)	5 (0.4)	397 (6.8)	11.7 (0.04)
Serbia		23 (0.9)	539 (4.5)	58 (1.2)	507 (3.3)	20 (0.9)	487 (5.6)	10.2 (0.04)
Singapore	r	49 (1.0)	644 (2.3)	46 (0.9)	601 (2.8)	5 (0.4)	540 (7.3)	11.5 (0.04)
Slovak Republic		5 (0.4)	563 (6.8)	42 (1.1)	537 (2.9)	53 (1.1)	505 (4.8)	8.6 (0.06)
Slovenia		7 (0.5)	571 (4.6)	41 (1.0)	534 (2.6)	52 (1.0)	520 (2.9)	8.8 (0.04)
South Africa (5)	r	18 (0.6)	376 (7.2)	63 (0.6)	312 (6.1)	18 (0.7)	258 (7.7)	10.1 (0.03)
Spain		27 (0.7)	537 (2.2)	58 (0.9)	502 (2.3)	15 (0.6)	476 (3.7)	10.5 (0.03)
Sweden	r	24 (0.9)	571 (4.4)	58 (1.0)	535 (3.2)	18 (0.8)	516 (4.5)	10.3 (0.04)
Türkiye (5)		27 (0.9)	582 (4.2)	45 (1.1)	571 (4.5)	28 (1.3)	566 (5.2)	10.1 (0.06)
Uzbekistan		36 (1.2)	432 (3.8)	55 (1.2)	404 (3.8)	10 (0.7)	383 (7.7)	10.8 (0.05)
International Average		23 (0.1)	520 (0.7)	52 (0.2)	492 (0.5)	25 (0.1)	465 (0.9)	
Canada	x	28 (0.9)	570 (3.3)	53 (0.9)	529 (2.9)	19 (0.7)	503 (3.6)	10.4 (0.04)
United Arab Emirates	x	49 (0.5)	531 (2.4)	43 (0.5)	499 (2.6)	8 (0.2)	476 (4.1)	11.5 (0.02)
New Zealand	y	--	--	--	--	--	--	--
Australia		--	--	--	--	--	--	--
England		--	--	--	--	--	--	--
Netherlands		--	--	--	--	--	--	--
United States		--	--	--	--	--	--	--
Benchmarking Participants								
Sharjah, UAE	s	53 (1.0)	538 (4.5)	40 (1.0)	504 (5.2)	7 (0.5)	492 (9.7)	11.6 (0.04)
Abu Dhabi, UAE	x	45 (0.8)	495 (4.4)	45 (0.8)	465 (4.3)	9 (0.4)	434 (7.2)	11.3 (0.03)
Dubai, UAE	x	50 (1.1)	591 (3.3)	43 (1.2)	559 (3.7)	7 (0.5)	542 (6.5)	11.5 (0.04)
Quebec, Canada	x	16 (1.1)	542 (5.7)	56 (1.2)	517 (4.2)	28 (1.5)	500 (5.0)	9.8 (0.06)
Ontario, Canada	y	--	--	--	--	--	--	--

This TIMSS context questionnaire scale was established in 2015 based on the combined response distribution of countries that participated in TIMSS 2015. To provide a point of reference for country comparisons, the scale centerpoint of 10 was located at the mean of the combined distribution. The units of the scale were chosen so that 2 scale score points corresponded to the standard deviation of the distribution.

() Standard errors appear in parentheses. Because of rounding some results may appear inconsistent.

An "r" indicates data are available for at least 70% but less than 85% of the students.

An "s" indicates data are available for at least 50% but less than 70% of the students.

An "x" indicates data are available for at least 40% but less than 50% of the students—interpret with caution.

A "y" indicates data are available for less than 40% of the students.

A dash (-) indicates comparable data not available.

SOURCE: IEA's Trends in International Mathematics and Science Study - TIMSS 2023
Downloaded from <https://timss2023.org/results>

Language Spoken at Home

Students Speak the Language of the Test at Home

Familiarity with the language of the TIMSS assessment is positively associated with mathematics and science achievement for fourth- and eighth-grade students; however, exclusively speaking this language does not appear to give students an achievement advantage. Across countries, the language in which the TIMSS assessment is administered is expected to be the language in which students receive mathematics and science instruction. Fourth- and eighth-grade students reported their frequency of speaking this language at home, choosing “always,” “almost always,” “sometimes,” or “never”— see Exhibit 3.3.1.

More than half of fourth-grade students internationally reported “always” speaking the language of the test at home (62%) and a small percentage of students reported “never” speaking the language of the test at home (4%). Sixteen percent of students reported “almost always” speaking the language of the test at home, and 18 percent reported “sometimes” speaking the language of the test at home, on average. Internationally in both subjects (Exhibits 3.3.2 and 3.3.3), there was little difference in average achievement for students who reported “always” and “almost always” speaking the language of the test at home (505 vs. 512 in mathematics and 499 vs. 502 in science). Students who reported “sometimes” speaking the language of the test at home had somewhat lower average achievement compared to these groups (496 in mathematics and 483 in science). The small percentage of students who reported that they “never” speak the language of the test at home had the lowest average achievement in both subjects internationally (461 in mathematics and 441 in science).

Two-thirds of eighth-grade students internationally reported that they “always” speak the language of the test at home (67%). Only 4 percent of students reported that they “never” speak the language of the test at home. Sixteen percent reported that they “almost always” speak the language of the test at home and 13 percent reported that they “sometimes” speak the language of the test at home, on average. There is little difference internationally in average achievement in both subjects (Exhibits 3.3.4 and 3.3.5) between students who reported “always” speaking the language of the test at home and “almost always” speaking the language of the test at home. There is an 8-point difference between these groups in average mathematics achievement and a 6-point difference in average science achievement internationally (474 vs. 482 and 476 vs. 482, respectively). The small percentage of students who reported that they “never” speak the language of the test at home had the lowest average achievement in both subjects (430 in mathematics and 413 in science). Internationally, average achievement for students who reported “sometimes” speaking the language of the test at home was in between (454 for mathematics and 443 for science).

Exhibit 3.3.1: Students Speak the Language of the Test at Home

About the Item	
How often do you speak <language of test> at home?	
Always - - -	☐
Almost always - - -	☐
Sometimes - - -	☐
Never - - -	☐

SOURCE: IEA's Trends in International Mathematics and Science Study - TIMSS 2023
Downloaded from <https://timss2023.org/results>

 IEA TIMSS & PIRLS
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Exhibit 3.3.2: Students Speak the Language of the Test at Home

Country	Always		Almost Always		Sometimes		Never	
	Percent of Students	Average Achievement	Percent of Students	Average Achievement	Percent of Students	Average Achievement	Percent of Students	Average Achievement
Albania	81 (1.0)	511 (5.4)	9 (0.8)	536 (8.3)	9 (0.8)	516 (8.9)	1 ~	~ ~
Armenia	74 (1.2)	510 (2.8)	14 (0.8)	525 (4.3)	11 (0.8)	520 (5.7)	1 ~	~ ~
Australia	64 (1.4)	519 (3.1)	15 (0.7)	545 (3.9)	20 (1.2)	538 (5.6)	1 ~	~ ~
Azerbaijan	67 (0.9)	495 (3.7)	15 (0.5)	492 (4.9)	16 (0.7)	504 (5.3)	2 ~	~ ~
Bahrain	48 (1.0)	454 (4.7)	14 (0.5)	472 (7.2)	31 (0.8)	475 (4.3)	6 (0.4)	438 (8.7)
Belgium (Flemish)	56 (1.3)	534 (2.2)	15 (0.6)	524 (3.5)	25 (1.1)	497 (4.3)	4 (0.4)	508 (9.5)
Belgium (French)	55 (1.2)	497 (2.5)	19 (0.7)	495 (3.8)	23 (1.0)	470 (3.7)	3 (0.3)	467 (7.6)
Bosnia & Herzegovina	77 (1.0)	442 (3.6)	14 (0.8)	474 (4.1)	8 (0.7)	457 (6.6)	1 ~	~ ~
Brazil	80 (0.7)	407 (3.2)	9 (0.4)	387 (9.5)	8 (0.4)	374 (5.4)	2 ~	~ ~
Bulgaria	68 (2.0)	543 (3.8)	13 (0.7)	549 (5.5)	14 (1.2)	496 (8.4)	6 (1.1)	433 (17.1)
Canada	53 (1.1)	497 (2.6)	18 (0.6)	524 (3.5)	25 (0.9)	507 (3.1)	4 (0.4)	513 (9.1)
Chile	82 (0.8)	446 (2.6)	11 (0.6)	452 (4.9)	7 (0.4)	422 (6.4)	1 ~	~ ~
Chinese Taipei	52 (0.9)	605 (2.1)	16 (0.6)	621 (3.4)	32 (0.7)	606 (2.3)	1 ~	~ ~
Cyprus	56 (1.1)	518 (2.7)	15 (0.7)	532 (3.2)	22 (0.9)	510 (4.3)	6 (0.5)	500 (6.3)
Czech Republic	65 (0.7)	530 (2.0)	21 (0.6)	540 (3.3)	13 (0.5)	520 (4.2)	2 ~	~ ~
Denmark	57 (1.0)	529 (2.5)	24 (0.7)	526 (2.9)	17 (0.8)	507 (3.6)	2 ~	~ ~
England	64 (1.8)	549 (2.8)	15 (0.8)	574 (6.0)	19 (1.3)	551 (6.3)	2 ~	~ ~
Finland	68 (1.0)	536 (2.1)	17 (0.7)	532 (3.8)	13 (0.8)	505 (5.3)	3 (0.3)	482 (11.8)
France	64 (1.3)	488 (3.2)	15 (0.7)	498 (3.6)	19 (0.9)	464 (4.7)	2 ~	~ ~
Georgia	73 (1.2)	495 (3.3)	12 (0.7)	515 (5.5)	14 (0.9)	503 (6.6)	1 ~	~ ~
Germany	56 (1.0)	535 (2.3)	19 (0.6)	529 (4.5)	22 (0.8)	505 (3.8)	4 (0.3)	492 (7.7)
Hong Kong SAR	46 (1.3)	596 (3.7)	12 (0.6)	597 (5.7)	40 (1.0)	595 (5.7)	2 ~	~ ~
Hungary	64 (1.1)	517 (4.0)	24 (0.9)	542 (4.3)	12 (0.6)	504 (6.9)	0 ~	~ ~
Iran, Islamic Rep. of	57 (1.7)	426 (4.2)	13 (0.6)	432 (7.1)	17 (0.9)	428 (5.9)	13 (1.2)	391 (8.6)
Ireland	65 (1.4)	553 (3.2)	12 (0.7)	531 (5.2)	18 (0.9)	543 (3.4)	5 (0.6)	501 (9.8)
Italy	68 (1.0)	518 (2.8)	14 (0.7)	516 (5.2)	15 (0.6)	497 (5.1)	3 (0.3)	476 (7.9)
Japan	92 (0.5)	594 (2.4)	6 (0.4)	570 (5.5)	2 ~	~ ~	0 ~	~ ~
Jordan	81 (1.1)	431 (5.6)	9 (0.6)	423 (8.6)	9 (0.7)	416 (8.3)	2 ~	~ ~
Kazakhstan	57 (1.1)	486 (3.7)	23 (0.7)	488 (4.4)	19 (0.8)	495 (5.1)	1 ~	~ ~
Korea, Rep. of	56 (1.1)	590 (2.7)	27 (1.0)	608 (3.2)	17 (0.7)	588 (4.6)	0 ~	~ ~
Kosovo	79 (1.3)	448 (3.3)	9 (0.6)	467 (8.1)	11 (0.9)	466 (6.7)	1 ~	~ ~
Kuwait	51 (1.4)	372 (5.5)	12 (0.8)	375 (7.5)	29 (1.2)	423 (6.3)	8 (0.9)	375 (9.0)
Latvia	53 (1.2)	531 (2.8)	29 (0.9)	547 (3.3)	15 (0.8)	529 (5.2)	3 (0.5)	512 (12.2)
Lithuania	56 (1.0)	560 (3.4)	28 (0.9)	573 (3.7)	14 (0.7)	543 (3.8)	1 ~	~ ~
Macao SAR	54 (0.6)	586 (1.5)	15 (0.5)	596 (2.9)	28 (0.6)	571 (1.9)	2 ~	~ ~
Montenegro	70 (0.8)	475 (2.0)	15 (0.6)	487 (3.6)	9 (0.5)	477 (5.1)	5 (0.4)	486 (5.3)
Morocco	38 (2.1)	389 (6.5)	18 (0.9)	398 (6.1)	17 (1.1)	411 (7.0)	28 (2.0)	393 (9.8)
Netherlands	63 (1.4)	541 (2.0)	16 (0.7)	544 (3.5)	18 (0.8)	522 (3.4)	3 (0.5)	527 (10.4)
New Zealand	61 (1.2)	488 (2.8)	15 (0.7)	508 (4.9)	21 (1.0)	489 (4.2)	3 (0.3)	480 (11.3)
North Macedonia	72 (1.0)	477 (3.7)	11 (0.7)	481 (6.2)	13 (0.6)	463 (5.2)	4 (0.5)	448 (11.6)
Norway (5)	61 (1.1)	536 (2.3)	26 (0.7)	533 (3.5)	11 (0.6)	505 (4.8)	3 (0.3)	509 (7.2)
Oman	55 (1.0)	425 (4.8)	18 (0.7)	408 (4.9)	21 (0.6)	430 (5.3)	7 (0.4)	413 (8.0)
Poland	76 (0.8)	543 (2.2)	18 (0.8)	565 (3.4)	5 (0.4)	531 (7.5)	1 ~	~ ~
Portugal	73 (0.7)	520 (2.9)	13 (0.5)	523 (4.3)	13 (0.6)	497 (4.7)	2 ~	~ ~
Qatar	38 (1.1)	445 (4.7)	13 (0.5)	470 (6.0)	41 (1.1)	484 (3.9)	8 (0.5)	452 (5.3)
Romania	77 (1.6)	542 (5.0)	15 (0.9)	559 (6.7)	7 (0.9)	535 (13.2)	1 ~	~ ~
Saudi Arabia	66 (0.8)	425 (4.1)	12 (0.6)	406 (7.7)	17 (0.6)	423 (6.7)	4 (0.3)	386 (9.1)
Serbia	77 (0.9)	521 (3.3)	15 (0.7)	543 (4.9)	7 (0.5)	508 (8.6)	1 ~	~ ~
Singapore	34 (0.6)	607 (3.1)	23 (0.6)	634 (3.8)	41 (0.6)	612 (3.5)	3 (0.2)	588 (9.0)
Slovak Republic	60 (1.5)	523 (3.2)	21 (0.8)	538 (3.7)	14 (1.1)	489 (6.5)	5 (1.2)	415 (15.4)
Slovenia	66 (0.9)	517 (2.1)	17 (0.6)	521 (3.2)	12 (0.5)	500 (3.7)	5 (0.4)	490 (6.3)
South Africa (5)	20 (1.3)	405 (9.0)	15 (0.7)	357 (6.1)	51 (1.4)	363 (3.9)	13 (0.8)	294 (4.8)
Spain	54 (1.0)	506 (2.4)	14 (0.6)	509 (4.0)	19 (0.6)	487 (3.0)	13 (0.7)	474 (3.0)
Sweden	56 (1.7)	542 (2.4)	21 (1.0)	530 (3.6)	20 (1.6)	500 (6.2)	2 ~	~ ~
Türkiye (5)	73 (1.0)	555 (4.5)	13 (0.6)	571 (5.5)	12 (0.7)	538 (6.8)	2 ~	~ ~
United Arab Emirates	27 (0.4)	501 (1.9)	18 (0.3)	507 (2.3)	45 (0.4)	504 (1.5)	10 (0.2)	458 (3.4)
United States	65 (1.1)	521 (3.4)	11 (0.4)	535 (4.7)	21 (0.9)	503 (4.2)	2 ~	~ ~
Uzbekistan	77 (2.0)	444 (3.3)	12 (0.8)	445 (4.7)	8 (1.1)	451 (8.0)	2 ~	~ ~
International Average	62 (0.2)	505 (0.5)	16 (0.1)	512 (0.7)	18 (0.1)	496 (0.8)	4 (0.1)	461 (1.8)
Benchmarking Participants								
Ontario, Canada	52 (1.5)	496 (3.8)	17 (1.0)	524 (5.4)	27 (1.2)	504 (5.2)	4 (0.7)	511 (21.2)
Quebec, Canada	49 (1.9)	507 (3.4)	20 (0.9)	528 (3.7)	25 (1.6)	517 (4.0)	6 (0.6)	530 (6.4)
Abu Dhabi, UAE	17 (0.4)	473 (3.8)	18 (0.7)	463 (3.9)	49 (0.7)	466 (2.2)	15 (0.4)	424 (4.0)
Dubai, UAE	26 (0.7)	551 (2.6)	20 (0.5)	572 (2.9)	48 (0.7)	557 (2.0)	6 (0.2)	538 (5.1)
Sharjah, UAE	30 (0.7)	496 (5.4)	16 (0.6)	509 (5.3)	46 (1.0)	512 (3.6)	8 (0.4)	487 (8.6)

() Standard errors appear in parentheses. Because of rounding some results may appear inconsistent.
 A tilde (~) indicates insufficient data to report result.

SOURCE: IEA's Trends in International Mathematics and Science Study - TIMSS 2023
 Downloaded from <https://timss2023.org/results>

Exhibit 3.3.3: Students Speak the Language of the Test at Home

Country	Always		Almost Always		Sometimes		Never	
	Percent of Students	Average Achievement	Percent of Students	Average Achievement	Percent of Students	Average Achievement	Percent of Students	Average Achievement
Albania	81 (1.0)	492 (4.7)	9 (0.8)	510 (9.1)	9 (0.8)	501 (8.0)	1 ~	~ ~
Armenia	74 (1.2)	457 (2.8)	14 (0.8)	462 (4.3)	11 (0.8)	456 (5.3)	1 ~	~ ~
Australia	64 (1.4)	550 (3.0)	15 (0.7)	565 (3.6)	20 (1.2)	547 (4.3)	1 ~	~ ~
Azerbaijan	67 (0.9)	423 (3.4)	15 (0.5)	421 (5.2)	16 (0.7)	429 (4.6)	2 ~	~ ~
Bahrain	48 (1.0)	471 (4.6)	14 (0.5)	480 (6.5)	31 (0.8)	487 (4.7)	6 (0.4)	449 (10.1)
Belgium (Flemish)	56 (1.3)	509 (2.6)	15 (0.6)	487 (3.6)	25 (1.1)	454 (4.3)	4 (0.4)	459 (7.4)
Belgium (French)	55 (1.2)	492 (2.6)	19 (0.7)	487 (3.6)	23 (1.0)	455 (4.8)	3 (0.3)	442 (8.2)
Bosnia & Herzegovina	77 (1.0)	443 (4.0)	14 (0.8)	475 (4.5)	8 (0.7)	463 (7.1)	1 ~	~ ~
Brazil	80 (0.7)	437 (3.3)	9 (0.4)	399 (9.7)	8 (0.4)	394 (6.7)	2 ~	~ ~
Bulgaria	68 (2.0)	548 (4.6)	13 (0.7)	552 (5.7)	14 (1.2)	479 (10.9)	6 (1.1)	399 (20.4)
Canada	53 (1.1)	523 (2.6)	18 (0.6)	534 (3.3)	25 (0.9)	514 (3.1)	4 (0.4)	502 (8.7)
Chile	82 (0.8)	482 (2.4)	11 (0.6)	490 (6.4)	7 (0.4)	462 (7.1)	1 ~	~ ~
Chinese Taipei	52 (0.9)	568 (2.0)	16 (0.6)	589 (3.5)	32 (0.7)	575 (2.8)	1 ~	~ ~
Cyprus	56 (1.1)	496 (3.2)	15 (0.7)	501 (4.0)	22 (0.9)	472 (5.4)	6 (0.5)	452 (8.1)
Czech Republic	65 (0.7)	526 (2.2)	21 (0.6)	538 (3.3)	13 (0.5)	512 (3.9)	2 ~	~ ~
Denmark	57 (1.0)	533 (2.8)	24 (0.7)	524 (3.8)	17 (0.8)	492 (4.3)	2 ~	~ ~
England	64 (1.8)	558 (2.8)	15 (0.8)	571 (5.0)	19 (1.3)	545 (5.3)	2 ~	~ ~
Finland	68 (1.0)	554 (2.3)	17 (0.7)	550 (3.8)	13 (0.8)	493 (6.0)	3 (0.3)	447 (11.3)
France	64 (1.3)	495 (2.8)	15 (0.7)	495 (4.9)	19 (0.9)	466 (5.0)	2 ~	~ ~
Georgia	73 (1.2)	464 (3.5)	12 (0.7)	475 (5.2)	14 (0.9)	468 (7.5)	1 ~	~ ~
Germany	56 (1.0)	535 (2.9)	19 (0.6)	523 (5.2)	22 (0.8)	480 (4.6)	4 (0.3)	450 (9.0)
Hong Kong SAR	46 (1.3)	546 (4.0)	12 (0.6)	548 (5.7)	40 (1.0)	547 (5.4)	2 ~	~ ~
Hungary	64 (1.1)	521 (3.7)	24 (0.9)	545 (3.9)	12 (0.6)	509 (5.7)	0 ~	~ ~
Iran, Islamic Rep. of	57 (1.7)	443 (4.5)	13 (0.6)	447 (7.7)	17 (0.9)	440 (6.6)	13 (1.2)	392 (8.6)
Ireland	65 (1.4)	540 (3.3)	12 (0.7)	524 (5.3)	18 (0.9)	525 (4.1)	5 (0.6)	480 (10.3)
Italy	68 (1.0)	516 (2.5)	14 (0.7)	518 (4.6)	15 (0.6)	491 (3.6)	3 (0.3)	461 (7.8)
Japan	92 (0.5)	558 (2.5)	6 (0.4)	537 (5.1)	2 ~	~ ~	0 ~	~ ~
Jordan	81 (1.1)	423 (5.1)	9 (0.6)	399 (9.8)	9 (0.7)	410 (8.1)	2 ~	~ ~
Kazakhstan	57 (1.1)	473 (3.6)	23 (0.7)	460 (4.3)	19 (0.8)	460 (4.9)	1 ~	~ ~
Korea, Rep. of	56 (1.1)	579 (2.5)	27 (1.0)	596 (3.3)	17 (0.7)	577 (4.8)	0 ~	~ ~
Kosovo	79 (1.3)	399 (3.5)	9 (0.6)	420 (8.1)	11 (0.9)	423 (7.6)	1 ~	~ ~
Kuwait	51 (1.4)	361 (6.1)	12 (0.8)	369 (8.3)	29 (1.2)	417 (8.5)	8 (0.9)	385 (10.0)
Latvia	53 (1.2)	527 (2.7)	29 (0.9)	540 (3.2)	15 (0.8)	508 (6.1)	3 (0.5)	472 (14.1)
Lithuania	56 (1.0)	539 (3.2)	28 (0.9)	546 (3.7)	14 (0.7)	518 (3.9)	1 ~	~ ~
Macao SAR	54 (0.6)	541 (1.7)	15 (0.5)	552 (2.9)	28 (0.6)	524 (2.7)	2 ~	~ ~
Montenegro	70 (0.8)	459 (2.1)	15 (0.6)	473 (4.1)	9 (0.5)	457 (5.2)	5 (0.4)	467 (5.5)
Morocco	38 (2.1)	387 (7.5)	18 (0.9)	401 (6.6)	17 (1.1)	409 (7.5)	28 (2.0)	387 (10.4)
Netherlands	63 (1.4)	525 (2.9)	16 (0.7)	521 (4.8)	18 (0.8)	493 (4.7)	3 (0.5)	487 (11.1)
New Zealand	61 (1.2)	518 (2.9)	15 (0.7)	531 (5.5)	21 (1.0)	511 (4.3)	3 (0.3)	489 (12.0)
North Macedonia	72 (1.0)	442 (3.8)	11 (0.7)	451 (7.1)	13 (0.6)	428 (5.3)	4 (0.5)	414 (13.4)
Norway (5)	61 (1.1)	540 (2.6)	26 (0.7)	533 (4.6)	11 (0.6)	489 (5.6)	3 (0.3)	505 (7.7)
Oman	55 (1.0)	438 (4.8)	18 (0.7)	422 (5.1)	21 (0.6)	441 (5.6)	7 (0.4)	417 (7.7)
Poland	76 (0.8)	549 (2.5)	18 (0.8)	563 (3.3)	5 (0.4)	529 (7.7)	1 ~	~ ~
Portugal	73 (0.7)	513 (2.5)	13 (0.5)	518 (3.5)	13 (0.6)	495 (4.6)	2 ~	~ ~
Qatar	38 (1.1)	458 (4.9)	13 (0.5)	476 (6.8)	41 (1.1)	491 (4.2)	8 (0.5)	448 (5.9)
Romania	77 (1.6)	529 (4.5)	15 (0.9)	536 (8.2)	7 (0.9)	515 (15.4)	1 ~	~ ~
Saudi Arabia	66 (0.8)	437 (3.9)	12 (0.6)	402 (8.4)	17 (0.6)	430 (6.7)	4 (0.3)	383 (10.2)
Serbia	77 (0.9)	509 (3.1)	15 (0.7)	526 (5.4)	7 (0.5)	499 (8.7)	1 ~	~ ~
Singapore	34 (0.6)	602 (3.4)	23 (0.6)	626 (3.0)	41 (0.6)	604 (3.6)	3 (0.2)	575 (9.1)
Slovak Republic	60 (1.5)	530 (3.2)	21 (0.8)	551 (3.7)	14 (1.1)	486 (8.7)	5 (1.2)	398 (17.0)
Slovenia	66 (0.9)	533 (2.4)	17 (0.6)	533 (3.6)	12 (0.5)	499 (4.7)	5 (0.4)	472 (5.7)
South Africa (5)	20 (1.3)	376 (11.8)	15 (0.7)	302 (9.0)	51 (1.4)	304 (5.4)	13 (0.8)	214 (6.8)
Spain	54 (1.0)	512 (2.1)	14 (0.6)	513 (4.1)	19 (0.6)	495 (3.0)	13 (0.7)	479 (3.2)
Sweden	56 (1.7)	549 (2.5)	21 (1.0)	534 (4.1)	20 (1.6)	492 (6.8)	2 ~	~ ~
Türkiye (5)	73 (1.0)	572 (3.6)	13 (0.6)	584 (4.9)	12 (0.7)	557 (6.3)	2 ~	~ ~
United Arab Emirates	27 (0.4)	502 (2.6)	18 (0.3)	507 (2.9)	45 (0.4)	502 (2.0)	10 (0.2)	436 (3.5)
United States	65 (1.1)	539 (3.0)	11 (0.4)	547 (5.2)	21 (0.9)	513 (3.9)	2 ~	~ ~
Uzbekistan	77 (2.0)	416 (3.6)	12 (0.8)	409 (5.8)	8 (1.1)	404 (9.3)	2 ~	~ ~
International Average	62 (0.2)	499 (0.5)	16 (0.1)	502 (0.7)	18 (0.1)	483 (0.8)	4 (0.1)	441 (1.9)
Benchmarking Participants								
Ontario, Canada	52 (1.5)	527 (3.7)	17 (1.0)	540 (5.1)	27 (1.2)	519 (5.0)	4 (0.7)	513 (18.8)
Quebec, Canada	49 (1.9)	509 (3.4)	20 (0.9)	518 (3.6)	25 (1.6)	500 (4.1)	6 (0.6)	500 (7.4)
Abu Dhabi, UAE	17 (0.4)	469 (4.5)	18 (0.7)	453 (5.0)	49 (0.7)	456 (2.8)	15 (0.4)	393 (4.4)
Dubai, UAE	26 (0.7)	559 (3.1)	20 (0.5)	582 (3.1)	48 (0.7)	563 (2.2)	6 (0.2)	530 (5.8)
Sharjah, UAE	30 (0.7)	495 (6.5)	16 (0.6)	513 (6.2)	46 (1.0)	512 (3.8)	8 (0.4)	473 (7.6)

() Standard errors appear in parentheses. Because of rounding some results may appear inconsistent.
A tilde (~) indicates insufficient data to report result.

SOURCE: IEA's Trends in International Mathematics and Science Study - TIMSS 2023
Downloaded from <https://timss2023.org/results>

Exhibit 3.3.4: Students Speak the Language of the Test at Home

Country	Always		Almost Always		Sometimes		Never	
	Percent of Students	Average Achievement	Percent of Students	Average Achievement	Percent of Students	Average Achievement	Percent of Students	Average Achievement
Australia	72 (1.4)	507 (3.5)	18 (0.9)	516 (5.4)	9 (0.7)	525 (10.0)	2 ~	~ ~
Austria	65 (1.1)	524 (2.3)	17 (0.7)	503 (3.5)	14 (0.7)	480 (5.0)	4 (0.5)	480 (10.9)
Azerbaijan	74 (1.2)	478 (4.0)	16 (0.6)	494 (5.2)	8 (0.8)	465 (8.5)	2 ~	~ ~
Bahrain	56 (0.9)	413 (3.1)	19 (0.6)	449 (4.5)	20 (0.6)	454 (4.3)	4 (0.4)	416 (9.6)
Brazil	88 (0.5)	382 (2.7)	7 (0.4)	383 (6.3)	4 (0.2)	314 (4.8)	1 ~	~ ~
Chile	88 (0.6)	417 (3.1)	10 (0.5)	434 (6.1)	1 ~	~ ~	1 ~	~ ~
Chinese Taipei	71 (0.8)	606 (3.4)	24 (0.7)	605 (3.9)	4 (0.3)	550 (7.7)	1 ~	~ ~
Cote d'Ivoire	50 (1.6)	273 (7.3)	21 (0.7)	266 (5.6)	27 (1.4)	246 (2.7)	2 ~	~ ~
Cyprus	59 (0.9)	489 (2.3)	17 (0.7)	496 (4.6)	16 (0.7)	513 (7.1)	8 (0.4)	500 (8.7)
Czech Republic	72 (0.7)	519 (2.3)	22 (0.6)	520 (3.1)	4 (0.3)	494 (6.8)	2 ~	~ ~
England	71 (2.0)	526 (4.8)	16 (1.1)	528 (7.4)	11 (1.0)	521 (8.7)	2 ~	~ ~
Finland	82 (0.9)	508 (2.6)	11 (0.5)	503 (4.7)	5 (0.5)	467 (9.4)	2 ~	~ ~
France	70 (1.4)	487 (3.5)	20 (1.0)	473 (3.6)	8 (0.7)	433 (5.6)	1 ~	~ ~
Georgia	81 (1.2)	467 (3.2)	13 (0.7)	475 (5.2)	5 (0.8)	452 (15.1)	1 ~	~ ~
Hong Kong SAR	48 (2.2)	568 (6.1)	14 (0.7)	592 (9.1)	32 (1.6)	580 (5.9)	7 (0.7)	589 (9.3)
Hungary	81 (0.8)	505 (3.8)	16 (0.7)	517 (5.0)	2 ~	~ ~	1 ~	~ ~
Iran, Islamic Rep. of	51 (1.8)	434 (3.8)	20 (0.9)	445 (4.6)	18 (1.4)	395 (5.3)	11 (0.9)	387 (8.5)
Ireland	78 (1.2)	524 (2.5)	9 (0.6)	518 (6.0)	8 (0.6)	523 (7.8)	5 (0.3)	513 (7.2)
Israel	78 (0.9)	486 (4.0)	14 (0.6)	503 (6.0)	6 (0.5)	480 (7.7)	2 ~	~ ~
Italy	72 (1.3)	510 (2.8)	18 (0.9)	485 (4.2)	8 (0.7)	457 (8.8)	2 ~	~ ~
Japan	95 (0.4)	597 (3.1)	3 (0.3)	589 (8.3)	1 ~	~ ~	0 ~	~ ~
Jordan	79 (0.7)	392 (3.3)	11 (0.6)	396 (4.5)	7 (0.4)	368 (5.7)	3 (0.3)	332 (9.1)
Kazakhstan	70 (1.2)	454 (3.4)	21 (0.7)	465 (5.5)	9 (0.7)	438 (7.8)	1 ~	~ ~
Korea, Rep. of	90 (0.4)	597 (3.1)	9 (0.4)	598 (6.1)	1 ~	~ ~	0 ~	~ ~
Kuwait	64 (1.2)	383 (5.3)	17 (0.8)	435 (8.5)	15 (0.7)	437 (8.3)	5 (0.7)	378 (11.2)
Lithuania	71 (0.9)	516 (3.6)	24 (0.8)	516 (3.3)	4 (0.4)	482 (7.8)	2 ~	~ ~
Malaysia	63 (1.8)	404 (3.5)	12 (0.5)	420 (6.0)	18 (1.2)	431 (6.2)	6 (0.6)	400 (6.5)
Malta	15 (0.5)	503 (4.0)	21 (0.6)	514 (3.0)	47 (0.7)	499 (1.8)	18 (0.5)	485 (3.8)
Morocco	18 (1.2)	358 (4.3)	16 (0.6)	385 (4.6)	44 (1.0)	384 (3.3)	22 (1.1)	377 (3.7)
Norway (9)	74 (1.0)	508 (2.3)	14 (0.7)	493 (3.8)	8 (0.5)	479 (5.0)	4 (0.3)	468 (7.0)
Oman	54 (1.0)	411 (2.8)	22 (0.6)	421 (3.8)	18 (0.7)	418 (4.9)	6 (0.3)	382 (6.1)
Palestinian Nat'l Auth.	82 (0.8)	385 (3.0)	8 (0.5)	397 (6.4)	6 (0.5)	354 (9.2)	4 (0.3)	336 (9.7)
Portugal	86 (0.6)	476 (2.7)	10 (0.4)	484 (4.0)	3 (0.3)	453 (8.1)	1 ~	~ ~
Qatar	47 (1.6)	428 (5.2)	23 (0.8)	479 (5.5)	25 (1.7)	479 (6.0)	5 (0.5)	444 (12.2)
Romania	85 (0.9)	501 (4.6)	11 (0.6)	503 (8.1)	3 (0.4)	438 (21.0)	1 ~	~ ~
Saudi Arabia	79 (0.7)	397 (3.4)	12 (0.5)	414 (5.0)	7 (0.4)	400 (7.5)	3 (0.3)	349 (10.3)
Singapore	51 (1.0)	607 (6.0)	32 (0.8)	604 (6.8)	15 (0.7)	605 (8.4)	2 ~	~ ~
South Africa (9)	13 (0.8)	438 (8.7)	17 (0.6)	420 (4.5)	65 (1.0)	383 (2.9)	6 (0.3)	371 (5.5)
Sweden	70 (1.3)	528 (2.7)	16 (0.7)	507 (3.8)	10 (0.7)	481 (6.0)	4 (0.4)	504 (7.6)
Türkiye	82 (0.9)	510 (4.3)	12 (0.7)	527 (6.9)	5 (0.7)	457 (13.1)	1 ~	~ ~
United Arab Emirates	32 (0.5)	478 (2.5)	27 (0.5)	514 (2.4)	34 (0.5)	488 (2.1)	7 (0.2)	464 (3.1)
United States	67 (1.7)	492 (3.8)	19 (1.0)	498 (7.3)	12 (0.8)	468 (8.7)	2 ~	~ ~
Uzbekistan	81 (1.6)	419 (4.3)	12 (0.9)	442 (7.8)	6 (0.9)	410 (7.6)	1 ~	~ ~
International Average	67 (0.2)	474 (0.6)	16 (0.1)	482 (0.9)	13 (0.1)	454 (1.3)	4 (0.1)	430 (1.9)
Benchmarking Participants								
Abu Dhabi, UAE	19 (0.4)	467 (3.3)	26 (0.8)	475 (3.8)	43 (0.8)	448 (3.1)	11 (0.4)	427 (3.7)
Dubai, UAE	31 (1.3)	530 (5.2)	32 (0.9)	561 (3.3)	31 (1.2)	548 (3.2)	6 (0.3)	538 (7.0)
Sharjah, UAE	36 (1.1)	473 (5.9)	27 (0.9)	518 (6.6)	32 (1.1)	505 (5.1)	5 (0.4)	488 (7.2)

() Standard errors appear in parentheses. Because of rounding some results may appear inconsistent.
 A tilde (~) indicates insufficient data to report result.

SOURCE: IEA's Trends in International Mathematics and Science Study - TIMSS 2023
 Downloaded from <https://timss2023.org/results>

Exhibit 3.3.5: Students Speak the Language of the Test at Home

Country	Always		Almost Always		Sometimes		Never	
	Percent of Students	Average Achievement	Percent of Students	Average Achievement	Percent of Students	Average Achievement	Percent of Students	Average Achievement
Australia	72 (1.4)	524 (3.5)	18 (0.9)	524 (4.8)	9 (0.7)	510 (8.4)	2 ~	~ ~
Austria	65 (1.1)	528 (2.4)	17 (0.7)	503 (3.7)	14 (0.7)	462 (5.2)	4 (0.5)	466 (10.9)
Azerbaijan	74 (1.2)	409 (3.2)	16 (0.6)	432 (4.6)	8 (0.8)	396 (7.1)	2 ~	~ ~
Bahrain	56 (0.9)	440 (3.5)	19 (0.6)	479 (4.8)	20 (0.6)	476 (4.9)	4 (0.4)	424 (8.8)
Brazil	88 (0.5)	425 (2.4)	7 (0.4)	427 (6.1)	4 (0.2)	335 (5.3)	1 ~	~ ~
Chile	88 (0.6)	456 (2.5)	10 (0.5)	471 (5.6)	1 ~	~ ~	1 ~	~ ~
Chinese Taipei	71 (0.8)	574 (2.6)	24 (0.7)	579 (3.5)	4 (0.3)	517 (7.8)	1 ~	~ ~
Cote d'Ivoire	50 (1.6)	215 (10.8)	21 (0.7)	179 (9.0)	27 (1.4)	134 (3.6)	2 ~	~ ~
Cyprus	59 (0.9)	464 (2.6)	17 (0.7)	468 (5.2)	16 (0.7)	473 (7.1)	8 (0.4)	460 (9.8)
Czech Republic	72 (0.7)	529 (2.0)	22 (0.6)	533 (2.8)	4 (0.3)	487 (7.1)	2 ~	~ ~
England	71 (2.0)	535 (4.5)	16 (1.1)	532 (7.2)	11 (1.0)	517 (8.8)	2 ~	~ ~
Finland	82 (0.9)	538 (3.0)	11 (0.5)	528 (4.6)	5 (0.5)	465 (10.5)	2 ~	~ ~
France	70 (1.4)	496 (3.6)	20 (1.0)	479 (3.3)	8 (0.7)	434 (5.9)	1 ~	~ ~
Georgia	81 (1.2)	449 (3.0)	13 (0.7)	454 (4.9)	5 (0.8)	430 (18.2)	1 ~	~ ~
Hong Kong SAR	48 (2.2)	533 (2.8)	14 (0.7)	552 (9.9)	32 (1.6)	521 (5.5)	7 (0.7)	497 (9.3)
Hungary	81 (0.8)	521 (3.4)	16 (0.7)	532 (4.4)	2 ~	~ ~	1 ~	~ ~
Iran, Islamic Rep. of	51 (1.8)	431 (3.5)	20 (0.9)	443 (4.5)	18 (1.4)	389 (5.4)	11 (0.9)	375 (8.5)
Ireland	78 (1.2)	528 (3.5)	9 (0.6)	519 (8.2)	8 (0.6)	533 (7.7)	5 (0.3)	509 (8.5)
Israel	78 (0.9)	481 (3.8)	14 (0.6)	499 (5.4)	6 (0.5)	463 (7.3)	2 ~	~ ~
Italy	72 (1.3)	512 (2.8)	18 (0.9)	483 (4.6)	8 (0.7)	451 (9.3)	2 ~	~ ~
Japan	95 (0.4)	559 (3.1)	3 (0.3)	559 (7.7)	1 ~	~ ~	0 ~	~ ~
Jordan	79 (0.7)	418 (3.9)	11 (0.6)	422 (5.5)	7 (0.4)	385 (6.0)	3 (0.3)	334 (9.0)
Kazakhstan	70 (1.2)	444 (3.1)	21 (0.7)	453 (4.3)	9 (0.7)	416 (6.4)	1 ~	~ ~
Korea, Rep. of	90 (0.4)	546 (2.2)	9 (0.4)	547 (5.8)	1 ~	~ ~	0 ~	~ ~
Kuwait	64 (1.2)	405 (5.7)	17 (0.8)	466 (8.6)	15 (0.7)	449 (10.6)	5 (0.7)	392 (10.3)
Lithuania	71 (0.9)	522 (3.4)	24 (0.8)	521 (3.1)	4 (0.4)	485 (7.8)	2 ~	~ ~
Malaysia	63 (1.8)	434 (3.7)	12 (0.5)	438 (6.2)	18 (1.2)	415 (6.4)	6 (0.6)	353 (6.7)
Malta	15 (0.5)	514 (4.4)	21 (0.6)	530 (3.9)	47 (0.7)	496 (2.3)	18 (0.5)	474 (4.0)
Morocco	18 (1.2)	329 (5.2)	16 (0.6)	338 (5.1)	44 (1.0)	330 (3.6)	22 (1.1)	312 (4.8)
Norway (9)	74 (1.0)	498 (2.6)	14 (0.7)	478 (4.3)	8 (0.5)	456 (5.3)	4 (0.3)	448 (9.1)
Oman	54 (1.0)	460 (2.8)	22 (0.6)	467 (4.4)	18 (0.7)	456 (4.1)	6 (0.3)	418 (6.8)
Palestinian Nat'l Auth.	82 (0.8)	397 (2.8)	8 (0.5)	412 (6.0)	6 (0.5)	354 (9.6)	4 (0.3)	334 (8.8)
Portugal	86 (0.6)	506 (2.4)	10 (0.4)	518 (4.5)	3 (0.3)	482 (7.0)	1 ~	~ ~
Qatar	47 (1.6)	465 (5.0)	23 (0.8)	510 (5.7)	25 (1.7)	499 (6.1)	5 (0.5)	449 (13.0)
Romania	85 (0.9)	470 (3.8)	11 (0.6)	482 (6.1)	3 (0.4)	420 (17.0)	1 ~	~ ~
Saudi Arabia	79 (0.7)	419 (3.5)	12 (0.5)	446 (5.6)	7 (0.4)	416 (8.6)	3 (0.3)	357 (9.8)
Singapore	51 (1.0)	609 (5.5)	32 (0.8)	610 (6.1)	15 (0.7)	598 (8.7)	2 ~	~ ~
South Africa (9)	13 (0.8)	439 (10.3)	17 (0.6)	407 (5.6)	65 (1.0)	338 (3.6)	6 (0.3)	318 (6.9)
Sweden	70 (1.3)	537 (3.0)	16 (0.7)	510 (4.6)	10 (0.7)	459 (6.2)	4 (0.4)	487 (10.1)
Türkiye	82 (0.9)	531 (3.6)	12 (0.7)	544 (5.8)	5 (0.7)	482 (12.2)	1 ~	~ ~
United Arab Emirates	32 (0.5)	482 (2.6)	27 (0.5)	520 (2.5)	34 (0.5)	479 (2.5)	7 (0.2)	439 (3.9)
United States	67 (1.7)	520 (3.5)	19 (1.0)	522 (6.3)	12 (0.8)	486 (8.6)	2 ~	~ ~
Uzbekistan	81 (1.6)	394 (3.7)	12 (0.9)	421 (5.7)	6 (0.9)	380 (7.1)	1 ~	~ ~
International Average	67 (0.2)	476 (0.6)	16 (0.1)	482 (0.9)	13 (0.1)	443 (1.3)	4 (0.1)	413 (2.0)
Benchmarking Participants								
Abu Dhabi, UAE	19 (0.4)	468 (4.1)	26 (0.8)	478 (4.7)	43 (0.8)	432 (4.1)	11 (0.4)	395 (5.4)
Dubai, UAE	31 (1.3)	535 (5.7)	32 (0.9)	568 (3.1)	31 (1.2)	545 (3.9)	6 (0.3)	520 (7.5)
Sharjah, UAE	36 (1.1)	478 (5.6)	27 (0.9)	527 (6.8)	32 (1.1)	505 (5.4)	5 (0.4)	472 (7.4)

() Standard errors appear in parentheses. Because of rounding some results may appear inconsistent.
 A tilde (~) indicates insufficient data to report result.

SOURCE: IEA's Trends in International Mathematics and Science Study - TIMSS 2023
 Downloaded from <https://timss2023.org/results>

School Environment

School Composition

School Composition by Socioeconomic Background of the Student Body – Principals’ Reports

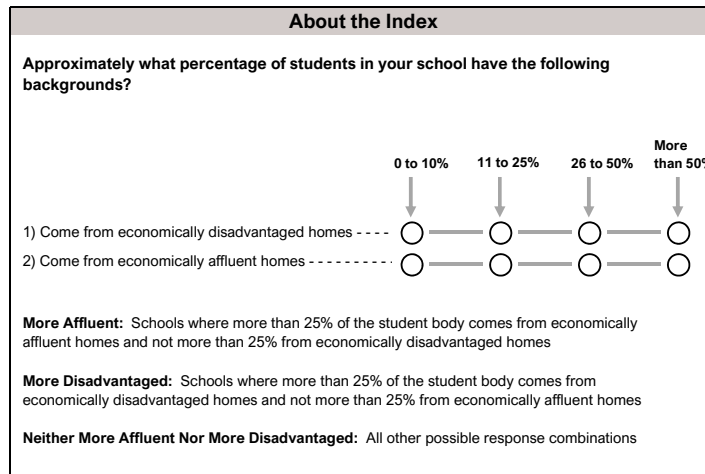
Principals’ reports of schools’ socioeconomic composition have a clear relationship with students’ mathematics and science achievement in the fourth and eighth grades. Students in schools with a higher proportion of students from economically affluent backgrounds have greater average achievement in both grades and subjects than students in schools with lower proportions of economically affluent students. The TIMSS 2023 index for school socioeconomic composition defines “more affluent” schools as having more than 25 percent of students from economically affluent homes and not more than 25 percent from economically disadvantaged homes, while “more disadvantaged” schools have more than 25 percent of students from disadvantaged homes and not more than 25 percent from affluent homes (Exhibit 4.1.1). All other combinations are considered to be “neither more affluent nor more disadvantaged.”

On average, 42 percent of fourth-grade students attended “more affluent” schools and 23 percent of fourth-grade students attended “more disadvantaged” schools. The remaining 35 percent of students attended schools that were “neither more affluent nor more disadvantaged.” Exhibits 4.1.2 and 4.1.3 show the relationship between school socioeconomic composition and mathematics or science achievement for fourth-grade students. Students in “more affluent” schools have higher achievement in both grades and subjects than students in “neither more affluent nor more disadvantaged” and “more disadvantaged schools.” Internationally, fourth-grade students in “more affluent” schools had an average mathematics achievement of 522. Those in “more disadvantaged” schools had an average mathematics achievement of 479, and those in “neither more affluent nor more disadvantaged” schools had an average mathematics achievement of 502. A similar pattern is observed in fourth-grade science, where average achievement was 514 for students in “more affluent” schools, 468 for students in “more disadvantaged” schools, and 494 for students in “neither more affluent nor more disadvantaged” schools.

Thirty-six percent of eighth-grade students internationally attended “more affluent” schools, 30 percent attended “more disadvantaged” schools, and 34 percent attended schools that were “neither more affluent nor more disadvantaged.” Exhibits 4.1.4 and 4.1.5 show the relationship between principals’ reports of school composition and average achievement for eighth-grade students. Eighth-grade students in “more affluent” schools had the highest average achievement (498 in mathematics and 495 in science) and students in “more disadvantaged” schools had the lowest average

achievement (449 in mathematics and 448 in science). Students in schools that were “neither more affluent nor more disadvantaged” had an average achievement between students in the other school composition categories (475 in mathematics and 474 in science).

Exhibit 4.1.1: School Composition by Socioeconomic Background of the Student Body – Principals’ Reports



SOURCE: IEA's Trends in International Mathematics and Science Study - TIMSS 2023
Downloaded from <https://timss2023.org/results>

Exhibit 4.1.2: School Composition by Socioeconomic Background of the Student Body – Principals' Reports

Country		More Affluent		Neither More Affluent Nor More Disadvantaged		More Disadvantaged	
		Percent of Students	Average Achievement	Percent of Students	Average Achievement	Percent of Students	Average Achievement
Albania	s	18 (5.0)	541 (8.4)	33 (6.5)	517 (6.4)	50 (6.2)	489 (9.9)
Armenia		65 (4.5)	513 (4.0)	21 (3.5)	512 (6.6)	14 (3.1)	511 (7.9)
Australia	r	43 (3.4)	557 (3.8)	27 (3.2)	527 (6.1)	30 (2.8)	481 (6.4)
Azerbaijan	r	29 (3.4)	494 (8.3)	33 (3.5)	495 (6.5)	38 (3.5)	492 (5.9)
Bahrain		31 (2.5)	491 (8.7)	35 (2.8)	458 (8.1)	34 (2.5)	445 (8.1)
Belgium (Flemish)		52 (4.1)	535 (2.3)	28 (4.1)	525 (6.2)	20 (3.0)	486 (7.6)
Belgium (French)		48 (2.9)	508 (3.4)	26 (3.3)	475 (5.5)	26 (3.0)	468 (5.5)
Bosnia & Herzegovina	r	52 (6.6)	456 (7.1)	40 (6.4)	450 (5.0)	8 (2.0)	426 (11.6)
Brazil		26 (2.9)	439 (9.9)	27 (3.6)	404 (6.3)	47 (3.7)	376 (4.0)
Bulgaria	r	37 (3.9)	568 (5.5)	40 (3.8)	539 (5.1)	23 (2.6)	459 (13.9)
Canada	r	48 (2.6)	522 (2.9)	37 (2.4)	497 (3.3)	16 (2.1)	480 (5.5)
Chile	r	18 (2.7)	489 (6.2)	14 (3.3)	454 (5.5)	69 (3.9)	433 (3.8)
Chinese Taipei		21 (3.3)	620 (3.9)	70 (3.5)	605 (1.9)	9 (1.5)	586 (6.0)
Cyprus		48 (3.3)	529 (3.0)	40 (3.3)	509 (3.2)	12 (2.0)	483 (11.7)
Czech Republic		39 (3.8)	536 (4.3)	53 (4.1)	530 (2.8)	9 (2.1)	504 (8.4)
Denmark	r	60 (3.8)	531 (3.1)	35 (3.7)	520 (3.5)	6 (2.1)	494 (8.7)
England	r	30 (4.2)	581 (6.1)	31 (4.4)	560 (5.3)	39 (4.8)	526 (5.6)
Finland		26 (3.6)	545 (4.2)	54 (3.9)	528 (3.0)	19 (3.4)	506 (6.8)
France	r	45 (4.5)	502 (3.4)	28 (4.4)	477 (6.4)	27 (3.6)	456 (5.4)
Georgia		42 (4.1)	500 (5.5)	30 (3.5)	498 (5.4)	28 (3.7)	498 (6.1)
Germany	r	29 (3.3)	545 (3.7)	39 (3.3)	530 (2.9)	32 (3.0)	503 (6.1)
Hong Kong SAR	s	45 (5.3)	627 (9.8)	30 (5.1)	575 (7.3)	25 (4.9)	575 (11.3)
Hungary		53 (3.9)	548 (4.0)	23 (3.4)	511 (8.6)	24 (3.3)	464 (10.1)
Iran, Islamic Rep. of		28 (3.0)	448 (7.7)	29 (3.1)	428 (6.7)	43 (3.3)	395 (6.4)
Ireland		43 (4.5)	563 (3.7)	31 (4.5)	545 (4.6)	26 (3.4)	521 (5.2)
Italy		38 (3.9)	525 (4.1)	43 (4.1)	516 (5.2)	19 (3.2)	485 (7.3)
Japan		53 (4.1)	599 (3.1)	40 (4.1)	584 (2.9)	7 (2.4)	573 (7.9)
Jordan		18 (3.2)	446 (8.7)	28 (4.2)	442 (11.0)	55 (3.7)	417 (8.2)
Kazakhstan		83 (3.2)	487 (3.7)	15 (3.1)	490 (13.2)	2 ~	~
Korea, Rep. of		27 (4.0)	617 (5.3)	66 (3.9)	589 (2.6)	7 (2.1)	554 (19.4)
Kosovo	r	61 (4.4)	457 (5.1)	28 (4.0)	451 (7.3)	12 (2.9)	438 (11.6)
Kuwait	r	37 (4.5)	397 (10.6)	45 (4.2)	367 (9.2)	19 (3.6)	394 (13.4)
Latvia		62 (3.9)	543 (3.9)	35 (3.7)	522 (3.9)	3 (1.3)	501 (10.8)
Lithuania		81 (2.7)	567 (3.2)	16 (2.5)	543 (5.8)	3 (1.3)	498 (10.9)
Macao SAR		20 (0.1)	589 (2.8)	59 (0.1)	585 (1.4)	22 (0.1)	569 (1.9)
Montenegro		28 (0.5)	480 (3.4)	51 (0.6)	480 (2.7)	22 (0.6)	473 (4.3)
Morocco	r	7 (2.6)	427 (32.4)	23 (3.7)	435 (9.0)	70 (3.7)	377 (6.6)
Netherlands	s	62 (4.7)	550 (3.2)	17 (4.5)	531 (5.0)	21 (4.4)	504 (6.5)
New Zealand	r	39 (4.5)	517 (5.2)	40 (4.9)	497 (4.4)	21 (3.7)	446 (9.3)
North Macedonia		59 (3.4)	490 (4.6)	28 (3.3)	460 (6.9)	12 (2.6)	445 (12.8)
Norway (5)	r	52 (4.2)	539 (3.1)	39 (4.1)	527 (3.2)	9 (2.2)	512 (10.6)
Oman		41 (3.5)	422 (7.1)	37 (3.8)	416 (6.6)	21 (2.7)	415 (9.0)
Poland		36 (4.0)	560 (3.5)	54 (3.7)	540 (2.3)	9 (2.4)	524 (7.4)
Portugal		36 (3.4)	536 (5.3)	45 (3.6)	509 (3.9)	19 (2.7)	503 (7.1)
Qatar		67 (3.9)	472 (4.7)	19 (3.2)	459 (9.8)	14 (2.6)	426 (9.1)
Romania	s	52 (6.1)	565 (5.0)	28 (5.6)	528 (14.9)	20 (4.2)	515 (10.5)
Saudi Arabia		32 (3.4)	431 (7.5)	38 (3.7)	415 (7.2)	30 (3.1)	416 (7.7)
Serbia		44 (3.7)	538 (3.9)	41 (4.1)	516 (5.8)	15 (2.8)	495 (9.8)
Singapore		57 (0.0)	626 (3.5)	37 (0.0)	602 (4.8)	6 (0.0)	581 (12.6)
Slovak Republic		53 (3.9)	532 (2.9)	33 (3.7)	519 (4.8)	14 (2.2)	438 (14.6)
Slovenia		24 (4.1)	515 (4.2)	54 (4.9)	516 (2.3)	22 (3.5)	507 (4.0)
South Africa (5)	s	9 (2.5)	490 (25.9)	17 (3.2)	386 (14.4)	73 (3.5)	337 (4.8)
Spain		53 (2.5)	512 (2.6)	26 (2.6)	494 (3.2)	21 (2.2)	468 (5.3)
Sweden		62 (3.9)	543 (3.0)	27 (3.6)	517 (4.5)	11 (2.9)	482 (9.9)
Türkiye (5)		42 (3.9)	585 (5.9)	26 (3.5)	547 (7.4)	32 (3.2)	517 (8.2)
United Arab Emirates	r	56 (0.9)	507 (2.6)	26 (0.8)	492 (3.0)	18 (0.8)	478 (3.6)
United States		18 (2.5)	576 (5.9)	34 (3.4)	529 (4.6)	48 (3.3)	484 (4.1)
Uzbekistan		56 (4.0)	444 (4.3)	39 (3.9)	443 (5.4)	4 (1.7)	447 (12.0)
International Average		42 (0.5)	522 (1.0)	35 (0.5)	502 (0.8)	23 (0.4)	479 (1.2)
Benchmarking Participants							
Ontario, Canada	r	44 (4.0)	518 (5.7)	39 (4.0)	500 (6.1)	17 (3.8)	495 (8.8)
Quebec, Canada		55 (4.8)	527 (3.2)	33 (4.5)	506 (5.1)	12 (2.9)	493 (10.3)
Abu Dhabi, UAE	r	58 (2.3)	459 (4.7)	24 (1.9)	438 (5.6)	17 (1.8)	457 (6.6)
Dubai, UAE		63 (0.2)	567 (1.9)	26 (0.2)	543 (2.8)	11 (0.1)	520 (7.0)
Sharjah, UAE	r	52 (1.7)	503 (5.0)	28 (2.1)	512 (6.1)	20 (1.7)	506 (9.9)

() Standard errors appear in parentheses. Because of rounding some results may appear inconsistent.

An "r" indicates data are available for at least 70% but less than 85% of the students.

An "s" indicates data are available for at least 50% but less than 70% of the students.

A tilde (~) indicates insufficient data to report result.

SOURCE: IEA's Trends in International Mathematics and Science Study - TIMSS 2023
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BOSTON COLLEGE

Exhibit 4.1.3: School Composition by Socioeconomic Background of the Student Body – Principals' Reports

Country		More Affluent		Neither More Affluent Nor More Disadvantaged		More Disadvantaged	
		Percent of Students	Average Achievement	Percent of Students	Average Achievement	Percent of Students	Average Achievement
Albania	s	18 (5.0)	522 (7.3)	33 (6.5)	495 (7.3)	50 (6.2)	472 (9.2)
Armenia		65 (4.5)	458 (3.7)	21 (3.5)	457 (6.3)	14 (3.1)	452 (6.8)
Australia	r	43 (3.4)	574 (3.0)	27 (3.2)	551 (4.1)	30 (2.8)	515 (5.5)
Azerbaijan	r	29 (3.4)	421 (6.5)	33 (3.5)	423 (5.7)	38 (3.5)	419 (5.4)
Bahrain		31 (2.5)	501 (8.5)	35 (2.8)	473 (8.9)	34 (2.5)	458 (7.5)
Belgium (Flemish)		52 (4.1)	506 (2.7)	28 (4.1)	491 (6.0)	20 (3.0)	447 (7.9)
Belgium (French)		48 (2.9)	503 (3.4)	26 (3.3)	467 (5.7)	26 (3.0)	453 (6.1)
Bosnia & Herzegovina	r	52 (6.6)	458 (5.6)	40 (6.4)	449 (5.6)	8 (2.0)	433 (9.1)
Brazil		26 (2.9)	466 (9.4)	27 (3.6)	432 (6.9)	47 (3.7)	399 (4.7)
Bulgaria	r	37 (3.9)	575 (6.3)	40 (3.8)	544 (6.3)	23 (2.6)	443 (20.0)
Canada	r	48 (2.6)	534 (2.9)	37 (2.4)	518 (3.0)	16 (2.1)	503 (5.1)
Chile	r	18 (2.7)	523 (5.6)	14 (3.3)	490 (5.1)	69 (3.9)	469 (3.4)
Chinese Taipei		21 (3.3)	588 (3.9)	70 (3.5)	570 (2.0)	9 (1.5)	552 (6.9)
Cyprus		48 (3.3)	502 (3.6)	40 (3.3)	481 (4.1)	12 (2.0)	441 (14.3)
Czech Republic		39 (3.8)	530 (4.3)	53 (4.1)	526 (2.9)	9 (2.1)	501 (7.9)
Denmark	r	60 (3.8)	531 (3.4)	35 (3.7)	518 (4.3)	6 (2.1)	486 (10.6)
England	r	30 (4.2)	585 (5.5)	31 (4.4)	563 (4.1)	39 (4.8)	531 (5.2)
Finland		26 (3.6)	554 (4.5)	54 (3.9)	543 (3.2)	19 (3.4)	515 (7.9)
France	r	45 (4.5)	505 (3.5)	28 (4.4)	483 (6.0)	27 (3.6)	458 (5.9)
Georgia		42 (4.1)	469 (5.5)	30 (3.5)	462 (5.4)	28 (3.7)	466 (6.1)
Germany	r	29 (3.3)	540 (4.7)	39 (3.3)	526 (3.7)	32 (3.0)	486 (6.7)
Hong Kong SAR	s	45 (5.3)	582 (8.6)	30 (5.1)	523 (7.1)	25 (4.9)	525 (9.7)
Hungary		53 (3.9)	548 (3.7)	23 (3.4)	516 (8.7)	24 (3.3)	473 (8.6)
Iran, Islamic Rep. of		28 (3.0)	466 (7.8)	29 (3.1)	443 (7.7)	43 (3.3)	403 (6.8)
Ireland		43 (4.5)	549 (3.6)	31 (4.5)	529 (5.7)	26 (3.4)	509 (5.4)
Italy		38 (3.9)	522 (3.6)	43 (4.1)	513 (4.4)	19 (3.2)	484 (6.5)
Japan		53 (4.1)	562 (3.0)	40 (4.1)	550 (2.9)	7 (2.4)	533 (7.3)
Jordan		18 (3.2)	440 (8.2)	28 (4.2)	435 (9.5)	55 (3.7)	405 (8.0)
Kazakhstan		83 (3.2)	468 (4.0)	15 (3.1)	459 (12.2)	2 ~	~
Korea, Rep. of		27 (4.0)	601 (4.9)	66 (3.9)	581 (2.4)	7 (2.1)	541 (18.4)
Kosovo	r	61 (4.4)	409 (5.2)	28 (4.0)	404 (6.6)	12 (2.9)	390 (11.6)
Kuwait	r	37 (4.5)	392 (13.3)	45 (4.2)	353 (10.7)	19 (3.6)	397 (15.7)
Latvia		62 (3.9)	533 (4.3)	35 (3.7)	515 (4.3)	3 (1.3)	501 (10.0)
Lithuania		81 (2.7)	542 (3.1)	16 (2.5)	523 (6.0)	3 (1.3)	477 (9.7)
Macao SAR		20 (0.1)	546 (2.7)	59 (0.1)	537 (1.6)	22 (0.1)	523 (2.2)
Montenegro		28 (0.5)	465 (3.9)	51 (0.6)	465 (2.4)	22 (0.6)	455 (4.1)
Morocco	r	7 (2.6)	414 (32.5)	23 (3.7)	435 (9.9)	70 (3.7)	376 (7.7)
Netherlands	s	62 (4.7)	531 (3.6)	17 (4.5)	512 (5.5)	21 (4.4)	477 (7.8)
New Zealand	r	39 (4.5)	543 (5.3)	40 (4.9)	524 (3.8)	21 (3.7)	474 (10.1)
North Macedonia		59 (3.4)	459 (4.8)	28 (3.3)	424 (7.8)	12 (2.6)	401 (13.2)
Norway (5)	r	52 (4.2)	541 (3.2)	39 (4.1)	524 (3.9)	9 (2.2)	513 (10.6)
Oman		41 (3.5)	434 (7.1)	37 (3.8)	430 (7.1)	21 (2.7)	420 (9.2)
Poland		36 (4.0)	563 (3.4)	54 (3.7)	545 (2.5)	9 (2.4)	524 (7.8)
Portugal		36 (3.4)	527 (3.8)	45 (3.6)	504 (3.4)	19 (2.7)	497 (5.7)
Qatar		67 (3.9)	479 (5.1)	19 (3.2)	473 (11.4)	14 (2.6)	436 (8.3)
Romania	s	52 (6.1)	546 (5.0)	28 (5.6)	515 (14.5)	20 (4.2)	500 (10.5)
Saudi Arabia		32 (3.4)	439 (7.6)	38 (3.7)	421 (7.3)	30 (3.1)	426 (8.2)
Serbia		44 (3.7)	523 (3.7)	41 (4.1)	504 (5.1)	15 (2.8)	485 (8.0)
Singapore		57 (0.0)	619 (3.2)	37 (0.0)	594 (4.5)	6 (0.0)	576 (10.8)
Slovak Republic		53 (3.9)	540 (3.4)	33 (3.7)	528 (4.8)	14 (2.2)	426 (16.9)
Slovenia		24 (4.1)	528 (4.4)	54 (4.9)	527 (2.5)	22 (3.5)	517 (4.5)
South Africa (5)	s	9 (2.5)	486 (35.5)	17 (3.2)	340 (19.7)	73 (3.5)	274 (6.5)
Spain		53 (2.5)	517 (2.3)	26 (2.6)	501 (3.6)	21 (2.2)	475 (5.4)
Sweden		62 (3.9)	548 (3.4)	27 (3.6)	520 (4.6)	11 (2.9)	467 (11.9)
Türkiye (5)		42 (3.9)	596 (4.8)	26 (3.5)	566 (5.8)	32 (3.2)	540 (7.2)
United Arab Emirates	r	56 (0.9)	504 (3.3)	26 (0.8)	488 (3.8)	18 (0.8)	473 (4.3)
United States		18 (2.5)	585 (5.4)	34 (3.4)	547 (4.3)	48 (3.3)	501 (3.9)
Uzbekistan		56 (4.0)	411 (4.8)	39 (3.9)	413 (5.1)	4 (1.7)	410 (15.9)
International Average		42 (0.5)	514 (1.1)	35 (0.5)	494 (0.9)	23 (0.4)	468 (1.2)
Benchmarking Participants							
Ontario, Canada	r	44 (4.0)	536 (5.4)	39 (4.0)	524 (5.1)	17 (3.8)	519 (7.5)
Quebec, Canada		55 (4.8)	518 (3.4)	33 (4.5)	502 (4.4)	12 (2.9)	486 (7.3)
Abu Dhabi, UAE	r	58 (2.3)	447 (5.9)	24 (1.9)	420 (7.0)	17 (1.8)	443 (8.8)
Dubai, UAE		63 (0.2)	573 (2.3)	26 (0.2)	551 (3.5)	11 (0.1)	525 (6.5)
Sharjah, UAE	r	52 (1.7)	499 (5.3)	28 (2.1)	511 (7.3)	20 (1.7)	504 (11.8)

() Standard errors appear in parentheses. Because of rounding some results may appear inconsistent.

An "r" indicates data are available for at least 70% but less than 85% of the students.

An "s" indicates data are available for at least 50% but less than 70% of the students.

A tilde (~) indicates insufficient data to report result.

SOURCE: IEA's Trends in International Mathematics and Science Study - TIMSS 2023
Downloaded from <https://timss2023.org/results>

Exhibit 4.1.4: School Composition by Socioeconomic Background of the Student Body – Principals' Reports

Country		More Affluent		Neither More Affluent Nor More Disadvantaged		More Disadvantaged	
		Percent of Students	Average Achievement	Percent of Students	Average Achievement	Percent of Students	Average Achievement
Australia	r	36 (3.7)	540 (5.3)	34 (4.2)	516 (5.6)	30 (2.9)	473 (9.0)
Austria		25 (3.1)	533 (4.2)	50 (3.6)	525 (3.6)	25 (2.7)	465 (7.3)
Azerbaijan	r	25 (3.7)	497 (7.3)	32 (3.8)	468 (9.7)	43 (3.9)	479 (5.3)
Bahrain		25 (0.9)	478 (4.1)	44 (0.8)	410 (4.4)	31 (0.8)	403 (3.9)
Brazil		28 (2.2)	418 (5.0)	23 (2.6)	379 (6.4)	49 (2.8)	355 (4.6)
Chile	r	16 (2.6)	476 (10.4)	15 (3.7)	440 (10.5)	69 (4.3)	398 (4.5)
Chinese Taipei		28 (3.6)	646 (6.5)	55 (4.3)	597 (5.1)	18 (2.6)	559 (6.4)
Cote d'Ivoire		4 (1.5)	269 (18.5)	10 (2.2)	289 (16.1)	85 (2.7)	256 (3.2)
Cyprus		52 (0.9)	514 (4.7)	38 (0.9)	477 (3.0)	10 (0.2)	457 (4.7)
Czech Republic		45 (3.4)	531 (3.8)	47 (3.4)	510 (4.0)	8 (1.8)	478 (11.0)
England	r	29 (4.2)	559 (7.9)	31 (4.8)	538 (10.9)	40 (4.6)	484 (10.0)
Finland		26 (3.2)	513 (5.2)	57 (3.9)	505 (3.6)	17 (2.8)	486 (5.8)
France		38 (4.0)	508 (4.8)	25 (3.9)	484 (4.8)	37 (3.8)	447 (5.3)
Georgia		48 (3.8)	471 (5.4)	28 (3.6)	461 (6.0)	23 (3.3)	468 (7.9)
Hong Kong SAR	s	22 (3.5)	628 (20.4)	39 (4.6)	598 (9.4)	39 (4.9)	545 (10.7)
Hungary		46 (3.9)	540 (5.1)	30 (4.0)	499 (5.3)	24 (3.5)	454 (8.4)
Iran, Islamic Rep. of		19 (2.5)	478 (9.1)	19 (2.6)	452 (7.0)	62 (3.0)	397 (4.6)
Ireland		41 (4.3)	542 (3.3)	37 (4.6)	520 (3.9)	22 (3.1)	498 (5.7)
Israel		35 (3.4)	518 (6.7)	31 (3.5)	508 (9.3)	34 (2.7)	435 (7.5)
Italy		40 (4.1)	519 (3.8)	40 (4.3)	495 (5.1)	20 (3.4)	481 (8.4)
Japan		54 (3.7)	602 (4.8)	39 (3.6)	589 (3.3)	7 (1.8)	568 (6.2)
Jordan		20 (2.5)	430 (12.2)	34 (3.7)	382 (5.2)	46 (3.8)	377 (5.4)
Kazakhstan		83 (3.0)	460 (4.5)	16 (2.9)	444 (9.5)	1 ~	~ ~
Korea, Rep. of		27 (3.7)	624 (5.9)	61 (4.1)	587 (3.5)	12 (2.3)	580 (5.7)
Kuwait	r	70 (4.3)	389 (8.0)	22 (4.0)	419 (19.7)	8 (2.5)	428 (23.3)
Lithuania		68 (3.6)	521 (3.9)	28 (3.4)	489 (6.3)	4 (1.5)	494 (10.0)
Malaysia		9 (2.0)	462 (13.5)	22 (3.2)	438 (7.6)	69 (3.7)	395 (3.8)
Malta		38 (0.1)	504 (1.8)	59 (0.1)	499 (1.4)	3 (0.0)	421 (5.2)
Morocco		9 (2.3)	428 (14.1)	18 (3.2)	389 (10.0)	73 (3.3)	369 (3.9)
Norway (9)	r	53 (4.2)	509 (3.3)	40 (4.3)	495 (3.5)	7 (2.4)	497 (5.1)
Oman		35 (3.1)	423 (5.5)	40 (3.4)	410 (4.3)	25 (2.7)	399 (4.4)
Palestinian Nat'l Auth.		16 (2.1)	398 (8.4)	39 (3.3)	389 (5.8)	45 (3.5)	376 (4.0)
Portugal		28 (3.6)	497 (5.7)	32 (3.6)	473 (4.2)	40 (4.0)	459 (4.4)
Qatar		68 (4.2)	457 (5.7)	25 (3.6)	436 (10.6)	7 (2.4)	436 (13.6)
Romania	s	49 (5.7)	516 (8.0)	30 (5.8)	475 (12.7)	21 (4.5)	484 (12.8)
Saudi Arabia		34 (3.4)	407 (6.1)	37 (3.8)	393 (6.4)	29 (3.6)	387 (7.0)
Singapore		49 (4.1)	636 (7.8)	43 (4.2)	584 (8.1)	8 (2.2)	525 (19.7)
South Africa (9)	r	8 (1.9)	479 (16.6)	13 (2.4)	424 (10.6)	79 (2.8)	381 (3.7)
Sweden		66 (4.1)	521 (2.5)	28 (4.1)	511 (6.9)	7 (2.0)	485 (6.5)
Türkiye		37 (4.9)	529 (8.4)	30 (4.2)	508 (9.9)	33 (4.5)	478 (8.2)
United Arab Emirates		54 (1.7)	504 (3.3)	28 (1.6)	483 (4.9)	18 (1.3)	456 (5.3)
United States		12 (2.3)	526 (10.7)	40 (3.9)	511 (6.4)	48 (3.6)	463 (6.0)
Uzbekistan		52 (3.6)	424 (7.6)	42 (3.6)	420 (5.5)	6 (1.8)	404 (13.1)
International Average		36 (0.5)	498 (1.3)	34 (0.6)	475 (1.2)	30 (0.5)	449 (1.3)
Benchmarking Participants							
Abu Dhabi, UAE	r	59 (3.9)	461 (5.3)	25 (3.0)	444 (6.7)	16 (2.6)	434 (8.7)
Dubai, UAE	r	66 (2.6)	564 (4.3)	25 (2.5)	535 (11.1)	10 (2.0)	496 (11.5)
Sharjah, UAE	r	48 (3.8)	499 (8.6)	31 (4.6)	514 (13.9)	21 (3.4)	476 (9.9)

() Standard errors appear in parentheses. Because of rounding some results may appear inconsistent.
 An "r" indicates data are available for at least 70% but less than 85% of the students.
 An "s" indicates data are available for at least 50% but less than 70% of the students.
 A tilde (~) indicates insufficient data to report result.

SOURCE: IEA's Trends in International Mathematics and Science Study - TIMSS 2023
 Downloaded from <https://timss2023.org/results>

Exhibit 4.1.5: School Composition by Socioeconomic Background of the Student Body – Principals' Reports

Country		More Affluent		Neither More Affluent Nor More Disadvantaged		More Disadvantaged	
		Percent of Students	Average Achievement	Percent of Students	Average Achievement	Percent of Students	Average Achievement
Australia	r	36 (3.7)	548 (4.8)	34 (4.2)	527 (4.9)	30 (2.9)	487 (7.7)
Austria		25 (3.1)	538 (4.1)	50 (3.6)	526 (4.0)	25 (2.7)	455 (7.7)
Azerbaijan	r	25 (3.7)	423 (6.3)	32 (3.8)	405 (6.4)	43 (3.9)	413 (4.6)
Bahrain		25 (0.9)	498 (3.7)	44 (0.8)	438 (4.4)	31 (0.8)	427 (4.5)
Brazil		28 (2.2)	456 (3.8)	23 (2.6)	422 (6.3)	49 (2.8)	398 (4.1)
Chile	r	16 (2.6)	511 (9.5)	15 (3.7)	475 (9.7)	69 (4.3)	438 (3.8)
Chinese Taipei		28 (3.6)	608 (6.0)	55 (4.3)	567 (4.0)	18 (2.6)	538 (4.8)
Cote d'Ivoire		4 (1.5)	199 (31.6)	10 (2.2)	234 (26.1)	85 (2.7)	170 (5.9)
Cyprus		52 (0.9)	484 (5.1)	38 (0.9)	448 (3.2)	10 (0.2)	426 (5.3)
Czech Republic		45 (3.4)	538 (3.2)	47 (3.4)	521 (3.4)	8 (1.8)	492 (9.9)
England	r	29 (4.2)	564 (7.0)	31 (4.8)	542 (9.8)	40 (4.6)	492 (9.3)
Finland		26 (3.2)	537 (6.2)	57 (3.9)	533 (4.2)	17 (2.8)	513 (7.4)
France		38 (4.0)	513 (4.5)	25 (3.9)	493 (5.0)	37 (3.8)	457 (5.3)
Georgia		48 (3.8)	453 (4.4)	28 (3.6)	440 (4.9)	23 (3.3)	449 (5.9)
Hong Kong SAR	s	22 (3.5)	575 (18.2)	39 (4.6)	541 (9.1)	39 (4.9)	503 (8.9)
Hungary		46 (3.9)	549 (4.3)	30 (4.0)	518 (4.7)	24 (3.5)	478 (7.6)
Iran, Islamic Rep. of		19 (2.5)	472 (8.3)	19 (2.6)	447 (6.7)	62 (3.0)	393 (4.7)
Ireland		41 (4.3)	547 (3.6)	37 (4.6)	521 (4.8)	22 (3.1)	503 (6.7)
Israel		35 (3.4)	505 (6.3)	31 (3.5)	497 (8.6)	34 (2.7)	438 (7.2)
Italy		40 (4.1)	518 (3.7)	40 (4.3)	496 (5.7)	20 (3.4)	479 (8.0)
Japan		54 (3.7)	563 (4.9)	39 (3.6)	552 (3.2)	7 (1.8)	537 (5.4)
Jordan		20 (2.5)	456 (14.3)	34 (3.7)	408 (5.6)	46 (3.8)	399 (5.6)
Kazakhstan		83 (3.0)	449 (3.9)	16 (2.9)	423 (6.7)	1 ~	~ ~
Korea, Rep. of		27 (3.7)	566 (4.9)	61 (4.1)	539 (2.6)	12 (2.3)	533 (5.0)
Kuwait	r	70 (4.3)	414 (8.7)	22 (4.0)	427 (17.3)	8 (2.5)	452 (23.4)
Lithuania		68 (3.6)	525 (3.6)	28 (3.4)	499 (5.2)	4 (1.5)	500 (11.4)
Malaysia		9 (2.0)	471 (13.0)	22 (3.2)	453 (7.2)	69 (3.7)	412 (4.3)
Malta		38 (0.1)	506 (2.4)	59 (0.1)	501 (2.0)	3 (0.0)	416 (8.1)
Morocco		9 (2.3)	382 (16.7)	18 (3.2)	349 (10.4)	73 (3.3)	316 (4.4)
Norway (9)	r	53 (4.2)	497 (3.9)	40 (4.3)	484 (3.9)	7 (2.4)	479 (7.7)
Oman		35 (3.1)	465 (5.4)	40 (3.4)	458 (4.6)	25 (2.7)	441 (4.4)
Palestinian Nat'l Auth.		16 (2.1)	409 (7.6)	39 (3.3)	400 (5.8)	45 (3.5)	387 (4.4)
Portugal		28 (3.6)	524 (5.0)	32 (3.6)	503 (4.0)	40 (4.0)	492 (4.2)
Qatar		68 (4.2)	485 (5.6)	25 (3.6)	469 (10.1)	7 (2.4)	479 (11.2)
Romania	s	49 (5.7)	483 (6.1)	30 (5.8)	452 (10.8)	21 (4.5)	454 (9.4)
Saudi Arabia		34 (3.4)	429 (6.8)	37 (3.8)	418 (6.4)	29 (3.6)	407 (7.8)
Singapore		49 (4.1)	636 (7.2)	43 (4.2)	584 (8.0)	8 (2.2)	531 (19.3)
South Africa (9)	r	8 (1.9)	469 (23.4)	13 (2.4)	406 (15.1)	79 (2.8)	343 (5.4)
Sweden		66 (4.1)	528 (3.3)	28 (4.1)	512 (8.4)	7 (2.0)	481 (10.3)
Türkiye		37 (4.9)	544 (6.7)	30 (4.2)	531 (8.1)	33 (4.5)	506 (6.8)
United Arab Emirates		54 (1.7)	502 (3.8)	28 (1.6)	480 (5.8)	18 (1.3)	454 (6.1)
United States		12 (2.3)	549 (8.7)	40 (3.9)	534 (5.8)	48 (3.6)	490 (5.7)
Uzbekistan		52 (3.6)	398 (5.8)	42 (3.6)	397 (4.7)	6 (1.8)	374 (7.0)
International Average		36 (0.5)	495 (1.4)	34 (0.6)	474 (1.2)	30 (0.5)	448 (1.3)
Benchmarking Participants							
Abu Dhabi, UAE	r	59 (3.9)	451 (7.1)	25 (3.0)	429 (8.8)	16 (2.6)	426 (9.8)
Dubai, UAE	r	66 (2.6)	566 (4.7)	25 (2.5)	537 (13.3)	10 (2.0)	495 (13.5)
Sharjah, UAE	r	48 (3.8)	504 (8.4)	31 (4.6)	517 (15.8)	21 (3.4)	478 (11.9)

() Standard errors appear in parentheses. Because of rounding some results may appear inconsistent.
 An "r" indicates data are available for at least 70% but less than 85% of the students.
 An "s" indicates data are available for at least 50% but less than 70% of the students.
 A tilde (~) indicates insufficient data to report result.

SOURCE: IEA's Trends in International Mathematics and Science Study - TIMSS 2023
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Literacy and Numeracy Skills of Entering Student Body – Principals’ Reports

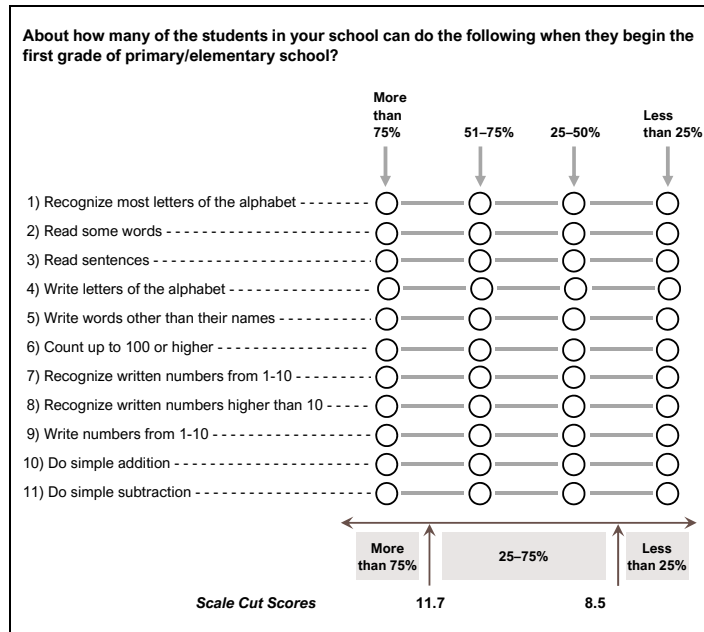
Fourth-grade students in schools where at least 25% of the students begin the primary grades with basic literacy and numeracy skills have higher average mathematics and science achievement than students in schools where less than 25% of students begin the primary grades with these skills. Average achievement differences are much more modest once the 25% threshold is reached. The TIMSS 2023 *Schools Where Students Begin the Primary Grades With Literacy and Numeracy Skills* scale (Exhibit 4.1.6) reflects school principals’ estimates of the percentage of students in the school who possessed a range of literacy and numeracy skills when beginning primary school. Based on principals’ responses, students were classified as attending schools where “more than 75% begin with skills,” “25-75% begin with skills,” or “less than 25% begin with skills.”

On average internationally, 24 percent of students attended schools where “more than 75%” of students begin the primary grades with basic literacy and numeracy skills. There is a great deal of variation in the percent of students in this category across countries, likely because students’ skills when entering primary school are closely related to policies regarding pre-primary education and age of entry to primary school. A small majority of students (56%, on average) attended schools where “25%-75%” of students begin school with these skills and 20 percent of students were in schools where “less than 25%” of students begin school with these skills.

In both mathematics and science (Exhibits 4.1.7 and 4.1.8, respectively), there is a small difference in average achievement between students in schools where “more than 75%” of students begin school with literacy and numeracy skills and students in schools where “25%-75%” of students begin with these skills (512 vs. 502 in mathematics and 504 vs. 493 in science). Students in schools where “less than 25%” of students begin primary schools with literacy and numeracy skills have somewhat lower average achievement in both subjects (481 in mathematics and 471 in science).

Exhibit 4.1.6: Schools Where Students Begin the Primary Grades With Literacy and Numeracy Skills – Principals' Reports**About the Scale**

Students were scored according to their principals' reports regarding the percentage of students in the school who begin primary school with the eleven skills on the *Schools Where Students Begin the Primary Grades with Literacy and Numeracy Skills* scale. Cut scores divide the scale into three categories. Students in schools where **More than 75% Begin with Skills** had a score at or above the cut score corresponding to their principals reporting that "more than 75%" of the students have six of the eleven skills and "51–75%" of the students have the other five, on average. Students in schools where **Less than 25% Begin with Skills** had a score at or below the cut score corresponding to their principals reporting that "less than 25%" of the students have six of the eleven skills and "25–50%" of the students have the other five, on average. All other students attended schools where **25–75% Begin with Skills**.



SOURCE: IEA's Trends in International Mathematics and Science Study - TIMSS 2023
Downloaded from <https://timss2023.org/results>

Exhibit 4.1.7: Schools Where Students Begin the Primary Grades With Literacy and Numeracy Skills –
Principals' Reports

Country	More than 75% Begin with Skills		25–75% Begin with Skills		Less than 25% Begin with Skills		Average Scale Score
	Percent of Students	Average Achievement	Percent of Students	Average Achievement	Percent of Students	Average Achievement	
Albania	48 (5.9)	522 (8.5)	48 (5.6)	501 (7.2)	4 (2.0)	503 (17.2)	11.6 (0.17)
Armenia	12 (2.8)	513 (8.5)	58 (4.6)	516 (3.8)	30 (4.1)	507 (5.9)	9.3 (0.15)
Australia	6 (1.9)	570 (12.8)	47 (4.3)	540 (5.1)	48 (4.0)	509 (5.1)	8.7 (0.14)
Azerbaijan	27 (4.0)	498 (8.6)	60 (4.2)	493 (4.1)	13 (2.2)	494 (12.2)	10.6 (0.14)
Bahrain	38 (3.1)	480 (8.0)	54 (3.3)	452 (5.3)	8 (1.8)	434 (19.1)	11.1 (0.11)
Belgium (Flemish)	2 ~	~	76 (3.9)	526 (3.0)	22 (3.8)	512 (7.4)	9.3 (0.09)
Belgium (French)	8 (2.7)	499 (11.8)	76 (3.4)	494 (2.7)	16 (2.5)	460 (7.6)	9.8 (0.12)
Bosnia & Herzegovina	4 (2.4)	418 (14.7)	64 (5.1)	456 (5.2)	31 (4.9)	442 (7.3)	9.3 (0.15)
Brazil	19 (3.0)	439 (10.1)	51 (3.8)	395 (4.3)	30 (2.9)	386 (8.9)	9.9 (0.13)
Bulgaria	21 (3.0)	571 (6.7)	62 (4.2)	538 (3.7)	17 (2.9)	453 (13.9)	10.2 (0.12)
Canada	24 (2.1)	519 (5.2)	68 (2.4)	501 (2.4)	8 (1.4)	494 (7.4)	10.6 (0.09)
Chile	18 (3.9)	453 (8.9)	57 (4.4)	450 (4.6)	25 (3.9)	435 (6.8)	9.9 (0.18)
Chinese Taipei	45 (3.3)	611 (2.8)	47 (3.7)	604 (2.4)	8 (1.9)	607 (5.5)	11.4 (0.12)
Cyprus	6 (2.1)	538 (9.5)	62 (3.9)	520 (3.5)	32 (3.4)	506 (4.6)	9.2 (0.10)
Czech Republic	1 ~	~	46 (3.9)	534 (3.5)	54 (3.9)	526 (3.2)	8.6 (0.09)
Denmark	4 (1.7)	532 (9.2)	77 (4.2)	527 (2.8)	19 (3.9)	517 (5.7)	9.5 (0.11)
England	47 (5.1)	568 (5.3)	47 (4.9)	547 (6.4)	6 (2.6)	514 (11.2)	11.3 (0.18)
Finland	14 (3.1)	545 (4.7)	82 (3.3)	526 (2.4)	4 (1.6)	501 (27.5)	10.6 (0.10)
France	9 (2.5)	505 (9.4)	87 (3.1)	481 (3.2)	4 (1.8)	439 (14.8)	10.4 (0.09)
Georgia	4 (1.6)	504 (16.6)	55 (4.2)	499 (4.7)	40 (4.2)	496 (5.3)	8.9 (0.13)
Germany	0 ~	~	47 (3.5)	535 (2.7)	53 (3.5)	518 (3.9)	8.5 (0.08)
Hong Kong SAR	74 (3.4)	606 (6.1)	26 (3.4)	575 (10.6)	0 ~	~	12.5 (0.09)
Hungary	0 ~	~	34 (4.0)	542 (6.8)	66 (4.0)	508 (5.6)	8.0 (0.11)
Iran, Islamic Rep. of	10 (2.2)	423 (11.8)	34 (3.3)	421 (7.4)	56 (3.6)	417 (5.6)	8.6 (0.15)
Ireland	80 (3.4)	552 (3.2)	20 (3.4)	527 (8.1)	0 ~	~	12.7 (0.09)
Italy	5 (1.6)	509 (13.1)	57 (3.8)	516 (3.9)	38 (3.8)	510 (4.8)	9.1 (0.13)
Japan	34 (3.6)	602 (3.3)	64 (3.8)	585 (2.7)	3 (1.4)	594 (16.3)	11.1 (0.11)
Jordan	30 (4.2)	432 (10.3)	53 (4.3)	427 (7.7)	17 (2.7)	420 (13.4)	10.7 (0.17)
Kazakhstan	20 (3.0)	490 (9.1)	73 (3.3)	487 (4.5)	7 (1.7)	484 (11.0)	10.5 (0.11)
Korea, Rep. of	57 (4.4)	604 (3.2)	43 (4.4)	582 (5.0)	0 ~	~	11.9 (0.13)
Kosovo	24 (4.0)	448 (7.7)	65 (4.6)	453 (3.8)	11 (2.9)	433 (21.5)	10.6 (0.14)
Kuwait	27 (3.2)	422 (10.9)	52 (4.2)	374 (7.4)	21 (3.4)	338 (7.7)	10.4 (0.13)
Latvia	50 (4.2)	539 (3.2)	47 (4.1)	530 (4.6)	3 (2.4)	515 (7.3)	11.7 (0.12)
Lithuania	16 (3.2)	567 (8.7)	79 (3.6)	561 (3.4)	5 (1.8)	538 (16.2)	10.5 (0.11)
Macao SAR	42 (0.1)	578 (1.5)	57 (0.1)	586 (1.4)	2 ~	~	11.6 (0.00)
Montenegro	1 ~	~	54 (0.6)	483 (2.8)	45 (0.7)	474 (2.5)	8.7 (0.02)
Morocco	17 (2.9)	406 (12.8)	60 (3.7)	397 (5.4)	22 (3.0)	390 (12.2)	9.9 (0.14)
Netherlands	20 (5.6)	542 (6.5)	77 (5.7)	537 (3.4)	3 (1.7)	486 (27.7)	10.7 (0.20)
New Zealand	5 (1.8)	502 (8.7)	41 (4.9)	504 (5.9)	54 (4.7)	483 (5.7)	8.6 (0.14)
North Macedonia	8 (2.1)	465 (10.6)	57 (3.5)	487 (4.8)	36 (3.5)	459 (6.5)	9.3 (0.13)
Norway (5)	1 ~	~	74 (3.8)	534 (2.7)	25 (3.8)	525 (4.6)	9.3 (0.10)
Oman	24 (2.8)	439 (7.6)	58 (3.3)	415 (5.8)	17 (2.7)	410 (9.8)	10.4 (0.13)
Poland	25 (3.8)	542 (4.6)	72 (3.9)	547 (2.6)	3 (1.3)	545 (13.9)	10.9 (0.10)
Portugal	7 (2.1)	519 (12.6)	60 (4.0)	516 (3.8)	33 (3.5)	517 (5.0)	9.3 (0.13)
Qatar	53 (3.2)	477 (5.7)	36 (3.0)	445 (5.8)	11 (2.4)	451 (13.8)	11.3 (0.15)
Romania	57 (5.7)	551 (8.9)	31 (5.4)	543 (7.0)	12 (4.0)	518 (22.0)	11.5 (0.27)
Saudi Arabia	29 (3.2)	423 (7.2)	50 (3.6)	421 (5.9)	21 (2.9)	412 (9.9)	10.3 (0.14)
Serbia	2 ~	~	87 (2.8)	524 (3.7)	11 (2.6)	506 (9.1)	9.7 (0.09)
Singapore	82 (0.0)	618 (3.1)	18 (0.0)	598 (7.0)	1 ~	~	12.6 (0.00)
Slovak Republic	3 (1.4)	535 (11.3)	62 (3.6)	527 (3.1)	35 (3.6)	492 (7.5)	8.9 (0.12)
Slovenia	1 ~	~	55 (4.2)	512 (2.2)	44 (4.1)	514 (3.2)	8.8 (0.10)
South Africa (5)	17 (3.4)	390 (19.6)	68 (4.2)	352 (6.0)	16 (2.9)	353 (13.5)	10.2 (0.12)
Spain	50 (2.6)	508 (2.8)	48 (2.6)	490 (3.3)	2 ~	~	11.6 (0.07)
Sweden	46 (4.6)	539 (3.4)	50 (4.5)	521 (5.2)	5 (1.8)	512 (17.3)	11.2 (0.16)
Türkiye (5)	27 (3.9)	560 (11.4)	45 (4.1)	557 (7.1)	28 (3.9)	545 (8.0)	10.1 (0.20)
United Arab Emirates	56 (0.9)	532 (1.8)	35 (1.0)	459 (3.1)	9 (0.3)	427 (3.9)	11.6 (0.03)
United States	34 (3.2)	544 (5.7)	46 (3.4)	503 (4.3)	19 (2.6)	500 (7.8)	10.6 (0.15)
Uzbekistan	27 (3.5)	450 (7.0)	70 (3.6)	441 (3.7)	3 (1.0)	454 (8.4)	10.8 (0.12)
International Average	24 (0.4)	512 (1.3)	56 (0.5)	502 (0.6)	20 (0.4)	481 (1.6)	
Benchmarking Participants							
Ontario, Canada	32 (3.9)	511 (7.2)	62 (4.3)	498 (4.2)	6 (2.4)	522 (12.4)	10.9 (0.14)
Quebec, Canada	8 (2.7)	531 (9.4)	80 (3.3)	516 (3.5)	11 (3.0)	506 (6.3)	10.1 (0.15)
Abu Dhabi, UAE	43 (1.9)	500 (3.6)	43 (2.1)	424 (4.3)	14 (0.9)	405 (6.1)	10.9 (0.05)
Dubai, UAE	79 (0.2)	572 (1.8)	18 (0.2)	499 (4.1)	3 (0.0)	470 (15.1)	12.6 (0.01)
Sharjah, UAE	54 (2.8)	526 (5.9)	35 (2.7)	487 (6.5)	10 (0.3)	459 (4.8)	11.6 (0.09)

This TIMSS context questionnaire scale was established in 2015 based on the combined response distribution of countries that participated in TIMSS 2015. To provide a point of reference for country comparisons, the scale centerpoint of 10 was located at the mean of the combined distribution. The units of the scale were chosen so that 2 scale score points corresponded to the standard deviation of the distribution.

() Standard errors appear in parentheses. Because of rounding some results may appear inconsistent.

An "r" indicates data are available for at least 70% but less than 85% of the students.

An "s" indicates data are available for at least 50% but less than 70% of the students.

A tilde (~) indicates insufficient data to report result.

SOURCE: IEA's Trends in International Mathematics and Science Study - TIMSS 2023
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Exhibit 4.1.8: Schools Where Students Begin the Primary Grades With Literacy and Numeracy Skills – Principals' Reports

Country	More than 75% Begin with Skills		25–75% Begin with Skills		Less than 25% Begin with Skills		Average Scale Score
	Percent of Students	Average Achievement	Percent of Students	Average Achievement	Percent of Students	Average Achievement	
Albania	48 (5.9)	495 (8.0)	48 (5.6)	486 (6.6)	4 (2.0)	489 (18.1)	11.6 (0.17)
Armenia	12 (2.8)	456 (8.1)	58 (4.6)	461 (3.7)	30 (4.1)	451 (5.0)	9.3 (0.15)
Australia	6 (1.9)	585 (8.5)	47 (4.3)	560 (4.2)	48 (4.0)	539 (4.3)	8.7 (0.14)
Azerbaijan	27 (4.0)	424 (7.3)	60 (4.2)	421 (3.8)	13 (2.2)	420 (9.5)	10.6 (0.14)
Bahrain	38 (3.1)	498 (7.5)	54 (3.3)	464 (5.4)	8 (1.8)	430 (19.1)	11.1 (0.11)
Belgium (Flemish)	2 ~	~	76 (3.9)	494 (3.3)	22 (3.8)	479 (7.7)	9.3 (0.09)
Belgium (French)	8 (2.7)	491 (11.4)	76 (3.4)	486 (3.0)	16 (2.5)	448 (8.3)	9.8 (0.12)
Bosnia & Herzegovina	4 (2.4)	427 (12.4)	64 (5.1)	458 (4.4)	31 (4.9)	442 (7.7)	9.3 (0.15)
Brazil	19 (3.0)	469 (9.3)	51 (3.8)	420 (4.8)	30 (2.9)	409 (8.7)	9.9 (0.13)
Bulgaria	21 (3.0)	577 (7.2)	62 (4.2)	541 (4.8)	17 (2.9)	433 (18.2)	10.2 (0.12)
Canada	24 (2.1)	542 (4.9)	68 (2.4)	518 (2.2)	8 (1.4)	510 (6.7)	10.6 (0.09)
Chile	18 (3.9)	488 (8.8)	57 (4.4)	485 (4.1)	25 (3.9)	470 (6.0)	9.9 (0.18)
Chinese Taipei	45 (3.3)	576 (3.0)	47 (3.7)	569 (2.5)	8 (1.9)	575 (5.5)	11.4 (0.12)
Cyprus	6 (2.1)	521 (15.2)	62 (3.9)	492 (4.2)	32 (3.4)	473 (5.6)	9.2 (0.10)
Czech Republic	1 ~	~	46 (3.9)	530 (3.6)	54 (3.9)	521 (3.3)	8.6 (0.09)
Denmark	4 (1.7)	532 (12.6)	77 (4.2)	527 (3.3)	19 (3.9)	512 (6.6)	9.5 (0.11)
England	47 (5.1)	570 (4.8)	47 (4.9)	551 (5.5)	6 (2.6)	526 (11.0)	11.3 (0.18)
Finland	14 (3.1)	561 (4.7)	82 (3.3)	539 (3.0)	4 (1.6)	498 (29.8)	10.6 (0.10)
France	9 (2.5)	508 (9.1)	87 (3.1)	485 (3.4)	4 (1.8)	439 (15.9)	10.4 (0.09)
Georgia	4 (1.6)	476 (18.0)	55 (4.2)	464 (4.5)	40 (4.2)	465 (5.5)	8.9 (0.13)
Germany	0 ~	~	47 (3.5)	528 (3.7)	53 (3.5)	509 (4.6)	8.5 (0.08)
Hong Kong SAR	74 (3.4)	556 (5.3)	26 (3.4)	525 (10.1)	0 ~	~	12.5 (0.09)
Hungary	0 ~	~	34 (4.0)	543 (6.5)	66 (4.0)	513 (4.9)	8.0 (0.11)
Iran, Islamic Rep. of	10 (2.2)	431 (13.7)	34 (3.3)	436 (8.1)	56 (3.6)	429 (5.8)	8.6 (0.15)
Ireland	80 (3.4)	537 (3.6)	20 (3.4)	514 (7.5)	0 ~	~	12.7 (0.09)
Italy	5 (1.6)	498 (13.7)	57 (3.8)	514 (3.5)	38 (3.8)	509 (4.0)	9.1 (0.13)
Japan	34 (3.6)	567 (3.5)	64 (3.8)	549 (2.6)	3 (1.4)	555 (19.0)	11.1 (0.11)
Jordan	30 (4.2)	426 (8.8)	53 (4.3)	417 (7.5)	17 (2.7)	409 (13.7)	10.7 (0.17)
Kazakhstan	20 (3.0)	470 (9.4)	73 (3.3)	466 (4.4)	7 (1.7)	469 (12.5)	10.5 (0.11)
Korea, Rep. of	57 (4.4)	591 (2.9)	43 (4.4)	574 (4.8)	0 ~	~	11.9 (0.13)
Kosovo	24 (4.0)	398 (6.7)	65 (4.6)	405 (4.2)	11 (2.9)	387 (19.5)	10.6 (0.14)
Kuwait	27 (3.2)	424 (13.7)	52 (4.2)	361 (8.3)	21 (3.4)	329 (9.8)	10.4 (0.13)
Latvia	50 (4.2)	530 (3.8)	47 (4.1)	522 (4.4)	3 (2.4)	496 (18.9)	11.7 (0.12)
Lithuania	16 (3.2)	545 (7.9)	79 (3.6)	536 (3.4)	5 (1.8)	522 (15.2)	10.5 (0.11)
Macao SAR	42 (0.1)	535 (2.0)	57 (0.1)	539 (1.6)	2 ~	~	11.6 (0.00)
Montenegro	1 ~	~	54 (0.6)	467 (2.9)	45 (0.7)	458 (2.4)	8.7 (0.02)
Morocco	17 (2.9)	399 (13.4)	60 (3.7)	394 (6.2)	22 (3.0)	390 (13.7)	9.9 (0.14)
Netherlands	20 (5.6)	522 (7.1)	77 (5.7)	516 (3.9)	3 (1.7)	446 (29.4)	10.7 (0.20)
New Zealand	5 (1.8)	536 (7.7)	41 (4.9)	529 (5.5)	54 (4.7)	509 (6.0)	8.6 (0.14)
North Macedonia	8 (2.1)	422 (13.1)	57 (3.5)	454 (5.1)	36 (3.5)	425 (7.0)	9.3 (0.13)
Norway (5)	1 ~	~	74 (3.8)	535 (3.3)	25 (3.8)	523 (4.8)	9.3 (0.10)
Oman	24 (2.8)	455 (7.4)	58 (3.3)	426 (6.2)	17 (2.7)	419 (9.2)	10.4 (0.13)
Poland	25 (3.8)	546 (4.6)	72 (3.9)	552 (2.7)	3 (1.3)	544 (16.3)	10.9 (0.10)
Portugal	7 (2.1)	513 (10.1)	60 (4.0)	510 (3.2)	33 (3.5)	511 (3.8)	9.3 (0.13)
Qatar	53 (3.2)	488 (6.2)	36 (3.0)	450 (5.9)	11 (2.4)	459 (13.5)	11.3 (0.15)
Romania	57 (5.7)	533 (8.6)	31 (5.4)	528 (6.9)	12 (4.0)	508 (20.3)	11.5 (0.27)
Saudi Arabia	29 (3.2)	435 (7.7)	50 (3.6)	426 (5.9)	21 (2.9)	421 (9.8)	10.3 (0.14)
Serbia	2 ~	~	87 (2.8)	511 (3.4)	11 (2.6)	493 (8.4)	9.7 (0.09)
Singapore	82 (0.0)	611 (3.0)	18 (0.0)	590 (6.3)	1 ~	~	12.6 (0.00)
Slovak Republic	3 (1.4)	538 (10.8)	62 (3.6)	535 (3.3)	35 (3.6)	494 (8.8)	8.9 (0.12)
Slovenia	1 ~	~	55 (4.2)	523 (2.6)	44 (4.1)	527 (3.6)	8.8 (0.10)
South Africa (5)	17 (3.4)	344 (27.8)	68 (4.2)	294 (8.0)	16 (2.9)	299 (18.9)	10.2 (0.12)
Spain	50 (2.6)	514 (2.9)	48 (2.6)	496 (2.8)	2 ~	~	11.6 (0.07)
Sweden	46 (4.6)	544 (3.7)	50 (4.5)	522 (6.1)	5 (1.8)	509 (22.3)	11.2 (0.16)
Türkiye (5)	27 (3.9)	574 (9.6)	45 (4.1)	573 (6.0)	28 (3.9)	565 (6.6)	10.1 (0.20)
United Arab Emirates	56 (0.9)	536 (2.4)	35 (1.0)	447 (3.8)	9 (0.3)	410 (4.9)	11.6 (0.03)
United States	34 (3.2)	556 (5.1)	46 (3.4)	521 (4.0)	19 (2.6)	515 (7.2)	10.6 (0.15)
Uzbekistan	27 (3.5)	420 (6.8)	70 (3.6)	408 (4.0)	3 (1.0)	424 (11.1)	10.8 (0.12)
International Average	24 (0.4)	504 (1.3)	56 (0.5)	493 (0.7)	20 (0.4)	471 (1.7)	
Benchmarking Participants							
Ontario, Canada	32 (3.9)	534 (6.9)	62 (4.3)	522 (3.8)	6 (2.4)	536 (14.2)	10.9 (0.14)
Quebec, Canada	8 (2.7)	522 (7.5)	80 (3.3)	509 (3.5)	11 (3.0)	501 (5.8)	10.1 (0.15)
Abu Dhabi, UAE	43 (1.9)	498 (4.9)	43 (2.1)	403 (5.3)	14 (0.9)	379 (7.6)	10.9 (0.05)
Dubai, UAE	79 (0.2)	580 (2.1)	18 (0.2)	499 (3.9)	3 (0.0)	469 (17.6)	12.6 (0.01)
Sharjah, UAE	54 (2.8)	528 (6.1)	35 (2.7)	479 (7.1)	10 (0.3)	449 (5.2)	11.6 (0.09)

This TIMSS context questionnaire scale was established in 2015 based on the combined response distribution of countries that participated in TIMSS 2015. To provide a point of reference for country comparisons, the scale centerpoint of 10 was located at the mean of the combined distribution. The units of the scale were chosen so that 2 scale score points corresponded to the standard deviation of the distribution.

() Standard errors appear in parentheses. Because of rounding some results may appear inconsistent.

An "r" indicates data are available for at least 70% but less than 85% of the students.

An "s" indicates data are available for at least 50% but less than 70% of the students.

A tilde (~) indicates insufficient data to report result.

SOURCE: IEA's Trends in International Mathematics and Science Study - TIMSS 2023
Downloaded from <https://timss2023.org/results>

School Climate and Safety

School Emphasis on Academic Success – Principals’ Reports

The TIMSS 2023 *School Emphasis on Academic Success* scale (Exhibit 4.2.1) includes items that asked school principals of fourth- and eighth-grade students about their perceptions of how different school community members exhibit support for academic achievement. Based on these responses, students were classified as attending schools with “very high,” “high,” or “medium” emphasis on academic success. These categories reflect the generally very positive responses that principals gave when characterizing their school communities. For both grades, there is considerable variation in the percentages of students in these categories across countries and some countries have very few students classified as attending schools with “very high emphasis” on academic success. Sixteen fourth-grade countries and ten eighth-grade countries have fewer than three percent of their students classified as attending schools with “very high emphasis” on academic success.

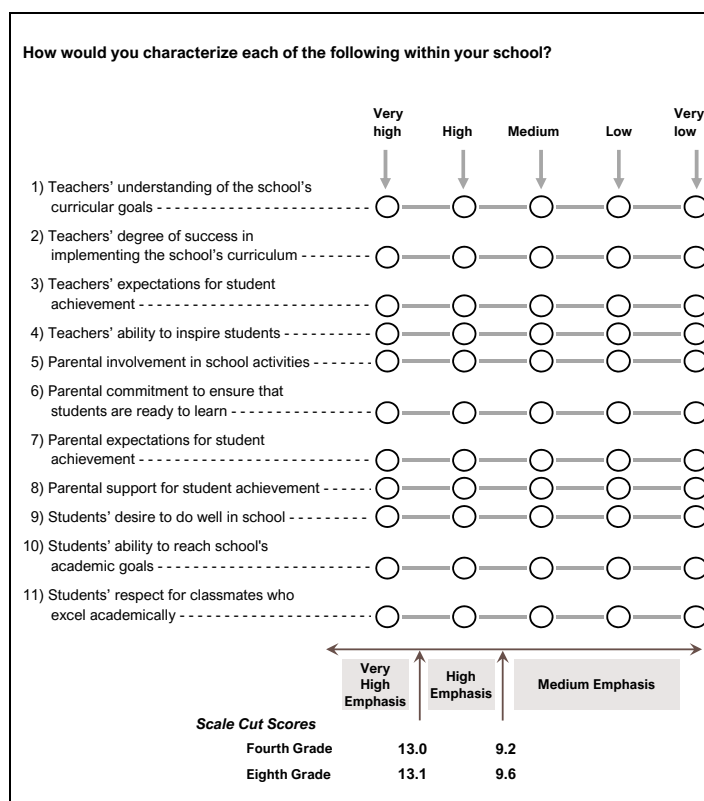
Across countries, on average, slightly more than half of fourth-grade students (54%) attended schools where the principal reported a “high emphasis” on academic success. Only nine percent attended schools with a “very high emphasis” and 37 percent attended schools with a “medium emphasis.” In both subjects at fourth grade, there is a positive relationship between school emphasis on academic success and average achievement internationally, however, it should be kept in mind that many countries have relatively few students classified as attending schools with a “very high emphasis” on academic success. In fourth-grade mathematics, students in schools with “very high emphasis” on academic success had an average achievement of 526, students in schools with “high emphasis” had an average achievement of 510, and students in schools with “medium emphasis” had an average achievement of 487 (Exhibit 4.2.2). Exhibit 4.2.3 shows similar results for fourth-grade science with an average achievement of 517 for students in schools with “very high emphasis,” 501 for those in schools with “high emphasis,” and 478 for those in schools with “medium emphasis.”

At the eighth grade, roughly half of students (49%) attended schools where principals reported “high emphasis” on academic success, while 10 percent attended schools with “very high emphasis,” and 41 percent attended schools with “medium emphasis.” In mathematics (Exhibit 4.2.4), students attending schools with a “very high emphasis” on academic success had an average achievement of 515, compared to 483 for “high emphasis” and 454 for “medium emphasis”. The results are similar for science (Exhibit 4.2.5), where students had an average achievement of 511 (“very high emphasis”), 481 (“high emphasis”), and 453 (“medium emphasis”).

Exhibit 4.2.1: School Emphasis on Academic Success – Principals' Reports

About the Scale

Students were scored according to their principals' responses characterizing eleven aspects on the *School Emphasis on Academic Success* scale. Cut scores divide the scale into three categories. Students in schools with a **Very High Emphasis** on academic success had a score at or above the cut score corresponding to their principals characterizing six of the eleven aspects as "very high" and the other five as "high," on average. Students in schools with a **Medium Emphasis** on academic success had a score at or below the cut score corresponding to their principals characterizing six of the eleven aspects as "medium" and the other five as "high," on average. All other students attended schools with a **High Emphasis** on academic success.



SOURCE: IEA's Trends in International Mathematics and Science Study - TIMSS 2023
Downloaded from <https://timss2023.org/results>

Exhibit 4.2.2: School Emphasis on Academic Success – Principals' Reports

Country	Very High Emphasis		High Emphasis		Medium Emphasis		Average Scale Score
	Percent of Students	Average Achievement	Percent of Students	Average Achievement	Percent of Students	Average Achievement	
Albania	12 (3.6)	534 (11.6)	56 (6.0)	512 (6.4)	32 (5.7)	501 (9.0)	10.6 (0.22)
Armenia	3 (1.5)	519 (18.0)	63 (4.6)	514 (3.6)	34 (4.4)	510 (5.4)	9.9 (0.14)
Australia	10 (2.3)	564 (13.0)	63 (3.4)	541 (3.0)	27 (3.2)	484 (6.3)	10.6 (0.15)
Azerbaijan	7 (2.1)	507 (13.4)	46 (4.0)	494 (6.3)	48 (3.8)	491 (5.2)	9.6 (0.18)
Bahrain	35 (2.7)	472 (9.0)	57 (2.6)	453 (5.0)	8 (1.7)	473 (12.1)	12.3 (0.14)
Belgium (Flemish)	0 ~	~ ~	48 (4.3)	533 (2.8)	52 (4.3)	513 (4.9)	9.2 (0.11)
Belgium (French)	18 (3.4)	491 (8.7)	59 (3.7)	495 (3.3)	23 (3.6)	471 (5.9)	11.1 (0.19)
Bosnia & Herzegovina	r 4 (2.3)	472 (29.0)	59 (5.6)	456 (4.6)	37 (5.9)	437 (7.0)	9.8 (0.19)
Brazil	5 (1.9)	469 (26.1)	35 (2.9)	416 (7.1)	60 (3.2)	386 (4.5)	9.0 (0.16)
Bulgaria	10 (2.3)	584 (11.0)	55 (4.0)	546 (4.9)	36 (3.6)	491 (7.7)	10.3 (0.16)
Canada	11 (1.5)	548 (6.6)	55 (2.6)	504 (2.5)	34 (2.5)	492 (3.5)	10.4 (0.10)
Chile	r 6 (2.1)	461 (16.7)	49 (5.1)	456 (4.8)	45 (4.9)	434 (5.1)	9.6 (0.18)
Chinese Taipei	15 (2.6)	626 (3.9)	70 (3.5)	606 (2.1)	15 (2.5)	594 (4.4)	11.2 (0.12)
Cyprus	9 (2.1)	543 (6.6)	55 (3.5)	521 (2.9)	36 (3.5)	502 (5.2)	10.3 (0.15)
Czech Republic	1 ~	~ ~	37 (3.6)	540 (3.9)	62 (3.6)	523 (2.6)	9.2 (0.10)
Denmark	4 (1.7)	525 (13.2)	57 (4.5)	529 (3.4)	39 (4.4)	519 (3.1)	9.9 (0.13)
England	r 10 (2.8)	604 (10.3)	60 (5.0)	555 (3.6)	30 (4.4)	535 (5.8)	10.3 (0.19)
Finland	3 (1.6)	550 (27.4)	57 (4.4)	536 (3.2)	40 (4.2)	516 (3.8)	9.9 (0.13)
France	2 ~	~ ~	53 (4.8)	493 (4.2)	45 (4.8)	469 (4.8)	9.6 (0.14)
Georgia	6 (1.6)	507 (13.3)	57 (4.0)	508 (4.5)	37 (3.9)	481 (4.6)	10.0 (0.13)
Germany	0 ~	~ ~	47 (3.1)	541 (2.6)	53 (3.1)	513 (3.8)	9.4 (0.09)
Hong Kong SAR	r 9 (3.0)	623 (11.4)	54 (4.9)	610 (7.5)	37 (4.6)	575 (7.8)	10.0 (0.17)
Hungary	2 ~	~ ~	40 (4.4)	549 (4.0)	58 (4.3)	497 (6.7)	9.2 (0.12)
Iran, Islamic Rep. of	10 (2.4)	438 (11.5)	58 (3.7)	428 (4.9)	31 (3.7)	396 (7.7)	10.3 (0.18)
Ireland	17 (3.2)	565 (4.6)	70 (4.0)	546 (3.2)	13 (3.0)	524 (7.8)	11.2 (0.19)
Italy	2 ~	~ ~	31 (3.9)	521 (5.3)	67 (4.1)	510 (3.6)	8.8 (0.14)
Japan	2 ~	~ ~	40 (4.3)	596 (3.5)	58 (4.1)	586 (2.9)	9.1 (0.13)
Jordan	8 (3.0)	417 (16.0)	49 (4.3)	439 (7.4)	43 (3.9)	415 (8.2)	10.1 (0.21)
Kazakhstan	14 (2.6)	498 (12.4)	66 (3.7)	485 (4.6)	20 (3.2)	486 (5.6)	11.2 (0.15)
Korea, Rep. of	23 (4.0)	611 (4.9)	60 (4.6)	593 (4.0)	17 (3.5)	577 (5.5)	11.5 (0.22)
Kosovo	r 6 (1.8)	462 (11.8)	63 (4.2)	459 (4.1)	31 (3.9)	428 (7.9)	10.3 (0.13)
Kuwait	11 (2.4)	420 (20.6)	64 (3.6)	385 (5.9)	25 (3.4)	350 (10.6)	10.7 (0.17)
Latvia	2 ~	~ ~	50 (4.0)	533 (4.4)	49 (4.0)	534 (3.1)	9.5 (0.09)
Lithuania	7 (2.0)	574 (7.2)	67 (3.8)	563 (3.9)	26 (3.3)	552 (6.4)	10.4 (0.11)
Macao SAR	5 (0.0)	629 (3.0)	57 (0.1)	589 (1.3)	37 (0.1)	565 (1.8)	9.9 (0.00)
Montenegro	6 (0.2)	490 (10.8)	58 (0.6)	478 (2.3)	37 (0.5)	477 (3.0)	9.9 (0.02)
Morocco	2 ~	~ ~	41 (3.8)	410 (7.2)	57 (3.6)	380 (7.0)	8.9 (0.13)
Netherlands	s 0 ~	~ ~	43 (5.5)	550 (4.2)	57 (5.5)	527 (4.2)	9.1 (0.18)
New Zealand	r 12 (3.1)	523 (14.4)	69 (4.6)	499 (3.7)	19 (3.6)	450 (9.5)	10.9 (0.19)
North Macedonia	10 (2.3)	469 (12.4)	49 (3.7)	485 (5.0)	41 (3.9)	465 (5.4)	10.0 (0.19)
Norway (5)	r 1 ~	~ ~	50 (4.8)	539 (2.5)	49 (4.7)	525 (3.6)	9.5 (0.13)
Oman	18 (2.6)	430 (10.8)	70 (3.0)	421 (4.7)	12 (2.1)	403 (12.0)	11.5 (0.13)
Poland	7 (2.3)	553 (7.2)	51 (4.4)	551 (3.2)	42 (4.1)	538 (3.2)	10.0 (0.15)
Portugal	2 ~	~ ~	53 (3.9)	524 (3.9)	46 (3.8)	508 (4.6)	9.5 (0.11)
Qatar	37 (3.1)	478 (6.3)	55 (2.9)	455 (4.8)	8 (2.0)	443 (12.9)	12.3 (0.17)
Romania	s 6 (2.8)	590 (11.4)	63 (6.0)	554 (8.0)	31 (5.7)	515 (10.4)	10.3 (0.21)
Saudi Arabia	30 (3.1)	441 (7.2)	60 (3.2)	416 (5.1)	10 (1.9)	388 (12.5)	11.9 (0.14)
Serbia	2 ~	~ ~	64 (3.6)	529 (4.8)	33 (3.5)	513 (4.8)	9.9 (0.11)
Singapore	14 (0.0)	643 (7.1)	62 (0.0)	618 (3.7)	24 (0.0)	590 (5.4)	10.9 (0.00)
Slovak Republic	1 ~	~ ~	43 (3.9)	530 (3.6)	56 (4.0)	503 (4.7)	9.1 (0.13)
Slovenia	0 ~	~ ~	49 (4.9)	516 (2.8)	51 (4.9)	511 (2.6)	9.3 (0.12)
South Africa (5)	r 2 ~	~ ~	37 (3.9)	376 (9.4)	61 (3.8)	344 (4.8)	9.0 (0.16)
Spain	6 (1.4)	522 (7.2)	57 (3.0)	506 (2.8)	37 (2.9)	483 (3.6)	9.9 (0.10)
Sweden	8 (2.5)	554 (7.6)	55 (4.2)	539 (3.3)	37 (4.1)	509 (5.4)	10.2 (0.16)
Türkiye (5)	13 (3.1)	608 (8.5)	42 (4.6)	566 (6.8)	45 (4.3)	525 (5.1)	10.0 (0.19)
United Arab Emirates	30 (1.1)	548 (2.3)	54 (1.3)	492 (1.8)	16 (0.9)	417 (3.8)	11.8 (0.06)
United States	13 (2.2)	563 (6.3)	49 (3.4)	530 (4.6)	38 (3.4)	484 (4.8)	10.1 (0.16)
Uzbekistan	10 (2.5)	456 (9.1)	70 (3.8)	444 (3.7)	19 (3.1)	434 (7.2)	10.9 (0.15)
International Average	9 (0.3)	526 (2.0)	54 (0.5)	510 (0.6)	37 (0.5)	487 (0.8)	
Benchmarking Participants							
Ontario, Canada	r 10 (2.0)	536 (12.6)	48 (4.3)	501 (4.7)	42 (4.3)	501 (5.3)	10.1 (0.17)
Quebec, Canada	11 (3.3)	544 (8.5)	64 (4.3)	519 (2.9)	25 (4.0)	498 (6.2)	10.5 (0.19)
Abu Dhabi, UAE	r 19 (1.4)	508 (4.5)	52 (2.3)	468 (3.5)	29 (2.2)	394 (4.0)	10.8 (0.12)
Dubai, UAE	44 (0.2)	587 (1.8)	48 (0.2)	539 (2.7)	8 (0.1)	477 (5.4)	12.8 (0.01)
Sharjah, UAE	r 36 (4.7)	535 (5.7)	56 (4.8)	495 (4.5)	8 (1.9)	447 (11.5)	12.4 (0.18)

This TIMSS context questionnaire scale was established in 2015 based on the combined response distribution of countries that participated in TIMSS 2015. To provide a point of reference for country comparisons, the scale centerpoint of 10 was located at the mean of the combined distribution. The units of the scale were chosen so that 2 scale score points corresponded to the standard deviation of the distribution.

() Standard errors appear in parentheses. Because of rounding some results may appear inconsistent.

An "r" indicates data are available for at least 70% but less than 85% of the students.

An "s" indicates data are available for at least 50% but less than 70% of the students.

A tilde (~) indicates insufficient data to report result.

SOURCE: IEA's Trends in International Mathematics and Science Study - TIMSS 2023
Downloaded from <https://timss2023.org/results>

Exhibit 4.2.3: School Emphasis on Academic Success – Principals' Reports

Country	Very High Emphasis		High Emphasis		Medium Emphasis		Average Scale Score
	Percent of Students	Average Achievement	Percent of Students	Average Achievement	Percent of Students	Average Achievement	
Albania	12 (3.6)	511 (12.4)	56 (6.0)	492 (5.8)	32 (5.7)	481 (8.5)	10.6 (0.22)
Armenia	3 (1.5)	463 (14.8)	63 (4.6)	458 (3.6)	34 (4.4)	455 (4.7)	9.9 (0.14)
Australia	10 (2.3)	575 (8.9)	63 (3.4)	562 (2.9)	27 (3.2)	518 (5.5)	10.6 (0.15)
Azerbaijan	7 (2.1)	429 (10.7)	46 (4.0)	420 (5.4)	48 (3.8)	420 (4.6)	9.6 (0.18)
Bahrain	35 (2.7)	492 (9.1)	57 (2.6)	465 (4.9)	8 (1.7)	467 (11.1)	12.3 (0.14)
Belgium (Flemish)	0 ~	~ ~	48 (4.3)	503 (3.1)	52 (4.3)	479 (5.4)	9.2 (0.11)
Belgium (French)	18 (3.4)	484 (9.1)	59 (3.7)	485 (3.7)	23 (3.6)	464 (6.2)	11.1 (0.19)
Bosnia & Herzegovina	r 4 (2.3)	471 (26.0)	59 (5.6)	456 (4.0)	37 (5.9)	441 (6.8)	9.8 (0.19)
Brazil	5 (1.9)	495 (24.5)	35 (2.9)	444 (6.6)	60 (3.2)	409 (5.0)	9.0 (0.16)
Bulgaria	10 (2.3)	588 (13.2)	55 (4.0)	549 (6.3)	36 (3.6)	484 (10.5)	10.3 (0.16)
Canada	11 (1.5)	558 (6.5)	55 (2.6)	521 (2.4)	34 (2.5)	514 (3.4)	10.4 (0.10)
Chile	r 6 (2.1)	493 (17.4)	49 (5.1)	491 (4.4)	45 (4.9)	470 (4.5)	9.6 (0.18)
Chinese Taipei	15 (2.6)	593 (3.9)	70 (3.5)	571 (2.0)	15 (2.5)	560 (4.5)	11.2 (0.12)
Cyprus	9 (2.1)	523 (9.4)	55 (3.5)	493 (3.5)	36 (3.5)	469 (6.1)	10.3 (0.15)
Czech Republic	1 ~	~ ~	37 (3.6)	534 (4.0)	62 (3.6)	519 (2.7)	9.2 (0.10)
Denmark	4 (1.7)	528 (13.7)	57 (4.5)	528 (4.0)	39 (4.4)	518 (3.6)	9.9 (0.13)
England	r 10 (2.8)	598 (8.1)	60 (5.0)	559 (3.7)	30 (4.4)	542 (4.8)	10.3 (0.19)
Finland	3 (1.6)	562 (25.2)	57 (4.4)	550 (3.4)	40 (4.2)	527 (4.6)	9.9 (0.13)
France	2 ~	~ ~	53 (4.8)	498 (3.9)	45 (4.8)	473 (5.3)	9.6 (0.14)
Georgia	6 (1.6)	474 (15.7)	57 (4.0)	474 (4.8)	37 (3.9)	449 (4.2)	10.0 (0.13)
Germany	0 ~	~ ~	47 (3.1)	536 (3.7)	53 (3.1)	502 (4.3)	9.4 (0.09)
Hong Kong SAR	r 9 (3.0)	570 (11.6)	54 (4.9)	561 (6.6)	37 (4.6)	524 (7.3)	10.0 (0.17)
Hungary	2 ~	~ ~	40 (4.4)	550 (3.6)	58 (4.3)	503 (5.9)	9.2 (0.12)
Iran, Islamic Rep. of	10 (2.4)	455 (12.2)	58 (3.7)	441 (5.3)	31 (3.7)	406 (8.1)	10.3 (0.18)
Ireland	17 (3.2)	551 (4.3)	70 (4.0)	531 (3.7)	13 (3.0)	515 (7.0)	11.2 (0.19)
Italy	2 ~	~ ~	31 (3.9)	518 (4.6)	67 (4.1)	508 (3.4)	8.8 (0.14)
Japan	2 ~	~ ~	40 (4.3)	560 (3.3)	58 (4.1)	550 (3.1)	9.1 (0.13)
Jordan	8 (3.0)	415 (15.9)	49 (4.3)	432 (6.9)	43 (3.9)	402 (7.9)	10.1 (0.21)
Kazakhstan	14 (2.6)	473 (12.8)	66 (3.7)	459 (4.8)	20 (3.2)	488 (6.6)	11.2 (0.15)
Korea, Rep. of	23 (4.0)	598 (5.0)	60 (4.6)	581 (3.8)	17 (3.5)	570 (5.0)	11.5 (0.22)
Kosovo	r 6 (1.8)	416 (13.6)	63 (4.2)	409 (4.3)	31 (3.9)	383 (7.3)	10.3 (0.13)
Kuwait	11 (2.4)	420 (24.5)	64 (3.6)	378 (7.2)	25 (3.4)	335 (12.0)	10.7 (0.17)
Latvia	2 ~	~ ~	50 (4.0)	523 (4.8)	49 (4.0)	527 (3.3)	9.5 (0.09)
Lithuania	7 (2.0)	549 (8.1)	67 (3.8)	540 (3.7)	26 (3.3)	527 (6.1)	10.4 (0.11)
Macao SAR	5 (0.0)	581 (3.6)	57 (0.1)	544 (1.7)	37 (0.1)	516 (2.1)	9.9 (0.00)
Montenegro	6 (0.2)	474 (12.1)	58 (0.6)	463 (2.3)	37 (0.5)	460 (2.9)	9.9 (0.02)
Morocco	2 ~	~ ~	41 (3.8)	408 (8.3)	57 (3.6)	377 (7.8)	8.9 (0.13)
Netherlands	s 0 ~	~ ~	43 (5.5)	530 (4.5)	57 (5.5)	506 (4.9)	9.1 (0.18)
New Zealand	r 12 (3.1)	543 (14.4)	69 (4.6)	526 (3.9)	19 (3.6)	477 (9.6)	10.9 (0.19)
North Macedonia	10 (2.3)	429 (13.5)	49 (3.7)	453 (5.2)	41 (3.9)	430 (6.4)	10.0 (0.19)
Norway (5)	r 1 ~	~ ~	50 (4.8)	539 (3.3)	49 (4.7)	525 (4.0)	9.5 (0.13)
Oman	18 (2.6)	445 (11.9)	70 (3.0)	432 (4.8)	12 (2.1)	410 (10.9)	11.5 (0.13)
Poland	7 (2.3)	555 (7.6)	51 (4.4)	556 (3.5)	42 (4.1)	542 (3.2)	10.0 (0.15)
Portugal	2 ~	~ ~	53 (3.9)	516 (3.4)	46 (3.8)	503 (3.6)	9.5 (0.11)
Qatar	37 (3.1)	491 (6.8)	55 (2.9)	462 (5.0)	8 (2.0)	441 (10.9)	12.3 (0.17)
Romania	s 6 (2.8)	571 (13.0)	63 (6.0)	536 (7.7)	31 (5.7)	504 (10.3)	10.3 (0.21)
Saudi Arabia	30 (3.1)	453 (7.6)	60 (3.2)	422 (4.6)	10 (1.9)	392 (12.8)	11.9 (0.14)
Serbia	2 ~	~ ~	64 (3.6)	515 (4.5)	33 (3.5)	501 (4.4)	9.9 (0.11)
Singapore	14 (0.0)	634 (5.9)	62 (0.0)	610 (3.5)	24 (0.0)	584 (4.9)	10.9 (0.00)
Slovak Republic	1 ~	~ ~	43 (3.9)	538 (3.8)	56 (4.0)	507 (5.4)	9.1 (0.13)
Slovenia	0 ~	~ ~	49 (4.9)	527 (3.3)	51 (4.9)	523 (2.9)	9.3 (0.12)
South Africa (5)	r 2 ~	~ ~	37 (3.9)	326 (12.9)	61 (3.8)	285 (6.9)	9.0 (0.16)
Spain	6 (1.4)	526 (7.3)	57 (3.0)	512 (2.6)	37 (2.9)	490 (3.5)	9.9 (0.10)
Sweden	8 (2.5)	559 (7.4)	55 (4.2)	544 (3.7)	37 (4.1)	508 (6.8)	10.2 (0.16)
Türkiye (5)	13 (3.1)	613 (6.7)	42 (4.6)	580 (5.6)	45 (4.3)	547 (4.6)	10.0 (0.19)
United Arab Emirates	30 (1.1)	552 (2.9)	54 (1.3)	489 (2.3)	16 (0.9)	398 (4.5)	11.8 (0.06)
United States	13 (2.2)	574 (5.7)	49 (3.4)	544 (4.2)	38 (3.4)	502 (4.5)	10.1 (0.16)
Uzbekistan	10 (2.5)	425 (8.8)	70 (3.8)	412 (4.3)	19 (3.1)	404 (6.6)	10.9 (0.15)
International Average	9 (0.3)	517 (1.9)	54 (0.5)	501 (0.6)	37 (0.5)	478 (0.8)	
Benchmarking Participants							
Ontario, Canada	r 10 (2.0)	548 (12.2)	48 (4.3)	524 (4.4)	42 (4.3)	526 (4.8)	10.1 (0.17)
Quebec, Canada	11 (3.3)	533 (6.3)	64 (4.3)	511 (3.3)	25 (4.0)	495 (5.1)	10.5 (0.19)
Abu Dhabi, UAE	r 19 (1.4)	504 (4.7)	52 (2.3)	458 (5.0)	29 (2.2)	367 (4.5)	10.8 (0.12)
Dubai, UAE	44 (0.2)	596 (2.4)	48 (0.2)	544 (2.6)	8 (0.1)	477 (4.1)	12.8 (0.01)
Sharjah, UAE	r 36 (4.7)	537 (7.2)	56 (4.8)	490 (5.3)	8 (1.9)	438 (10.8)	12.4 (0.18)

This TIMSS context questionnaire scale was established in 2015 based on the combined response distribution of countries that participated in TIMSS 2015. To provide a point of reference for country comparisons, the scale centerpoint of 10 was located at the mean of the combined distribution. The units of the scale were chosen so that 2 scale score points corresponded to the standard deviation of the distribution.

() Standard errors appear in parentheses. Because of rounding some results may appear inconsistent.

An "r" indicates data are available for at least 70% but less than 85% of the students.

An "s" indicates data are available for at least 50% but less than 70% of the students.

A tilde (~) indicates insufficient data to report result.

SOURCE: IEA's Trends in International Mathematics and Science Study - TIMSS 2023
Downloaded from <https://timss2023.org/results>

Exhibit 4.2.4: School Emphasis on Academic Success – Principals' Reports

Country		Very High Emphasis		High Emphasis		Medium Emphasis		Average Scale Score
		Percent of Students	Average Achievement	Percent of Students	Average Achievement	Percent of Students	Average Achievement	
Australia	r	15 (2.5)	567 (6.3)	40 (4.2)	520 (4.7)	45 (3.7)	486 (6.6)	10.5 (0.17)
Austria		2 ~	~ ~	53 (3.9)	529 (4.0)	45 (4.0)	492 (5.1)	9.8 (0.11)
Azerbaijan		7 (1.9)	477 (18.2)	38 (3.8)	487 (6.4)	55 (3.9)	475 (5.6)	9.8 (0.16)
Bahrain		22 (0.7)	475 (5.2)	57 (0.9)	419 (3.1)	21 (0.6)	394 (6.0)	11.5 (0.03)
Brazil		2 ~	~ ~	28 (3.0)	405 (8.1)	70 (2.6)	363 (2.2)	8.8 (0.11)
Chile	r	3 (1.0)	445 (31.2)	39 (4.4)	432 (6.9)	58 (4.3)	406 (5.6)	9.5 (0.15)
Chinese Taipei		18 (2.7)	649 (6.3)	56 (3.3)	604 (4.9)	25 (2.5)	565 (4.5)	11.2 (0.12)
Cote d'Ivoire		0 ~	~ ~	21 (3.8)	295 (19.0)	79 (3.8)	255 (3.1)	8.4 (0.13)
Cyprus		14 (0.3)	523 (12.0)	52 (1.4)	508 (3.9)	34 (1.3)	461 (3.4)	10.9 (0.04)
Czech Republic		0 ~	~ ~	29 (3.2)	540 (4.9)	71 (3.2)	508 (3.2)	9.3 (0.07)
England	r	9 (2.2)	584 (12.3)	52 (5.0)	531 (7.2)	39 (4.9)	496 (10.5)	10.5 (0.16)
Finland		0 ~	~ ~	55 (3.6)	508 (3.4)	45 (3.6)	499 (4.0)	10.0 (0.09)
France		3 (1.5)	530 (17.7)	45 (4.2)	493 (5.6)	51 (4.2)	465 (4.0)	9.6 (0.14)
Georgia		6 (2.1)	466 (18.3)	51 (4.2)	475 (5.2)	43 (4.0)	457 (5.0)	10.0 (0.15)
Hong Kong SAR	s	14 (3.0)	643 (29.1)	45 (5.2)	595 (8.9)	41 (5.1)	555 (10.6)	10.3 (0.24)
Hungary		0 ~	~ ~	36 (3.5)	543 (5.2)	63 (3.5)	486 (4.7)	9.4 (0.10)
Iran, Islamic Rep. of		12 (2.0)	456 (13.8)	38 (3.3)	441 (6.4)	50 (3.1)	402 (4.5)	10.0 (0.15)
Ireland		14 (3.1)	550 (6.0)	68 (5.0)	526 (3.7)	18 (4.0)	488 (5.3)	11.3 (0.15)
Israel		5 (1.7)	534 (30.1)	57 (3.6)	503 (5.7)	38 (3.6)	460 (6.6)	10.3 (0.12)
Italy		1 ~	~ ~	25 (3.6)	509 (5.6)	74 (3.6)	499 (3.8)	8.9 (0.13)
Japan		4 (1.9)	608 (6.2)	45 (4.1)	605 (5.7)	51 (3.9)	585 (3.1)	9.8 (0.15)
Jordan		5 (1.8)	418 (16.1)	43 (3.6)	400 (5.8)	51 (3.5)	374 (4.7)	9.7 (0.16)
Kazakhstan		16 (2.8)	473 (10.4)	62 (3.7)	454 (5.4)	22 (3.3)	442 (8.3)	11.3 (0.16)
Korea, Rep. of		26 (3.5)	612 (5.7)	60 (4.0)	592 (4.1)	14 (2.8)	587 (5.8)	11.8 (0.17)
Kuwait		12 (2.9)	439 (23.9)	59 (3.9)	403 (6.5)	29 (3.8)	374 (11.3)	10.7 (0.19)
Lithuania		1 ~	~ ~	63 (3.6)	517 (4.2)	35 (3.7)	499 (5.5)	10.2 (0.10)
Malaysia		15 (2.7)	451 (8.3)	64 (3.4)	408 (4.4)	21 (2.8)	389 (6.7)	11.2 (0.13)
Malta		7 (0.1)	517 (5.0)	49 (0.1)	520 (1.8)	44 (0.1)	473 (1.6)	10.1 (0.00)
Morocco		2 ~	~ ~	23 (3.5)	388 (8.1)	75 (3.3)	372 (3.7)	8.7 (0.12)
Norway (9)	r	2 ~	~ ~	47 (4.3)	510 (2.8)	52 (4.3)	494 (3.7)	9.8 (0.12)
Oman		21 (2.8)	420 (7.1)	66 (3.1)	414 (3.3)	13 (2.4)	389 (8.2)	11.7 (0.14)
Palestinian Nat'l Auth.		3 (1.3)	415 (9.5)	47 (3.5)	396 (4.3)	49 (3.3)	366 (3.5)	9.8 (0.12)
Portugal		5 (1.9)	516 (17.0)	40 (3.7)	489 (4.0)	55 (3.8)	461 (3.8)	9.6 (0.14)
Qatar		33 (3.9)	473 (10.0)	54 (4.4)	434 (5.9)	13 (3.2)	460 (13.1)	12.1 (0.18)
Romania	s	9 (3.5)	536 (14.2)	66 (6.8)	499 (8.7)	26 (5.9)	483 (10.7)	10.7 (0.19)
Saudi Arabia		29 (3.0)	410 (6.7)	57 (3.6)	395 (4.5)	14 (2.7)	373 (9.9)	11.9 (0.15)
Singapore		16 (2.9)	664 (10.8)	63 (4.3)	610 (6.9)	21 (3.7)	546 (13.9)	11.2 (0.15)
South Africa (9)	r	3 (0.8)	517 (18.6)	31 (3.1)	402 (5.7)	66 (3.1)	387 (3.9)	9.1 (0.14)
Sweden		7 (2.2)	539 (10.4)	54 (4.2)	526 (3.2)	39 (3.9)	502 (5.0)	10.2 (0.15)
Türkiye		11 (2.6)	579 (19.3)	48 (4.5)	523 (6.4)	41 (4.4)	470 (6.4)	10.4 (0.19)
United Arab Emirates		28 (1.6)	532 (4.6)	55 (1.9)	484 (3.2)	17 (1.4)	428 (4.0)	12.0 (0.08)
United States		8 (2.2)	514 (14.8)	47 (3.7)	507 (6.6)	45 (3.6)	465 (5.4)	10.1 (0.16)
Uzbekistan		11 (2.6)	457 (20.4)	69 (4.1)	419 (4.5)	20 (3.7)	407 (8.2)	11.3 (0.17)
International Average		10 (0.3)	515 (2.7)	49 (0.6)	483 (0.9)	41 (0.5)	454 (1.0)	
Benchmarking Participants								
Abu Dhabi, UAE	r	19 (2.5)	500 (8.0)	54 (3.5)	455 (5.8)	27 (3.3)	411 (7.6)	11.2 (0.18)
Dubai, UAE		35 (1.9)	581 (4.2)	55 (2.5)	539 (5.1)	9 (1.6)	451 (6.7)	12.6 (0.09)
Sharjah, UAE		35 (5.4)	535 (12.6)	54 (5.3)	482 (6.9)	11 (2.5)	470 (8.2)	12.6 (0.23)

This TIMSS context questionnaire scale was established in 2015 based on the combined response distribution of countries that participated in TIMSS 2015. To provide a point of reference for country comparisons, the scale centerpoint of 10 was located at the mean of the combined distribution. The units of the scale were chosen so that 2 scale score points corresponded to the standard deviation of the distribution.

() Standard errors appear in parentheses. Because of rounding some results may appear inconsistent.

An "r" indicates data are available for at least 70% but less than 85% of the students.

An "s" indicates data are available for at least 50% but less than 70% of the students.

A tilde (~) indicates insufficient data to report result.

SOURCE: IEA's Trends in International Mathematics and Science Study - TIMSS 2023
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TIMSS & PIRLS
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Exhibit 4.2.5: School Emphasis on Academic Success – Principals' Reports

Country		Very High Emphasis		High Emphasis		Medium Emphasis		Average Scale Score
		Percent of Students	Average Achievement	Percent of Students	Average Achievement	Percent of Students	Average Achievement	
Australia	r	15 (2.5)	567 (6.1)	40 (4.2)	532 (4.3)	45 (3.7)	500 (5.9)	10.5 (0.17)
Austria		2 ~	~ ~	53 (3.9)	530 (4.5)	45 (4.0)	489 (5.4)	9.8 (0.11)
Azerbaijan		7 (1.9)	400 (13.1)	38 (3.8)	417 (5.8)	55 (3.9)	411 (4.0)	9.8 (0.16)
Bahrain		22 (0.7)	502 (4.6)	57 (0.9)	448 (3.3)	21 (0.6)	407 (6.4)	11.5 (0.03)
Brazil		2 ~	~ ~	28 (3.0)	444 (7.1)	70 (2.6)	406 (2.1)	8.8 (0.11)
Chile	r	3 (1.0)	473 (24.5)	39 (4.4)	470 (6.3)	58 (4.3)	446 (4.8)	9.5 (0.15)
Chinese Taipei		18 (2.7)	612 (5.4)	56 (3.3)	572 (3.8)	25 (2.5)	542 (4.0)	11.2 (0.12)
Cote d'Ivoire		0 ~	~ ~	21 (3.8)	238 (31.3)	79 (3.8)	169 (5.5)	8.4 (0.13)
Cyprus		14 (0.3)	487 (9.7)	52 (1.4)	479 (4.7)	34 (1.3)	432 (3.7)	10.9 (0.04)
Czech Republic		0 ~	~ ~	29 (3.2)	546 (3.8)	71 (3.2)	519 (2.8)	9.3 (0.07)
England	r	9 (2.2)	588 (10.7)	52 (5.0)	537 (6.5)	39 (4.9)	503 (9.4)	10.5 (0.16)
Finland		0 ~	~ ~	55 (3.6)	536 (3.8)	45 (3.6)	525 (4.9)	10.0 (0.09)
France		3 (1.5)	531 (17.6)	45 (4.2)	499 (5.4)	51 (4.2)	474 (4.1)	9.6 (0.14)
Georgia		6 (2.1)	446 (13.8)	51 (4.2)	455 (4.7)	43 (4.0)	439 (3.9)	10.0 (0.15)
Hong Kong SAR	s	14 (3.0)	582 (28.4)	45 (5.2)	541 (8.3)	41 (5.1)	512 (8.2)	10.3 (0.24)
Hungary		0 ~	~ ~	36 (3.5)	552 (4.5)	63 (3.5)	505 (4.2)	9.4 (0.10)
Iran, Islamic Rep. of		12 (2.0)	446 (14.4)	38 (3.3)	436 (6.3)	50 (3.1)	400 (4.6)	10.0 (0.15)
Ireland		14 (3.1)	548 (8.0)	68 (5.0)	529 (4.0)	18 (4.0)	498 (6.0)	11.3 (0.15)
Israel		5 (1.7)	528 (27.8)	57 (3.6)	494 (5.3)	38 (3.6)	457 (6.0)	10.3 (0.12)
Italy		1 ~	~ ~	25 (3.6)	509 (5.5)	74 (3.6)	499 (4.0)	8.9 (0.13)
Japan		4 (1.9)	564 (6.4)	45 (4.1)	564 (5.6)	51 (3.9)	550 (2.9)	9.8 (0.15)
Jordan		5 (1.8)	447 (15.8)	43 (3.6)	425 (6.9)	51 (3.5)	398 (4.9)	9.7 (0.16)
Kazakhstan		16 (2.8)	448 (7.5)	62 (3.7)	441 (4.7)	22 (3.3)	445 (7.5)	11.3 (0.16)
Korea, Rep. of		26 (3.5)	557 (4.6)	60 (4.0)	542 (3.3)	14 (2.8)	542 (4.3)	11.8 (0.17)
Kuwait		12 (2.9)	463 (24.1)	59 (3.9)	425 (6.8)	29 (3.8)	391 (11.2)	10.7 (0.19)
Lithuania		1 ~	~ ~	63 (3.6)	522 (3.9)	35 (3.7)	508 (5.0)	10.2 (0.10)
Malaysia		15 (2.7)	464 (8.6)	64 (3.4)	426 (4.9)	21 (2.8)	402 (6.8)	11.2 (0.13)
Malta		7 (0.1)	518 (6.4)	49 (0.1)	525 (2.2)	44 (0.1)	471 (2.4)	10.1 (0.00)
Morocco		2 ~	~ ~	23 (3.5)	334 (9.3)	75 (3.3)	322 (4.2)	8.7 (0.12)
Norway (9)	r	2 ~	~ ~	47 (4.3)	498 (3.0)	52 (4.3)	482 (4.3)	9.8 (0.12)
Oman		21 (2.8)	467 (7.1)	66 (3.1)	459 (3.4)	13 (2.4)	425 (6.6)	11.7 (0.14)
Palestinian Nat'l Auth.		3 (1.3)	434 (10.3)	47 (3.5)	408 (4.2)	49 (3.3)	376 (3.6)	9.8 (0.12)
Portugal		5 (1.9)	539 (16.2)	40 (3.7)	517 (3.3)	55 (3.8)	493 (3.4)	9.6 (0.14)
Qatar		33 (3.9)	503 (9.3)	54 (4.4)	466 (5.7)	13 (3.2)	488 (11.0)	12.1 (0.18)
Romania	s	9 (3.5)	497 (11.1)	66 (6.8)	469 (7.0)	26 (5.9)	458 (7.7)	10.7 (0.19)
Saudi Arabia		29 (3.0)	431 (7.0)	57 (3.6)	418 (4.9)	14 (2.7)	396 (10.2)	11.9 (0.15)
Singapore		16 (2.9)	663 (11.0)	63 (4.3)	611 (6.6)	21 (3.7)	547 (13.4)	11.2 (0.15)
South Africa (9)	r	3 (0.8)	531 (24.7)	31 (3.1)	369 (7.3)	66 (3.1)	352 (5.6)	9.1 (0.14)
Sweden		7 (2.2)	551 (13.3)	54 (4.2)	531 (3.8)	39 (3.9)	502 (6.2)	10.2 (0.15)
Türkiye		11 (2.6)	583 (15.4)	48 (4.5)	542 (5.3)	41 (4.4)	499 (5.2)	10.4 (0.19)
United Arab Emirates		28 (1.6)	534 (5.3)	55 (1.9)	484 (3.7)	17 (1.4)	414 (5.3)	12.0 (0.08)
United States		8 (2.2)	533 (13.8)	47 (3.7)	531 (6.1)	45 (3.6)	493 (5.2)	10.1 (0.16)
Uzbekistan		11 (2.6)	427 (13.6)	69 (4.1)	393 (3.9)	20 (3.7)	388 (6.6)	11.3 (0.17)
International Average		10 (0.3)	511 (2.5)	49 (0.6)	481 (1.1)	41 (0.5)	453 (0.9)	
Benchmarking Participants								
Abu Dhabi, UAE	r	19 (2.5)	497 (9.9)	54 (3.5)	448 (7.4)	27 (3.3)	384 (10.1)	11.2 (0.18)
Dubai, UAE		35 (1.9)	583 (6.6)	55 (2.5)	542 (5.5)	9 (1.6)	450 (8.6)	12.6 (0.09)
Sharjah, UAE		35 (5.4)	541 (13.8)	54 (5.3)	486 (7.1)	11 (2.5)	471 (7.6)	12.6 (0.23)

This TIMSS context questionnaire scale was established in 2015 based on the combined response distribution of countries that participated in TIMSS 2015. To provide a point of reference for country comparisons, the scale centerpoint of 10 was located at the mean of the combined distribution. The units of the scale were chosen so that 2 scale score points corresponded to the standard deviation of the distribution.

() Standard errors appear in parentheses. Because of rounding some results may appear inconsistent.

An "r" indicates data are available for at least 70% but less than 85% of the students.

An "s" indicates data are available for at least 50% but less than 70% of the students.

A tilde (~) indicates insufficient data to report result.

SOURCE: IEA's Trends in International Mathematics and Science Study - TIMSS 2023
Downloaded from <https://timss2023.org/results>

School Discipline – Principals’ Reports

Attending schools with fewer discipline and safety problems is associated with higher average achievement in mathematics and science in both fourth and eighth grades internationally. The TIMSS 2023 *School Discipline* scale (Exhibit 4.2.6) includes items that asked school principals to report their perceptions about the degree to which various behaviors are problems among fourth- and eighth-grade students in their school. There were slight differences in this list of problems across grades. Based on their principals’ responses, students were classified as attending schools with “hardly any problems,” “minor problems,” or “moderate to severe problems.” In both grades, there is considerable variation in these categories across countries— especially in the percentages of students classified as attending schools with “moderate to severe problems.” In the fourth grade, 11 countries have less than 3 percent of students classified in this category, while eight countries have 20 percent of students or more classified in this category. A similar pattern emerges in eighth grade (6 countries and 8 countries, respectively).

On average internationally, the majority of fourth-grade students (58%) attended schools with “hardly any problems,” and 32 percent attended schools with “minor problems.” Only 10 percent of students, on average, attended schools for which principals reported “moderate to severe problems” with discipline and safety. Average achievement in both mathematics and science was higher internationally for fourth-grade students in schools with “hardly any problems” than for students in schools with “minor problems” or “moderate to severe problems.” As shown in Exhibit 4.2.7, average mathematics achievement for students in schools with “hardly any problems” was 13 points higher than those in schools with “minor problems” and 35 points higher than those in schools with “moderate to severe problems” (510 vs. 497 and 475, respectively). The results are similar for fourth-grade science (Exhibit 4.2.8). Students in schools with “hardly any problems” with discipline and safety had the highest average science achievement (502), while the average achievement of students in schools with “minor problems” was 14 points lower (488). Internationally, students in schools with “moderate to severe problems” had average science achievement 37 points lower (465) than students in schools with only “hardly any problems.”

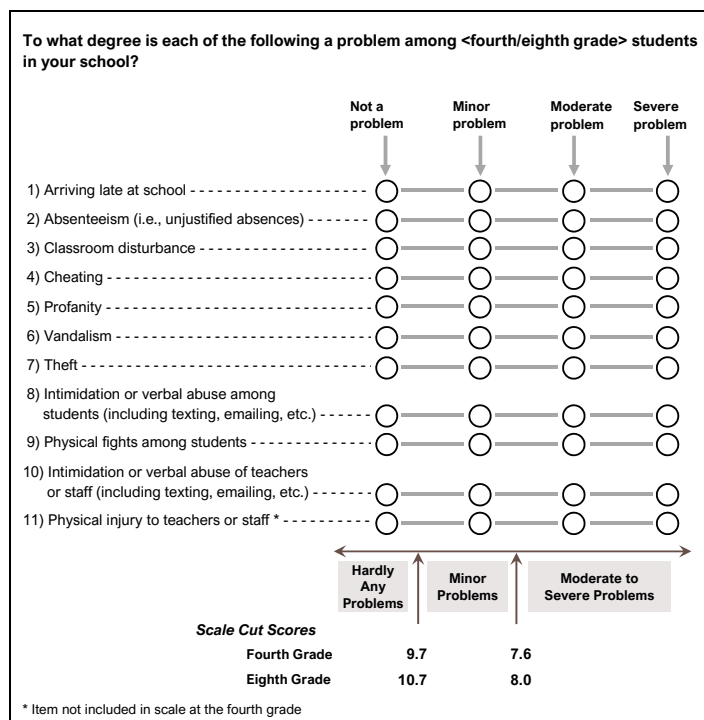
Less than half of eighth-grade students internationally attended schools with “hardly any problems” (41%). Forty-five percent of eighth-grade students attended schools with “minor problems” and 14% attended schools with “moderate to severe problems.” The 14 percent of eighth-grade students in the “moderate to severe problems” category had the lowest average achievement in both mathematics and science (Exhibits 4.2.9 and 4.2.10, respectively). In mathematics, there was a 42-point difference in average achievement between students in schools with “hardly any problems” and those in schools with “moderate to severe problems” (485 vs. 443). There was a 41-point

difference in average science achievement for students in these two groups (483 vs. 442). Average achievement for students in schools with “minor problems” was in between these extremes for both subjects (468 in mathematics and 466 in science).

Exhibit 4.2.6: School Discipline – Principals’ Reports

About the Scale

Students were scored according to their principals’ reports regarding eleven potential problems on the *School Discipline* scale. Cut scores divide the scale into three categories. Students in schools with **Hardly Any Problems** had a score at or above the cut score corresponding to their principals reporting that six of the eleven issues are “not a problem” and the other five are a “minor problem,” on average. Students in schools with **Moderate to Severe Problems** had a score at or below the cut score corresponding to their principals reporting that six of the eleven issues are a “moderate problem” and the other five are a “minor problem,” on average. All other students were in schools with **Minor Problems**.



SOURCE: IEA's Trends in International Mathematics and Science Study - TIMSS 2023
Downloaded from <https://timss2023.org/results>

Exhibit 4.2.7: School Discipline – Principals' Reports

Country	Hardly Any Problems		Minor Problems		Moderate to Severe Problems		Average Scale Score
	Percent of Students	Average Achievement	Percent of Students	Average Achievement	Percent of Students	Average Achievement	
Albania	90 (3.1)	508 (5.2)	8 (2.8)	549 (17.0)	2 ~	~	11.1 (0.14)
Armenia	74 (4.2)	513 (3.3)	15 (3.3)	506 (7.2)	11 (2.9)	516 (7.1)	10.2 (0.20)
Australia	51 (4.2)	544 (4.7)	43 (4.3)	515 (5.5)	6 (1.9)	468 (14.9)	9.8 (0.11)
Azerbaijan	66 (3.9)	498 (4.7)	19 (3.2)	487 (9.6)	15 (2.6)	488 (13.8)	9.9 (0.16)
Bahrain	84 (2.1)	460 (4.7)	10 (1.9)	475 (11.1)	6 (0.9)	456 (16.5)	11.1 (0.09)
Belgium (Flemish)	58 (4.4)	535 (2.7)	36 (4.4)	512 (4.2)	6 (2.1)	462 (15.1)	10.0 (0.14)
Belgium (French)	47 (3.6)	502 (4.0)	51 (3.6)	477 (3.9)	2 ~	~	9.6 (0.10)
Bosnia & Herzegovina	56 (6.6)	451 (5.3)	24 (6.0)	444 (10.4)	20 (5.2)	454 (5.8)	9.4 (0.29)
Brazil	51 (3.8)	412 (5.0)	38 (3.5)	384 (5.8)	11 (1.7)	411 (16.8)	9.6 (0.15)
Bulgaria	73 (3.4)	546 (3.1)	19 (2.7)	493 (11.3)	8 (2.4)	464 (30.4)	10.4 (0.15)
Canada	48 (2.6)	510 (3.0)	47 (2.6)	503 (3.0)	5 (1.1)	484 (8.5)	9.6 (0.08)
Chile	43 (4.1)	459 (5.4)	47 (4.2)	441 (4.6)	11 (2.4)	425 (10.5)	9.3 (0.12)
Chinese Taipei	79 (3.1)	608 (1.9)	21 (3.1)	602 (3.9)	1 ~	~	10.8 (0.10)
Cyprus	57 (3.5)	521 (3.3)	40 (3.5)	512 (4.1)	3 (0.7)	483 (25.2)	9.9 (0.10)
Czech Republic	68 (3.8)	532 (2.9)	29 (3.8)	526 (4.3)	3 (1.3)	512 (6.9)	10.1 (0.10)
Denmark	48 (4.5)	534 (3.3)	50 (4.5)	516 (3.2)	2 ~	~	9.6 (0.09)
England	75 (3.5)	561 (3.7)	24 (3.6)	534 (6.8)	1 ~	~	10.3 (0.11)
Finland	56 (3.9)	532 (3.2)	42 (3.8)	526 (4.7)	2 ~	~	9.7 (0.10)
France	58 (4.2)	493 (3.7)	38 (4.2)	468 (5.4)	4 (1.6)	460 (12.6)	10.0 (0.13)
Georgia	74 (3.4)	503 (3.8)	22 (3.3)	479 (5.3)	5 (1.6)	509 (18.5)	10.3 (0.13)
Germany	25 (3.0)	540 (3.4)	63 (3.4)	523 (3.3)	11 (2.2)	511 (8.8)	8.8 (0.08)
Hong Kong SAR	90 (2.7)	599 (5.4)	9 (2.9)	584 (13.1)	1 ~	~	11.1 (0.15)
Hungary	56 (3.9)	537 (4.8)	34 (3.9)	509 (7.5)	10 (2.4)	457 (19.7)	9.7 (0.11)
Iran, Islamic Rep. of	58 (3.5)	428 (5.2)	33 (3.3)	405 (8.7)	8 (1.9)	414 (14.7)	9.9 (0.12)
Ireland	85 (3.0)	552 (3.0)	14 (2.9)	517 (5.9)	1 ~	~	10.7 (0.11)
Italy	62 (4.2)	518 (3.7)	26 (3.7)	508 (5.4)	12 (2.8)	506 (13.2)	9.7 (0.15)
Japan	67 (3.8)	591 (2.5)	29 (4.1)	588 (4.1)	4 (1.4)	601 (17.4)	10.0 (0.09)
Jordan	37 (4.3)	441 (10.4)	30 (3.9)	419 (10.0)	33 (3.7)	417 (8.1)	8.4 (0.20)
Kazakhstan	83 (3.0)	490 (4.3)	8 (2.1)	472 (6.7)	9 (2.3)	469 (12.1)	10.9 (0.15)
Korea, Rep. of	63 (4.6)	601 (3.4)	29 (4.3)	588 (4.2)	9 (2.3)	571 (19.3)	10.1 (0.15)
Kosovo	41 (4.5)	451 (6.0)	35 (4.4)	456 (4.6)	24 (3.8)	439 (11.6)	8.9 (0.19)
Kuwait	41 (3.7)	388 (7.5)	39 (4.0)	385 (8.6)	20 (3.0)	353 (10.0)	9.0 (0.14)
Latvia	51 (3.9)	532 (3.8)	45 (4.0)	536 (3.9)	4 (1.6)	533 (13.9)	9.8 (0.11)
Lithuania	58 (3.8)	563 (3.6)	41 (3.7)	559 (5.3)	1 ~	~	10.0 (0.11)
Macao SAR	73 (0.1)	585 (1.2)	20 (0.1)	582 (2.4)	6 (0.0)	552 (3.4)	10.8 (0.00)
Montenegro	44 (0.6)	482 (3.1)	41 (0.6)	476 (2.6)	15 (0.5)	476 (4.0)	9.2 (0.03)
Morocco	25 (3.6)	426 (11.1)	26 (3.2)	400 (11.0)	50 (4.3)	377 (5.1)	7.7 (0.21)
Netherlands	69 (6.2)	541 (3.4)	26 (5.8)	530 (6.6)	4 (2.5)	500 (27.0)	10.7 (0.22)
New Zealand	65 (4.5)	503 (4.9)	31 (4.3)	477 (6.7)	4 (2.1)	444 (14.1)	10.0 (0.12)
North Macedonia	63 (3.2)	484 (4.4)	24 (3.0)	464 (9.3)	13 (2.5)	457 (7.8)	9.9 (0.16)
Norway (5)	34 (4.0)	543 (4.1)	56 (4.4)	529 (3.1)	10 (2.4)	512 (4.0)	9.2 (0.10)
Oman	39 (3.2)	426 (6.9)	35 (3.4)	418 (6.8)	27 (3.1)	413 (9.5)	8.8 (0.16)
Poland	44 (3.9)	550 (3.6)	48 (3.9)	542 (3.1)	8 (2.2)	552 (6.7)	9.4 (0.10)
Portugal	52 (4.0)	521 (4.0)	39 (3.8)	512 (5.7)	10 (2.4)	516 (8.1)	9.5 (0.15)
Qatar	69 (3.5)	463 (4.5)	23 (3.3)	464 (7.2)	8 (2.0)	457 (13.5)	10.3 (0.15)
Romania	74 (4.8)	549 (6.7)	22 (5.0)	525 (12.6)	4 (2.1)	568 (27.9)	10.5 (0.20)
Saudi Arabia	67 (3.4)	422 (4.9)	14 (2.5)	420 (13.5)	19 (2.5)	416 (10.4)	9.9 (0.16)
Serbia	64 (4.0)	518 (4.6)	34 (3.9)	532 (4.7)	2 ~	~	10.3 (0.12)
Singapore	77 (0.0)	617 (3.2)	23 (0.0)	604 (6.7)	0 ~	~	10.7 (0.00)
Slovak Republic	69 (3.6)	525 (3.0)	23 (3.5)	512 (7.9)	8 (2.0)	437 (21.6)	10.1 (0.13)
Slovenia	42 (4.0)	514 (3.0)	50 (4.2)	512 (2.4)	8 (2.4)	517 (6.2)	9.3 (0.10)
South Africa (5)	25 (3.2)	381 (12.0)	56 (3.5)	355 (7.0)	20 (2.6)	337 (9.6)	8.8 (0.09)
Spain	74 (2.7)	504 (2.4)	21 (2.4)	484 (4.6)	5 (1.4)	479 (9.9)	10.5 (0.10)
Sweden	35 (4.0)	542 (4.1)	60 (4.0)	522 (3.8)	5 (1.6)	519 (12.6)	9.3 (0.10)
Türkiye (5)	45 (4.4)	563 (6.0)	36 (4.3)	543 (7.8)	18 (3.6)	548 (14.2)	9.3 (0.18)
United Arab Emirates	71 (1.0)	512 (1.5)	22 (1.1)	457 (4.5)	7 (0.5)	463 (4.4)	10.3 (0.05)
United States	52 (3.8)	531 (4.6)	41 (3.7)	508 (5.7)	7 (1.8)	468 (12.3)	9.7 (0.10)
Uzbekistan	44 (4.2)	448 (5.0)	9 (2.6)	431 (10.7)	47 (4.3)	441 (4.0)	8.4 (0.27)
International Average	58 (0.5)	510 (0.6)	32 (0.5)	497 (1.0)	10 (0.3)	475 (2.1)	
Benchmarking Participants							
Ontario, Canada	50 (4.3)	506 (4.8)	48 (4.3)	505 (5.1)	2 ~	~	9.7 (0.12)
Quebec, Canada	35 (4.3)	520 (5.2)	55 (4.8)	516 (4.1)	10 (3.1)	503 (7.3)	9.2 (0.14)
Abu Dhabi, UAE	67 (2.5)	469 (2.5)	26 (2.5)	424 (7.9)	7 (1.1)	427 (9.8)	10.0 (0.11)
Dubai, UAE	81 (0.1)	563 (1.7)	15 (0.1)	522 (5.2)	3 (0.0)	521 (6.8)	10.8 (0.00)
Sharjah, UAE	72 (2.0)	518 (4.9)	23 (2.3)	468 (8.6)	5 (0.8)	495 (6.9)	10.5 (0.09)

This TIMSS context questionnaire scale was established in 2011 based on the combined response distribution of countries that participated in TIMSS 2011. To provide a point of reference for country comparisons, the scale centerpoint of 10 was located at the mean of the combined distribution. The units of the scale were chosen so that 2 scale score points corresponded to the standard deviation of the distribution.

() Standard errors appear in parentheses. Because of rounding some results may appear inconsistent.

An "r" indicates data are available for at least 70% but less than 85% of the students.

An "s" indicates data are available for at least 50% but less than 70% of the students.

A tilde (~) indicates insufficient data to report result.

SOURCE: IEA's Trends in International Mathematics and Science Study - TIMSS 2023
Downloaded from <https://timss2023.org/results>

Exhibit 4.2.8: School Discipline – Principals' Reports

Country	Hardly Any Problems		Minor Problems		Moderate to Severe Problems		Average Scale Score
	Percent of Students	Average Achievement	Percent of Students	Average Achievement	Percent of Students	Average Achievement	
Albania	90 (3.1)	487 (4.8)	8 (2.8)	526 (12.3)	2 ~	~ ~	11.1 (0.14)
Armenia	74 (4.2)	458 (3.1)	15 (3.3)	451 (6.5)	11 (2.9)	463 (7.2)	10.2 (0.20)
Australia	51 (4.2)	564 (3.6)	43 (4.3)	542 (4.7)	6 (1.9)	509 (11.5)	9.8 (0.11)
Azerbaijan	66 (3.9)	424 (4.2)	19 (3.2)	415 (8.1)	15 (2.6)	417 (11.7)	9.9 (0.16)
Bahrain	84 (2.1)	474 (4.7)	10 (1.9)	490 (12.3)	6 (0.9)	461 (14.2)	11.1 (0.09)
Belgium (Flemish)	58 (4.4)	505 (3.2)	36 (4.4)	478 (5.2)	6 (2.1)	428 (16.6)	10.0 (0.14)
Belgium (French)	47 (3.6)	495 (4.1)	51 (3.6)	467 (4.3)	2 ~	~ ~	9.6 (0.10)
Bosnia & Herzegovina	56 (6.6)	450 (5.4)	24 (6.0)	451 (7.5)	20 (5.2)	455 (5.3)	9.4 (0.29)
Brazil	51 (3.8)	438 (4.7)	38 (3.5)	408 (6.6)	11 (1.7)	435 (17.0)	9.6 (0.15)
Bulgaria	73 (3.4)	550 (3.9)	19 (2.7)	486 (14.8)	8 (2.4)	442 (37.6)	10.4 (0.15)
Canada	48 (2.6)	529 (3.0)	47 (2.6)	519 (2.8)	5 (1.1)	495 (5.9)	9.6 (0.08)
Chile	43 (4.1)	493 (5.0)	47 (4.2)	477 (4.4)	11 (2.4)	460 (9.0)	9.3 (0.12)
Chinese Taipei	79 (3.1)	574 (1.9)	21 (3.1)	568 (4.2)	1 ~	~ ~	10.8 (0.10)
Cyprus	57 (3.5)	494 (4.3)	40 (3.5)	481 (4.8)	3 (0.7)	444 (28.0)	9.9 (0.10)
Czech Republic	68 (3.8)	528 (3.0)	29 (3.8)	521 (4.4)	3 (1.3)	505 (6.2)	10.1 (0.10)
Denmark	48 (4.5)	534 (3.7)	50 (4.5)	514 (3.7)	2 ~	~ ~	9.6 (0.09)
England	75 (3.5)	564 (3.3)	24 (3.6)	541 (6.7)	1 ~	~ ~	10.3 (0.11)
Finland	56 (3.9)	547 (3.6)	42 (3.8)	535 (5.2)	2 ~	~ ~	9.7 (0.10)
France	58 (4.2)	498 (3.5)	38 (4.2)	471 (5.8)	4 (1.6)	456 (12.5)	10.0 (0.13)
Georgia	74 (3.4)	469 (4.2)	22 (3.3)	446 (4.9)	5 (1.6)	483 (20.6)	10.3 (0.13)
Germany	25 (3.0)	534 (4.5)	63 (3.4)	515 (4.1)	11 (2.2)	495 (9.9)	8.8 (0.08)
Hong Kong SAR	90 (2.7)	549 (4.8)	9 (2.9)	529 (13.4)	1 ~	~ ~	11.1 (0.15)
Hungary	56 (3.9)	539 (4.3)	34 (3.9)	514 (6.7)	10 (2.4)	466 (17.9)	9.7 (0.11)
Iran, Islamic Rep. of	58 (3.5)	443 (5.7)	33 (3.3)	415 (9.6)	8 (1.9)	423 (15.3)	9.9 (0.12)
Ireland	85 (3.0)	537 (3.4)	14 (2.9)	509 (6.6)	1 ~	~ ~	10.7 (0.11)
Italy	62 (4.2)	515 (3.0)	26 (3.7)	508 (5.1)	12 (2.8)	501 (12.1)	9.7 (0.15)
Japan	67 (3.8)	556 (2.6)	29 (4.1)	552 (4.3)	4 (1.4)	568 (15.0)	10.0 (0.09)
Jordan	37 (4.3)	432 (9.3)	30 (3.9)	409 (9.7)	33 (3.7)	408 (8.4)	8.4 (0.20)
Kazakhstan	83 (3.0)	468 (4.2)	8 (2.1)	462 (9.7)	9 (2.3)	452 (15.0)	10.9 (0.15)
Korea, Rep. of	63 (4.6)	590 (2.8)	29 (4.3)	576 (3.8)	9 (2.3)	560 (19.5)	10.1 (0.15)
Kosovo	41 (4.5)	401 (5.9)	35 (4.4)	409 (4.6)	24 (3.8)	392 (10.8)	8.9 (0.19)
Kuwait	41 (3.7)	389 (9.4)	39 (4.0)	374 (10.1)	20 (3.0)	332 (12.0)	9.0 (0.14)
Latvia	51 (3.9)	523 (4.4)	45 (4.0)	527 (4.0)	4 (1.6)	523 (14.1)	9.8 (0.11)
Lithuania	58 (3.8)	539 (3.5)	41 (3.7)	535 (5.0)	1 ~	~ ~	10.0 (0.11)
Macao SAR	73 (0.1)	538 (1.4)	20 (0.1)	539 (2.9)	6 (0.0)	499 (3.5)	10.8 (0.00)
Montenegro	44 (0.6)	465 (3.2)	41 (0.6)	461 (2.5)	15 (0.5)	460 (3.8)	9.2 (0.03)
Morocco	25 (3.6)	422 (12.2)	26 (3.2)	398 (12.7)	50 (4.3)	373 (6.1)	7.7 (0.21)
Netherlands	69 (6.2)	521 (4.2)	26 (5.8)	507 (7.1)	4 (2.5)	473 (30.2)	10.7 (0.22)
New Zealand	65 (4.5)	527 (5.0)	31 (4.3)	507 (7.0)	4 (2.1)	471 (15.1)	10.0 (0.12)
North Macedonia	63 (3.2)	450 (4.7)	24 (3.0)	426 (10.3)	13 (2.5)	423 (9.7)	9.9 (0.16)
Norway (5)	34 (4.0)	545 (3.9)	56 (4.4)	528 (3.7)	10 (2.4)	511 (5.5)	9.2 (0.10)
Oman	39 (3.2)	438 (7.3)	35 (3.4)	430 (6.6)	27 (3.1)	424 (10.0)	8.8 (0.16)
Poland	44 (3.9)	553 (3.7)	48 (3.9)	546 (3.1)	8 (2.2)	554 (6.6)	9.4 (0.10)
Portugal	52 (4.0)	514 (3.3)	39 (3.8)	507 (4.5)	10 (2.4)	510 (7.5)	9.5 (0.15)
Qatar	69 (3.5)	472 (4.5)	23 (3.3)	471 (8.9)	8 (2.0)	465 (14.1)	10.3 (0.15)
Romania	74 (4.8)	532 (6.6)	22 (5.0)	511 (12.2)	4 (2.1)	551 (24.5)	10.5 (0.20)
Saudi Arabia	67 (3.4)	429 (4.8)	14 (2.5)	428 (15.1)	19 (2.5)	425 (10.2)	9.9 (0.16)
Serbia	64 (4.0)	506 (4.1)	34 (3.9)	517 (4.8)	2 ~	~ ~	10.3 (0.12)
Singapore	77 (0.0)	610 (3.0)	23 (0.0)	596 (6.2)	0 ~	~ ~	10.7 (0.00)
Slovak Republic	69 (3.6)	532 (3.3)	23 (3.5)	518 (8.2)	8 (2.0)	424 (25.8)	10.1 (0.13)
Slovenia	42 (4.0)	525 (3.0)	50 (4.2)	524 (3.0)	8 (2.4)	531 (7.3)	9.3 (0.10)
South Africa (5)	25 (3.2)	332 (16.7)	56 (3.5)	298 (9.9)	20 (2.6)	277 (13.2)	8.8 (0.09)
Spain	74 (2.7)	509 (2.4)	21 (2.4)	491 (4.6)	5 (1.4)	489 (9.5)	10.5 (0.10)
Sweden	35 (4.0)	545 (4.6)	60 (4.0)	525 (4.7)	5 (1.6)	521 (15.2)	9.3 (0.10)
Türkiye (5)	45 (4.4)	579 (4.9)	36 (4.3)	563 (6.7)	18 (3.6)	562 (11.9)	9.3 (0.18)
United Arab Emirates	71 (1.0)	511 (2.1)	22 (1.1)	448 (5.5)	7 (0.5)	456 (4.4)	10.3 (0.05)
United States	52 (3.8)	544 (4.4)	41 (3.7)	525 (5.1)	7 (1.8)	486 (12.6)	9.7 (0.10)
Uzbekistan	44 (4.2)	416 (5.1)	9 (2.6)	403 (11.0)	47 (4.3)	409 (4.5)	8.4 (0.27)
International Average	58 (0.5)	502 (0.7)	32 (0.5)	488 (1.0)	10 (0.3)	465 (2.1)	
Benchmarking Participants							
Ontario, Canada	50 (4.3)	528 (4.6)	48 (4.3)	528 (4.5)	2 ~	~ ~	9.7 (0.12)
Quebec, Canada	35 (4.3)	510 (4.9)	55 (4.8)	511 (3.6)	10 (3.1)	498 (6.8)	9.2 (0.14)
Abu Dhabi, UAE	67 (2.5)	458 (3.5)	26 (2.5)	404 (10.1)	7 (1.1)	409 (9.9)	10.0 (0.11)
Dubai, UAE	81 (0.1)	571 (2.1)	15 (0.1)	526 (5.1)	3 (0.0)	527 (5.8)	10.8 (0.00)
Sharjah, UAE	72 (2.0)	517 (5.5)	23 (2.3)	458 (8.6)	5 (0.8)	487 (8.5)	10.5 (0.09)

This TIMSS context questionnaire scale was established in 2011 based on the combined response distribution of countries that participated in TIMSS 2011. To provide a point of reference for country comparisons, the scale centerpoint of 10 was located at the mean of the combined distribution. The units of the scale were chosen so that 2 scale score points corresponded to the standard deviation of the distribution.

() Standard errors appear in parentheses. Because of rounding some results may appear inconsistent.

An "r" indicates data are available for at least 70% but less than 85% of the students.

An "s" indicates data are available for at least 50% but less than 70% of the students.

A tilde (~) indicates insufficient data to report result.

SOURCE: IEA's Trends in International Mathematics and Science Study - TIMSS 2023
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TIMSS & PIRLS
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Exhibit 4.2.9: School Discipline – Principals' Reports

Country	Hardly Any Problems		Minor Problems		Moderate to Severe Problems		Average Scale Score	
	Percent of Students	Average Achievement	Percent of Students	Average Achievement	Percent of Students	Average Achievement		
Australia	r	31 (2.6)	538 (6.8)	57 (3.5)	506 (5.5)	13 (2.6)	471 (11.4)	9.9 (0.10)
Austria		22 (3.5)	521 (6.2)	63 (4.1)	516 (4.3)	15 (2.9)	486 (13.5)	9.4 (0.12)
Azerbaijan		58 (4.0)	477 (5.0)	27 (3.3)	492 (7.8)	15 (3.0)	466 (14.5)	10.4 (0.20)
Bahrain		70 (0.6)	436 (3.1)	25 (0.6)	408 (4.4)	5 (0.1)	384 (14.7)	11.4 (0.03)
Brazil		26 (2.8)	386 (8.1)	56 (3.1)	371 (4.1)	18 (2.2)	378 (17.0)	9.4 (0.12)
Chile	r	25 (3.9)	442 (6.8)	59 (4.7)	413 (5.4)	16 (3.4)	394 (9.9)	9.7 (0.16)
Chinese Taipei		69 (3.6)	609 (4.4)	31 (3.5)	589 (4.8)	1 ~	~ ~	11.4 (0.11)
Cote d'Ivoire		8 (2.6)	258 (8.2)	45 (4.7)	269 (9.9)	46 (4.6)	258 (4.6)	8.1 (0.19)
Cyprus		36 (2.7)	508 (4.6)	48 (2.7)	495 (7.0)	16 (0.6)	461 (3.7)	10.0 (0.08)
Czech Republic		44 (3.5)	533 (3.8)	54 (3.6)	507 (3.9)	2 ~	~ ~	10.5 (0.08)
England	r	48 (5.2)	535 (8.8)	50 (5.3)	508 (8.1)	2 ~	~ ~	10.5 (0.14)
Finland		14 (2.6)	508 (6.8)	78 (3.1)	504 (3.1)	8 (2.0)	492 (11.4)	9.5 (0.08)
France		28 (4.0)	506 (5.6)	54 (4.7)	474 (4.7)	18 (3.3)	459 (7.5)	9.6 (0.13)
Georgia		53 (3.7)	464 (4.7)	42 (3.9)	471 (5.6)	5 (1.8)	454 (19.0)	10.7 (0.15)
Hong Kong SAR	s	75 (4.1)	596 (9.2)	24 (4.0)	563 (12.4)	1 ~	~ ~	11.5 (0.17)
Hungary		44 (4.2)	527 (5.5)	50 (4.2)	496 (6.3)	6 (2.1)	450 (15.6)	10.2 (0.10)
Iran, Islamic Rep. of		42 (3.1)	434 (6.4)	45 (3.3)	419 (4.8)	13 (2.3)	404 (6.9)	10.3 (0.12)
Ireland		57 (4.6)	531 (2.5)	41 (4.7)	513 (6.5)	2 ~	~ ~	10.7 (0.10)
Israel		26 (3.1)	512 (10.9)	61 (3.5)	485 (4.9)	13 (2.2)	456 (12.1)	9.7 (0.12)
Italy		24 (3.5)	505 (5.5)	64 (3.9)	502 (4.1)	12 (3.4)	491 (13.1)	9.6 (0.15)
Japan		66 (4.4)	596 (3.5)	30 (4.3)	594 (6.3)	4 (1.8)	573 (4.2)	10.9 (0.13)
Jordan		27 (3.5)	399 (6.4)	41 (3.8)	379 (4.7)	32 (3.5)	387 (7.1)	9.1 (0.18)
Kazakhstan		75 (3.6)	459 (4.9)	18 (3.2)	430 (8.9)	7 (2.0)	472 (9.9)	11.7 (0.17)
Korea, Rep. of		53 (4.2)	598 (4.7)	37 (3.9)	595 (4.5)	10 (2.6)	587 (9.2)	10.8 (0.17)
Kuwait		27 (3.6)	430 (14.1)	45 (4.5)	398 (9.6)	28 (3.8)	371 (5.7)	9.3 (0.19)
Lithuania		34 (4.1)	519 (6.4)	62 (4.1)	508 (3.8)	4 (1.7)	482 (33.0)	10.1 (0.11)
Malaysia		46 (4.0)	423 (5.1)	50 (3.9)	401 (4.9)	4 (1.6)	390 (19.1)	10.6 (0.14)
Malta		41 (0.1)	520 (1.9)	46 (0.1)	491 (1.7)	13 (0.1)	461 (2.5)	10.2 (0.00)
Morocco		8 (2.0)	395 (15.0)	36 (3.7)	368 (5.5)	55 (3.7)	380 (4.6)	7.8 (0.15)
Norway (9)	r	12 (2.6)	508 (6.1)	72 (4.0)	501 (2.9)	16 (3.4)	500 (7.2)	9.3 (0.11)
Oman		55 (3.1)	419 (4.2)	25 (2.8)	407 (6.3)	20 (2.8)	398 (5.6)	10.5 (0.19)
Palestinian Nat'l Auth.		38 (3.4)	403 (4.9)	43 (3.4)	374 (3.9)	19 (2.7)	357 (6.5)	9.9 (0.16)
Portugal		31 (3.7)	490 (5.4)	61 (3.8)	471 (3.6)	8 (2.5)	447 (11.8)	9.8 (0.12)
Qatar		62 (4.6)	446 (5.8)	30 (4.3)	458 (11.2)	8 (1.9)	468 (16.7)	11.1 (0.18)
Romania	s	64 (6.2)	503 (7.7)	31 (5.8)	484 (13.6)	5 (2.3)	525 (34.6)	11.0 (0.21)
Saudi Arabia		57 (3.6)	400 (5.5)	18 (2.9)	396 (8.2)	24 (2.9)	388 (6.4)	10.4 (0.19)
Singapore		70 (4.2)	621 (6.7)	30 (4.2)	567 (12.2)	0 ~	~ ~	11.4 (0.13)
South Africa (9)	r	13 (2.5)	434 (12.7)	58 (3.6)	395 (3.9)	29 (3.0)	379 (6.2)	8.9 (0.11)
Sweden		12 (2.7)	531 (7.6)	76 (3.3)	519 (3.0)	11 (2.6)	494 (10.0)	9.4 (0.10)
Türkiye		43 (3.9)	522 (7.4)	42 (4.0)	500 (7.3)	14 (3.2)	491 (17.2)	10.1 (0.21)
United Arab Emirates		69 (1.7)	498 (2.5)	26 (1.6)	460 (4.0)	5 (0.7)	495 (12.3)	11.4 (0.07)
United States		31 (3.8)	509 (7.4)	56 (4.3)	487 (5.5)	12 (2.5)	442 (11.0)	9.9 (0.14)
Uzbekistan		36 (4.0)	426 (9.0)	14 (3.2)	429 (10.0)	50 (4.2)	415 (4.8)	8.8 (0.27)
International Average		41 (0.5)	485 (1.1)	45 (0.6)	468 (1.0)	14 (0.4)	443 (2.2)	
Benchmarking Participants								
Abu Dhabi, UAE	r	67 (3.1)	460 (4.1)	29 (3.0)	429 (7.0)	4 (1.0)	474 (14.3)	11.3 (0.13)
Dubai, UAE		71 (3.0)	560 (4.3)	24 (2.8)	508 (9.4)	5 (1.5)	519 (21.7)	11.4 (0.15)
Sharjah, UAE		73 (3.7)	507 (7.3)	23 (3.5)	470 (8.3)	4 (1.0)	523 (24.4)	11.5 (0.14)

This TIMSS context questionnaire scale was established in 2011 based on the combined response distribution of countries that participated in TIMSS 2011. To provide a point of reference for country comparisons, the scale centerpoint of 10 was located at the mean of the combined distribution. The units of the scale were chosen so that 2 scale score points corresponded to the standard deviation of the distribution.

() Standard errors appear in parentheses. Because of rounding some results may appear inconsistent.

An "r" indicates data are available for at least 70% but less than 85% of the students.

An "s" indicates data are available for at least 50% but less than 70% of the students.

A tilde (~) indicates insufficient data to report result.

SOURCE: IEA's Trends in International Mathematics and Science Study - TIMSS 2023
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Exhibit 4.2.10: School Discipline – Principals' Reports

Country	Hardly Any Problems		Minor Problems		Moderate to Severe Problems		Average Scale Score	
	Percent of Students	Average Achievement	Percent of Students	Average Achievement	Percent of Students	Average Achievement		
Australia	r	31 (2.6)	545 (6.2)	57 (3.5)	517 (4.9)	13 (2.6)	489 (11.2)	9.9 (0.10)
Austria		22 (3.5)	521 (7.4)	63 (4.1)	516 (4.8)	15 (2.9)	481 (13.8)	9.4 (0.12)
Azerbaijan		58 (4.0)	411 (4.1)	27 (3.3)	425 (6.2)	15 (3.0)	396 (8.9)	10.4 (0.20)
Bahrain		70 (0.6)	463 (2.9)	25 (0.6)	430 (4.7)	5 (0.1)	403 (12.6)	11.4 (0.03)
Brazil		26 (2.8)	425 (6.9)	56 (3.1)	414 (3.8)	18 (2.2)	422 (15.0)	9.4 (0.12)
Chile	r	25 (3.9)	477 (6.1)	59 (4.7)	452 (4.9)	16 (3.4)	436 (9.4)	9.7 (0.16)
Chinese Taipei		69 (3.6)	577 (3.5)	31 (3.5)	560 (3.9)	1 ~	~ ~	11.4 (0.11)
Cote d'Ivoire		8 (2.6)	165 (16.1)	45 (4.7)	191 (16.7)	46 (4.6)	178 (7.4)	8.1 (0.19)
Cyprus		36 (2.7)	476 (4.9)	48 (2.7)	466 (6.8)	16 (0.6)	433 (4.3)	10.0 (0.08)
Czech Republic		44 (3.5)	540 (3.5)	54 (3.6)	518 (3.4)	2 ~	~ ~	10.5 (0.08)
England	r	48 (5.2)	541 (8.0)	50 (5.3)	514 (7.5)	2 ~	~ ~	10.5 (0.14)
Finland		14 (2.6)	537 (8.1)	78 (3.1)	531 (3.5)	8 (2.0)	513 (14.6)	9.5 (0.08)
France		28 (4.0)	512 (5.4)	54 (4.7)	482 (4.6)	18 (3.3)	467 (7.5)	9.6 (0.13)
Georgia		53 (3.7)	445 (4.1)	42 (3.9)	451 (4.5)	5 (1.8)	445 (14.4)	10.7 (0.15)
Hong Kong SAR	s	75 (4.1)	544 (8.5)	24 (4.0)	518 (11.0)	1 ~	~ ~	11.5 (0.17)
Hungary		44 (4.2)	540 (4.7)	50 (4.2)	513 (5.4)	6 (2.1)	471 (14.7)	10.2 (0.10)
Iran, Islamic Rep. of		42 (3.1)	427 (6.6)	45 (3.3)	416 (4.7)	13 (2.3)	400 (6.7)	10.3 (0.12)
Ireland		57 (4.6)	533 (3.2)	41 (4.7)	520 (6.6)	2 ~	~ ~	10.7 (0.10)
Israel		26 (3.1)	502 (9.9)	61 (3.5)	477 (4.6)	13 (2.2)	462 (10.8)	9.7 (0.12)
Italy		24 (3.5)	508 (6.3)	64 (3.9)	501 (3.9)	12 (3.4)	489 (15.8)	9.6 (0.15)
Japan		66 (4.4)	560 (3.3)	30 (4.3)	553 (7.9)	4 (1.8)	533 (5.1)	10.9 (0.13)
Jordan		27 (3.5)	424 (7.1)	41 (3.8)	401 (5.3)	32 (3.5)	413 (8.2)	9.1 (0.18)
Kazakhstan		75 (3.6)	447 (4.0)	18 (3.2)	427 (9.4)	7 (2.0)	448 (8.9)	11.7 (0.17)
Korea, Rep. of		53 (4.2)	549 (3.4)	37 (3.9)	543 (3.6)	10 (2.6)	535 (8.3)	10.8 (0.17)
Kuwait		27 (3.6)	454 (15.5)	45 (4.5)	418 (9.2)	28 (3.8)	390 (7.0)	9.3 (0.19)
Lithuania		34 (4.1)	523 (5.7)	62 (4.1)	516 (3.5)	4 (1.7)	491 (25.6)	10.1 (0.11)
Malaysia		46 (4.0)	439 (5.7)	50 (3.9)	417 (5.3)	4 (1.6)	397 (20.0)	10.6 (0.14)
Malta		41 (0.1)	525 (2.4)	46 (0.1)	491 (2.4)	13 (0.1)	460 (3.8)	10.2 (0.00)
Morocco		8 (2.0)	334 (18.8)	36 (3.7)	318 (5.9)	55 (3.7)	331 (5.3)	7.8 (0.15)
Norway (9)	r	12 (2.6)	495 (7.6)	72 (4.0)	489 (3.5)	16 (3.4)	487 (7.5)	9.3 (0.11)
Oman		55 (3.1)	464 (4.1)	25 (2.8)	451 (6.1)	20 (2.8)	444 (6.2)	10.5 (0.19)
Palestinian Nat'l Auth.		38 (3.4)	416 (4.7)	43 (3.4)	386 (4.3)	19 (2.7)	363 (6.7)	9.9 (0.16)
Portugal		31 (3.7)	519 (4.9)	61 (3.8)	501 (3.0)	8 (2.5)	480 (12.0)	9.8 (0.12)
Qatar		62 (4.6)	479 (5.6)	30 (4.3)	485 (10.3)	8 (1.9)	491 (15.6)	11.1 (0.18)
Romania	s	64 (6.2)	472 (6.2)	31 (5.8)	458 (10.4)	5 (2.3)	490 (25.9)	11.0 (0.21)
Saudi Arabia		57 (3.6)	422 (5.6)	18 (2.9)	421 (9.0)	24 (2.9)	410 (7.2)	10.4 (0.19)
Singapore		70 (4.2)	622 (6.3)	30 (4.2)	568 (12.0)	0 ~	~ ~	11.4 (0.13)
South Africa (9)	r	13 (2.5)	408 (16.4)	58 (3.6)	363 (5.8)	29 (3.0)	341 (9.1)	8.9 (0.11)
Sweden		12 (2.7)	537 (8.5)	76 (3.3)	524 (3.8)	11 (2.6)	490 (11.0)	9.4 (0.10)
Türkiye		43 (3.9)	542 (6.1)	42 (4.0)	522 (6.0)	14 (3.2)	512 (13.5)	10.1 (0.21)
United Arab Emirates		69 (1.7)	498 (3.0)	26 (1.6)	454 (4.7)	5 (0.7)	492 (12.9)	11.4 (0.07)
United States		31 (3.8)	534 (6.7)	56 (4.3)	513 (4.9)	12 (2.5)	470 (11.1)	9.9 (0.14)
Uzbekistan		36 (4.0)	400 (6.3)	14 (3.2)	404 (8.2)	50 (4.2)	390 (4.6)	8.8 (0.27)
International Average		41 (0.5)	483 (1.2)	45 (0.6)	466 (1.0)	14 (0.4)	442 (2.0)	
Benchmarking Participants								
Abu Dhabi, UAE	r	67 (3.1)	449 (5.6)	29 (3.0)	413 (9.1)	4 (1.0)	473 (16.6)	11.3 (0.13)
Dubai, UAE		71 (3.0)	563 (5.1)	24 (2.8)	511 (11.0)	5 (1.5)	512 (24.4)	11.4 (0.15)
Sharjah, UAE		73 (3.7)	514 (7.8)	23 (3.5)	468 (8.8)	4 (1.0)	521 (27.7)	11.5 (0.14)

This TIMSS context questionnaire scale was established in 2011 based on the combined response distribution of countries that participated in TIMSS 2011. To provide a point of reference for country comparisons, the scale centerpoint of 10 was located at the mean of the combined distribution. The units of the scale were chosen so that 2 scale score points corresponded to the standard deviation of the distribution.

() Standard errors appear in parentheses. Because of rounding some results may appear inconsistent.

An "r" indicates data are available for at least 70% but less than 85% of the students.

An "s" indicates data are available for at least 50% but less than 70% of the students.

A tilde (~) indicates insufficient data to report result.

SOURCE: IEA's Trends in International Mathematics and Science Study - TIMSS 2023
Downloaded from <https://timss2023.org/results>

Safe and Orderly School – Teachers’ Reports

Attending schools that teachers perceive as safe and orderly is associated with higher achievement in both grades and subjects. The TIMSS 2023 *Safe and Orderly School* scale (Exhibit 4.2.11) includes items that asked teachers of students in both the fourth and eighth grade about the degree to which they agreed with statements regarding safety and discipline within the school. Based on their teachers’ responses, students were categorized as being in “very safe and orderly” schools, “somewhat safe and orderly” schools, or “less than safe and orderly” schools.

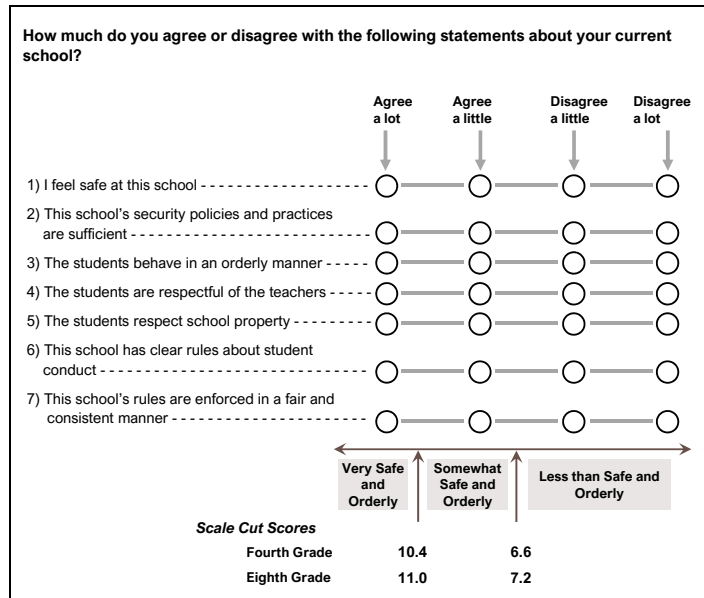
Across countries, on average, approximately half of fourth-grade students (52%) attended schools judged by their teachers to be “very safe and orderly,” with almost all of the remaining students (44%) in schools perceived by teachers to be “somewhat safe and orderly.” The small remainder of fourth-grade students (4%) attended schools perceived as “less than safe and orderly.” Fourth-grade students in schools that teachers perceived as “very safe and orderly” had modestly higher average achievement in mathematics and science compared to students in the other two classifications (Exhibit 4.2.12 and 4.2.13, respectively). Internationally, on average, fourth-grade students attending “very safe and orderly” schools as reported by their teachers had an average mathematics achievement of 509 and an average science achievement of 501. The small number of students in “less than safe and orderly” schools had the lowest average achievement (489 in mathematics and 488 in science). Average achievement for fourth-grade students in “somewhat safe and orderly” schools was in between (500 in mathematics and 489 in science).

Less than half of eighth-grade students internationally were in “very safe and orderly” schools– 43% on average across countries. Most remaining eighth-grade students were in schools that teachers reported to be “somewhat safe and orderly” (50% on average across countries) and only 7 percent were in “less than safe and orderly” schools. There was a positive relationship between teachers’ reports of school safety and average mathematics and science achievement in the eighth grade (Exhibits 4.2.14 and 4.2.15, respectively). Eighth-grade students in “very safe and orderly” schools had the highest average achievement in both subjects (484 in mathematics and 488 in science), followed by those in “somewhat safe and orderly” schools (468 in mathematics and 474 in science), and finally, the small percentage of students in “less than safe and orderly” schools (464 in mathematics and 467 in science).

Exhibit 4.2.11: Safe and Orderly School – Teachers' Reports

About the Scale

Students were scored according to their teachers' responses to seven statements on the *Safe and Orderly School* scale. Cut scores divide the scale into three categories. Students in **Very Safe and Orderly** schools had a score at or above the cut score corresponding to their teachers "agreeing a lot" with four of the seven statements and "agreeing a little" with the other three, on average. Students in **Less than Safe and Orderly** schools had a score at or below the cut score corresponding to their teachers "disagreeing a little" with four of the seven statements and "agreeing a little" with the other three, on average. All other students were in **Somewhat Safe and Orderly** schools.



SOURCE: IEA's Trends in International Mathematics and Science Study - TIMSS 2023
Downloaded from <https://timss2023.org/results>

Exhibit 4.2.12: Safe and Orderly School – Teachers' Reports

Country	Very Safe and Orderly		Somewhat Safe and Orderly		Less than Safe and Orderly		Average Scale Score
	Percent of Students	Average Achievement	Percent of Students	Average Achievement	Percent of Students	Average Achievement	
Albania	r 87 (3.5)	508 (5.7)	13 (3.5)	508 (14.8)	0 ~	~	12.2 (0.14)
Armenia	83 (2.9)	513 (3.2)	17 (2.8)	510 (7.3)	0 ~	~	11.5 (0.12)
Australia	r 52 (4.4)	537 (4.0)	42 (4.2)	525 (6.2)	6 (1.7)	476 (15.0)	10.2 (0.19)
Azerbaijan	r 74 (3.5)	494 (4.8)	25 (3.4)	495 (7.8)	0 ~	~	11.4 (0.14)
Bahrain	67 (3.3)	467 (5.3)	30 (3.3)	456 (8.8)	3 (1.3)	384 (21.1)	11.1 (0.15)
Belgium (Flemish)	r 20 (3.0)	534 (4.6)	74 (3.1)	521 (2.4)	5 (1.6)	518 (11.6)	8.9 (0.11)
Belgium (French)	22 (2.9)	509 (4.8)	67 (3.1)	488 (3.3)	11 (2.2)	479 (10.2)	9.0 (0.16)
Bosnia & Herzegovina	r 60 (5.0)	447 (3.9)	38 (4.8)	450 (5.7)	3 (1.1)	481 (14.2)	10.4 (0.16)
Brazil	52 (2.4)	413 (5.9)	41 (2.5)	389 (5.1)	7 (1.5)	376 (12.6)	10.2 (0.11)
Bulgaria	71 (3.8)	536 (4.7)	27 (3.5)	524 (7.8)	2 ~	~	10.8 (0.16)
Canada	33 (2.0)	512 (3.2)	54 (2.3)	504 (2.8)	13 (1.7)	487 (4.4)	9.3 (0.09)
Chile	28 (4.0)	454 (5.7)	67 (4.0)	439 (3.4)	6 (2.0)	436 (13.9)	9.1 (0.16)
Chinese Taipei	33 (3.2)	606 (2.6)	62 (3.4)	607 (2.4)	5 (1.7)	623 (5.6)	9.5 (0.13)
Cyprus	55 (3.3)	520 (3.5)	41 (3.3)	515 (3.4)	4 (1.4)	484 (14.6)	10.4 (0.14)
Czech Republic	42 (3.4)	530 (3.1)	56 (3.5)	531 (3.4)	2 ~	~	9.7 (0.09)
Denmark	r 33 (3.7)	529 (4.2)	62 (3.9)	524 (2.8)	5 (1.6)	511 (6.3)	9.5 (0.13)
England	r 71 (4.1)	558 (4.1)	25 (4.1)	544 (6.4)	3 (1.6)	531 (14.9)	11.1 (0.16)
Finland	23 (3.1)	537 (4.6)	68 (3.3)	529 (2.9)	8 (1.8)	515 (7.8)	9.1 (0.13)
France	r 28 (2.9)	498 (4.9)	65 (3.2)	481 (3.7)	6 (2.0)	468 (16.6)	9.3 (0.12)
Georgia	62 (3.4)	497 (3.9)	35 (3.5)	499 (5.3)	3 (1.4)	491 (9.8)	10.8 (0.14)
Germany	33 (3.2)	533 (4.0)	63 (3.2)	520 (3.2)	4 (1.4)	504 (7.7)	9.4 (0.11)
Hong Kong SAR	r 53 (4.1)	599 (5.9)	45 (4.2)	588 (7.1)	3 (1.5)	626 (30.5)	10.4 (0.16)
Hungary	r 41 (3.7)	529 (5.4)	54 (3.7)	515 (6.5)	5 (1.5)	483 (19.7)	9.8 (0.14)
Iran, Islamic Rep. of	71 (3.4)	421 (4.7)	28 (3.4)	419 (9.8)	2 ~	~	11.0 (0.14)
Ireland	76 (3.7)	549 (3.3)	23 (3.6)	540 (6.6)	2 ~	~	11.4 (0.16)
Italy	35 (3.3)	519 (5.6)	60 (3.1)	511 (3.4)	5 (1.4)	497 (13.4)	9.5 (0.12)
Japan	3 (1.5)	612 (10.8)	84 (3.3)	590 (2.2)	13 (2.9)	590 (8.8)	8.2 (0.11)
Jordan	54 (4.3)	439 (7.3)	40 (4.3)	415 (8.6)	6 (1.8)	397 (16.9)	10.5 (0.17)
Kazakhstan	63 (3.1)	488 (4.1)	36 (3.1)	487 (7.4)	1 ~	~	10.9 (0.14)
Korea, Rep. of	41 (3.9)	598 (4.1)	55 (3.9)	594 (4.2)	4 (1.4)	592 (7.2)	9.6 (0.15)
Kosovo	69 (3.5)	454 (4.2)	30 (3.4)	454 (4.9)	1 ~	~	11.2 (0.13)
Kuwait	76 (3.5)	384 (5.9)	23 (3.5)	369 (13.0)	2 ~	~	11.1 (0.14)
Latvia	39 (4.0)	539 (4.3)	58 (4.2)	531 (4.1)	4 (1.4)	540 (10.7)	9.6 (0.13)
Lithuania	46 (3.6)	564 (4.4)	51 (3.6)	559 (4.1)	3 (1.1)	531 (23.7)	10.1 (0.12)
Macao SAR	61 (0.1)	590 (1.2)	38 (0.1)	571 (1.8)	1 ~	~	10.7 (0.00)
Montenegro	74 (2.5)	480 (2.6)	24 (2.5)	466 (4.5)	2 ~	~	11.0 (0.09)
Morocco	55 (3.6)	413 (6.5)	39 (3.3)	379 (6.7)	6 (1.7)	325 (13.9)	10.4 (0.15)
Netherlands	s 43 (4.8)	541 (4.3)	56 (4.7)	533 (3.7)	1 ~	~	10.1 (0.19)
New Zealand	s 57 (4.5)	505 (5.4)	40 (4.5)	487 (5.0)	3 (1.2)	490 (8.4)	10.5 (0.18)
North Macedonia	r 71 (3.5)	475 (4.9)	25 (3.3)	481 (9.1)	4 (1.5)	415 (19.9)	11.0 (0.15)
Norway (5)	r 33 (3.7)	540 (4.2)	58 (3.8)	529 (2.7)	8 (1.7)	519 (5.9)	9.3 (0.16)
Oman	51 (3.1)	429 (6.6)	44 (3.0)	416 (5.4)	6 (1.5)	408 (12.3)	10.2 (0.13)
Poland	29 (3.4)	547 (4.1)	69 (3.5)	545 (2.7)	2 ~	~	9.4 (0.10)
Portugal	62 (3.4)	519 (3.7)	37 (3.4)	515 (4.4)	1 ~	~	10.8 (0.12)
Qatar	80 (2.8)	462 (4.1)	19 (2.8)	471 (8.5)	1 ~	~	11.7 (0.12)
Romania	r 72 (4.2)	542 (6.1)	28 (4.1)	546 (7.4)	1 ~	~	11.1 (0.16)
Saudi Arabia	74 (3.2)	421 (5.3)	23 (3.1)	425 (8.2)	3 (1.3)	387 (14.5)	11.4 (0.15)
Serbia	59 (3.3)	523 (4.7)	39 (3.4)	523 (4.8)	3 (1.2)	528 (14.7)	10.6 (0.13)
Singapore	53 (2.6)	613 (4.0)	44 (2.6)	616 (4.8)	3 (0.8)	628 (11.4)	10.3 (0.11)
Slovak Republic	42 (3.3)	524 (3.6)	54 (3.1)	511 (4.2)	4 (1.3)	470 (19.1)	9.7 (0.13)
Slovenia	16 (2.8)	511 (4.8)	75 (3.0)	514 (2.0)	9 (1.8)	513 (4.3)	8.7 (0.11)
South Africa (5)	r 41 (3.4)	383 (8.4)	50 (3.4)	351 (6.6)	9 (1.9)	354 (14.2)	9.5 (0.15)
Spain	69 (2.9)	504 (2.5)	27 (2.7)	487 (3.5)	3 (1.1)	490 (14.7)	11.0 (0.10)
Sweden	21 (3.8)	544 (5.1)	72 (4.2)	529 (3.1)	7 (2.0)	493 (18.4)	9.0 (0.17)
Türkiye (5)	45 (4.0)	564 (5.7)	47 (4.3)	546 (6.7)	8 (2.5)	537 (15.4)	9.9 (0.17)
United Arab Emirates	75 (1.1)	511 (2.0)	23 (1.1)	467 (4.1)	1 ~	~	11.5 (0.05)
United States	37 (2.6)	530 (5.6)	53 (2.5)	513 (3.8)	10 (1.6)	491 (9.8)	9.4 (0.13)
Uzbekistan	91 (2.3)	443 (3.3)	9 (2.3)	444 (12.9)	0 ~	~	12.2 (0.09)
International Average	52 (0.4)	509 (0.6)	44 (0.5)	500 (0.8)	4 (0.2)	489 (2.3)	
Benchmarking Participants							
Ontario, Canada	32 (3.4)	513 (5.9)	49 (3.8)	504 (5.1)	19 (3.1)	486 (6.4)	9.2 (0.17)
Quebec, Canada	16 (3.1)	531 (5.6)	73 (3.8)	513 (3.2)	10 (2.5)	499 (5.6)	8.6 (0.15)
Abu Dhabi, UAE	68 (2.0)	476 (3.4)	30 (2.1)	430 (5.7)	2 ~	~	11.1 (0.08)
Dubai, UAE	76 (1.7)	567 (2.2)	22 (1.8)	538 (5.2)	2 ~	~	11.6 (0.07)
Sharjah, UAE	84 (2.7)	513 (3.7)	16 (2.7)	453 (7.5)	0 ~	~	11.9 (0.14)

This TIMSS context questionnaire scale was established in 2011 based on the combined response distribution of countries that participated in TIMSS 2011. To provide a point of reference for country comparisons, the scale centerpoint of 10 was located at the mean of the combined distribution. The units of the scale were chosen so that 2 scale score points corresponded to the standard deviation of the distribution.

() Standard errors appear in parentheses. Because of rounding some results may appear inconsistent.

An "r" indicates data are available for at least 70% but less than 85% of the students.

An "s" indicates data are available for at least 50% but less than 70% of the students.

A tilde (~) indicates insufficient data to report result.

SOURCE: IEA's Trends in International Mathematics and Science Study - TIMSS 2023
Downloaded from <https://timss2023.org/results>



TIMSS & PIRLS
BOSTON COLLEGE

Exhibit 4.2.13: Safe and Orderly School – Teachers' Reports

Country		Very Safe and Orderly		Somewhat Safe and Orderly		Less than Safe and Orderly		Average Scale Score
		Percent of Students	Average Achievement	Percent of Students	Average Achievement	Percent of Students	Average Achievement	
Albania	r	87 (3.5)	487 (5.2)	13 (3.5)	490 (13.6)	0 ~	~ ~	12.2 (0.14)
Armenia		82 (3.4)	458 (2.9)	18 (3.4)	453 (7.3)	0 ~	~ ~	11.4 (0.13)
Australia	r	49 (4.3)	560 (3.4)	44 (4.1)	548 (4.8)	7 (1.7)	514 (11.3)	10.1 (0.19)
Azerbaijan	r	72 (3.2)	422 (4.4)	27 (3.2)	423 (6.5)	1 ~	~ ~	11.2 (0.14)
Bahrain		69 (3.2)	487 (5.3)	27 (3.1)	446 (8.8)	4 (1.4)	463 (17.0)	11.2 (0.15)
Belgium (Flemish)	r	21 (3.1)	506 (5.0)	74 (3.2)	488 (2.8)	5 (1.6)	481 (15.3)	9.0 (0.11)
Belgium (French)		24 (3.1)	501 (4.7)	65 (3.3)	479 (3.6)	11 (2.2)	472 (9.7)	9.0 (0.15)
Bosnia & Herzegovina	r	60 (5.0)	448 (4.6)	38 (4.8)	452 (5.6)	3 (1.1)	477 (10.8)	10.4 (0.16)
Brazil		52 (2.5)	438 (5.7)	41 (2.6)	414 (5.5)	7 (1.5)	395 (13.0)	10.2 (0.11)
Bulgaria		71 (3.8)	536 (6.6)	28 (3.7)	520 (10.0)	1 ~	~ ~	10.8 (0.15)
Canada		34 (2.2)	534 (3.0)	52 (2.3)	517 (2.9)	14 (1.8)	506 (4.8)	9.3 (0.10)
Chile		31 (4.2)	486 (5.1)	65 (4.4)	478 (4.1)	4 (1.9)	462 (15.6)	9.3 (0.18)
Chinese Taipei		37 (3.3)	570 (2.8)	59 (3.5)	573 (2.3)	4 (1.5)	588 (12.1)	9.5 (0.12)
Cyprus		48 (3.9)	496 (4.3)	46 (3.9)	483 (4.4)	6 (1.7)	453 (17.1)	10.2 (0.17)
Czech Republic		42 (3.4)	525 (2.9)	56 (3.4)	526 (3.2)	2 ~	~ ~	9.7 (0.10)
Denmark	r	35 (3.2)	530 (4.0)	57 (3.5)	520 (3.5)	9 (2.0)	504 (8.2)	9.4 (0.15)
England	r	70 (4.3)	561 (3.9)	26 (4.4)	553 (6.0)	3 (1.6)	534 (14.8)	11.0 (0.17)
Finland		22 (3.0)	556 (4.3)	70 (3.2)	541 (3.4)	8 (1.8)	525 (9.4)	9.1 (0.12)
France	r	28 (3.0)	503 (4.3)	65 (3.5)	486 (3.9)	7 (2.3)	469 (15.9)	9.2 (0.12)
Georgia		60 (3.4)	467 (4.0)	38 (3.5)	463 (6.3)	2 ~	~ ~	10.7 (0.13)
Germany		32 (3.2)	524 (4.9)	63 (3.3)	513 (3.9)	5 (1.4)	486 (10.3)	9.3 (0.10)
Hong Kong SAR	s	59 (5.2)	545 (6.2)	39 (5.2)	538 (9.4)	2 ~	~ ~	10.8 (0.23)
Hungary	r	40 (3.9)	533 (5.4)	56 (3.9)	517 (5.5)	4 (1.2)	517 (23.5)	9.8 (0.15)
Iran, Islamic Rep. of		71 (3.4)	434 (5.3)	28 (3.4)	428 (10.6)	2 ~	~ ~	11.0 (0.14)
Ireland		76 (3.7)	537 (3.5)	23 (3.6)	520 (7.7)	2 ~	~ ~	11.4 (0.16)
Italy		35 (3.3)	515 (5.1)	60 (3.1)	509 (2.8)	5 (1.4)	501 (12.3)	9.5 (0.12)
Japan		3 (1.1)	556 (6.9)	88 (2.8)	555 (2.7)	9 (2.5)	547 (6.6)	8.2 (0.09)
Jordan		50 (4.2)	422 (7.8)	41 (4.3)	412 (6.7)	8 (2.9)	425 (25.1)	10.2 (0.19)
Kazakhstan		65 (3.1)	471 (5.0)	34 (3.0)	459 (6.3)	1 ~	~ ~	11.0 (0.13)
Korea, Rep. of		43 (4.1)	588 (3.5)	54 (4.1)	581 (4.2)	3 (1.2)	581 (7.7)	9.8 (0.16)
Kosovo		69 (3.5)	406 (4.2)	30 (3.4)	406 (5.3)	1 ~	~ ~	11.2 (0.13)
Kuwait		73 (3.6)	385 (6.8)	25 (3.6)	340 (13.7)	2 ~	~ ~	11.1 (0.14)
Latvia		35 (4.2)	534 (4.3)	60 (4.4)	524 (3.4)	5 (1.9)	495 (20.4)	9.4 (0.13)
Lithuania		46 (3.6)	539 (4.4)	51 (3.6)	535 (3.9)	3 (1.1)	512 (21.0)	10.1 (0.12)
Macao SAR		51 (0.2)	536 (1.5)	44 (0.2)	537 (2.1)	6 (0.0)	518 (2.8)	10.2 (0.01)
Montenegro		74 (2.5)	464 (2.8)	24 (2.5)	449 (4.6)	2 ~	~ ~	11.0 (0.09)
Morocco		55 (3.6)	411 (7.6)	39 (3.3)	376 (7.4)	6 (1.7)	312 (14.9)	10.4 (0.15)
Netherlands	s	43 (4.8)	522 (4.9)	56 (4.7)	513 (4.7)	1 ~	~ ~	10.1 (0.19)
New Zealand	s	57 (4.5)	531 (5.2)	40 (4.4)	517 (5.3)	3 (1.2)	523 (14.7)	10.6 (0.19)
North Macedonia	r	72 (3.5)	441 (5.5)	25 (3.3)	444 (10.2)	4 (1.5)	392 (23.9)	11.1 (0.15)
Norway (5)	r	31 (3.8)	545 (3.8)	56 (3.6)	529 (3.5)	13 (2.3)	518 (5.3)	9.1 (0.15)
Oman		50 (3.0)	437 (6.9)	44 (3.1)	430 (5.7)	6 (1.5)	416 (14.6)	10.2 (0.13)
Poland		36 (3.8)	550 (4.0)	61 (3.6)	550 (2.7)	3 (1.1)	553 (12.0)	9.6 (0.13)
Portugal		64 (3.2)	512 (3.0)	35 (3.2)	508 (4.0)	1 ~	~ ~	10.9 (0.11)
Qatar		82 (2.5)	473 (4.1)	16 (2.4)	462 (8.1)	2 ~	~ ~	11.8 (0.12)
Romania	r	77 (3.0)	530 (5.7)	22 (3.0)	523 (7.4)	1 ~	~ ~	11.3 (0.16)
Saudi Arabia		76 (3.4)	431 (4.8)	21 (3.2)	410 (8.8)	3 (1.2)	425 (18.4)	11.4 (0.16)
Serbia		59 (3.3)	510 (4.3)	39 (3.4)	509 (4.7)	3 (1.2)	512 (11.9)	10.6 (0.13)
Singapore		60 (2.6)	609 (3.2)	37 (2.7)	604 (4.5)	3 (1.0)	613 (20.7)	10.6 (0.10)
Slovak Republic		39 (3.3)	533 (4.0)	57 (3.2)	516 (4.5)	4 (1.2)	464 (24.8)	9.7 (0.11)
Slovenia		16 (2.8)	522 (4.9)	75 (3.0)	526 (2.6)	9 (1.8)	521 (4.4)	8.7 (0.11)
South Africa (5)	r	39 (3.7)	338 (15.0)	53 (3.8)	294 (10.0)	9 (1.7)	259 (13.3)	9.5 (0.17)
Spain		65 (2.9)	509 (2.4)	32 (2.7)	493 (3.3)	4 (1.0)	506 (11.7)	10.8 (0.11)
Sweden		21 (3.9)	539 (7.7)	71 (4.1)	535 (3.0)	8 (2.6)	509 (25.4)	8.9 (0.17)
Türkiye (5)		48 (4.0)	576 (5.5)	46 (3.9)	564 (5.1)	6 (1.9)	575 (12.1)	10.0 (0.18)
United Arab Emirates		73 (1.1)	512 (2.5)	25 (1.1)	449 (5.6)	2 ~	~ ~	11.4 (0.05)
United States		36 (2.7)	544 (5.2)	53 (2.5)	529 (3.4)	10 (1.6)	508 (9.2)	9.4 (0.13)
Uzbekistan		93 (2.4)	411 (3.7)	7 (2.4)	417 (15.3)	0 ~	~ ~	12.2 (0.09)
International Average		52 (0.5)	501 (0.7)	44 (0.5)	489 (0.8)	4 (0.2)	488 (2.4)	
Benchmarking Participants								
Ontario, Canada		32 (3.5)	530 (5.6)	49 (3.8)	526 (4.5)	19 (3.1)	515 (6.0)	9.2 (0.17)
Quebec, Canada		21 (3.7)	520 (4.0)	67 (4.0)	507 (3.1)	12 (2.9)	487 (7.6)	8.8 (0.17)
Abu Dhabi, UAE		61 (2.1)	471 (4.5)	38 (2.2)	408 (6.4)	1 ~	~ ~	10.8 (0.09)
Dubai, UAE		74 (2.3)	578 (2.3)	23 (2.3)	530 (8.0)	3 (0.7)	483 (19.5)	11.4 (0.10)
Sharjah, UAE		85 (1.9)	511 (4.8)	14 (2.0)	457 (12.0)	1 ~	~ ~	12.0 (0.11)

This TIMSS context questionnaire scale was established in 2011 based on the combined response distribution of countries that participated in TIMSS 2011. To provide a point of reference for country comparisons, the scale centerpoint of 10 was located at the mean of the combined distribution. The units of the scale were chosen so that 2 scale score points corresponded to the standard deviation of the distribution.

() Standard errors appear in parentheses. Because of rounding some results may appear inconsistent.

An "r" indicates data are available for at least 70% but less than 85% of the students.

An "s" indicates data are available for at least 50% but less than 70% of the students.

A tilde (~) indicates insufficient data to report result.

SOURCE: IEA's Trends in International Mathematics and Science Study - TIMSS 2023
Downloaded from <https://timss2023.org/results>

Exhibit 4.2.14: Safe and Orderly School – Teachers' Reports

Country		Very Safe and Orderly		Somewhat Safe and Orderly		Less than Safe and Orderly		Average Scale Score
		Percent of Students	Average Achievement	Percent of Students	Average Achievement	Percent of Students	Average Achievement	
Australia	r	37 (3.3)	536 (6.7)	54 (3.5)	506 (5.8)	10 (2.2)	491 (13.1)	10.1 (0.15)
Austria		30 (3.3)	524 (5.1)	65 (3.3)	517 (3.5)	5 (1.7)	473 (12.3)	10.0 (0.13)
Azerbaijan		59 (3.5)	479 (6.0)	41 (3.6)	480 (5.3)	0 ~	~ ~	11.2 (0.13)
Bahrain		51 (3.3)	437 (5.7)	47 (3.4)	418 (6.4)	2 ~	~ ~	10.9 (0.11)
Brazil		37 (2.6)	396 (5.7)	52 (3.0)	373 (6.8)	11 (1.8)	357 (6.3)	9.9 (0.11)
Chile		22 (3.9)	426 (8.1)	63 (4.2)	416 (4.5)	15 (3.0)	407 (7.9)	9.3 (0.17)
Chinese Taipei		27 (3.2)	610 (7.4)	65 (3.2)	601 (4.3)	7 (2.1)	594 (13.0)	9.9 (0.16)
Cote d'Ivoire		37 (4.4)	273 (11.8)	56 (4.1)	257 (3.9)	7 (2.3)	263 (10.3)	10.1 (0.17)
Cyprus		39 (3.1)	507 (5.8)	52 (3.4)	485 (4.1)	9 (2.0)	488 (13.7)	10.1 (0.14)
Czech Republic		43 (3.2)	522 (4.2)	55 (3.2)	515 (3.5)	2 ~	~ ~	10.5 (0.12)
England	s	45 (5.0)	540 (8.9)	50 (5.2)	505 (9.2)	5 (2.0)	473 (10.5)	10.7 (0.22)
Finland		15 (2.3)	517 (7.1)	73 (2.9)	502 (2.9)	12 (2.1)	501 (7.6)	9.1 (0.10)
France		21 (3.3)	508 (7.2)	66 (4.1)	478 (4.2)	14 (2.8)	451 (11.0)	9.4 (0.14)
Georgia		55 (3.8)	466 (4.8)	42 (3.8)	470 (4.6)	3 (0.9)	438 (20.2)	11.0 (0.12)
Hong Kong SAR	r	48 (4.1)	605 (8.9)	48 (4.1)	550 (9.4)	4 (1.5)	535 (25.8)	10.7 (0.19)
Hungary		44 (4.0)	524 (5.8)	52 (3.9)	496 (5.9)	4 (1.4)	475 (16.2)	10.5 (0.16)
Iran, Islamic Rep. of		60 (2.9)	432 (4.9)	35 (2.8)	409 (5.8)	5 (1.5)	419 (9.5)	11.0 (0.13)
Ireland		55 (3.2)	531 (4.0)	40 (2.8)	518 (4.5)	5 (1.6)	487 (7.7)	10.9 (0.14)
Israel		38 (2.9)	489 (8.0)	57 (3.0)	487 (6.2)	5 (1.3)	499 (24.2)	10.3 (0.12)
Italy		30 (3.5)	512 (5.0)	65 (3.5)	497 (4.0)	5 (1.4)	482 (11.4)	9.8 (0.12)
Japan		6 (1.9)	614 (10.0)	83 (3.1)	593 (3.4)	11 (2.6)	598 (5.7)	8.8 (0.12)
Jordan		46 (3.8)	393 (5.6)	45 (3.5)	388 (5.8)	9 (2.1)	364 (10.8)	10.5 (0.17)
Kazakhstan		61 (3.5)	454 (4.9)	39 (3.5)	455 (5.5)	0 ~	~ ~	11.5 (0.14)
Korea, Rep. of		38 (4.0)	598 (6.0)	57 (4.2)	595 (4.1)	6 (1.8)	597 (4.7)	10.3 (0.18)
Kuwait		70 (4.0)	407 (7.3)	28 (3.8)	380 (7.2)	2 ~	~ ~	11.5 (0.15)
Lithuania		40 (3.5)	521 (6.5)	55 (3.6)	509 (4.2)	6 (1.7)	508 (10.4)	10.2 (0.13)
Malaysia		43 (2.6)	426 (6.2)	56 (2.6)	398 (4.5)	1 ~	~ ~	10.6 (0.11)
Malta		34 (0.1)	507 (1.8)	46 (0.1)	503 (1.9)	20 (0.1)	491 (2.9)	9.7 (0.01)
Morocco		36 (3.5)	387 (6.7)	49 (3.4)	374 (4.1)	15 (2.5)	372 (7.1)	9.8 (0.16)
Norway (9)	r	23 (3.1)	518 (4.0)	65 (3.1)	498 (2.5)	12 (2.2)	498 (10.3)	9.5 (0.13)
Oman		57 (3.5)	413 (3.3)	41 (3.4)	410 (5.2)	2 ~	~ ~	11.1 (0.13)
Palestinian Nat'l Auth.		39 (4.0)	390 (4.5)	53 (3.9)	382 (4.6)	8 (1.9)	354 (11.0)	10.3 (0.16)
Portugal		32 (3.2)	487 (5.5)	56 (3.6)	477 (3.8)	13 (1.9)	445 (8.5)	9.8 (0.13)
Qatar		73 (4.0)	453 (5.1)	23 (3.9)	442 (12.1)	3 (1.2)	438 (22.7)	11.8 (0.18)
Romania	r	63 (4.4)	508 (6.9)	33 (4.5)	486 (9.4)	4 (0.9)	515 (13.5)	11.4 (0.18)
Saudi Arabia		75 (3.2)	401 (4.3)	22 (3.0)	384 (6.6)	3 (1.2)	374 (22.4)	11.9 (0.14)
Singapore		57 (3.8)	608 (8.6)	37 (3.8)	601 (9.6)	6 (1.8)	607 (15.1)	11.0 (0.17)
South Africa (9)	r	26 (3.7)	411 (8.4)	61 (4.1)	396 (4.4)	14 (2.7)	370 (5.2)	9.3 (0.15)
Sweden		23 (3.2)	522 (7.3)	70 (3.3)	515 (3.1)	6 (1.4)	502 (8.6)	9.5 (0.12)
Türkiye		44 (4.1)	521 (7.3)	49 (3.8)	501 (7.2)	7 (2.0)	484 (20.3)	10.5 (0.19)
United Arab Emirates		73 (1.5)	494 (2.5)	23 (1.3)	468 (3.9)	3 (0.7)	417 (13.2)	11.9 (0.07)
United States		30 (3.3)	512 (8.6)	51 (3.1)	482 (6.0)	19 (2.5)	472 (8.2)	9.6 (0.17)
Uzbekistan		74 (3.3)	421 (5.7)	25 (3.3)	425 (6.2)	1 ~	~ ~	11.9 (0.14)
International Average		43 (0.5)	484 (1.0)	50 (0.5)	468 (0.9)	7 (0.3)	464 (2.2)	
Benchmarking Participants								
Abu Dhabi, UAE		66 (3.7)	461 (4.8)	29 (3.1)	436 (5.2)	5 (1.6)	386 (15.5)	11.5 (0.16)
Dubai, UAE		78 (1.9)	556 (4.4)	21 (1.8)	520 (8.0)	2 ~	~ ~	12.2 (0.08)
Sharjah, UAE		74 (3.4)	499 (5.1)	21 (3.0)	486 (8.4)	5 (1.9)	423 (20.3)	12.0 (0.18)

This TIMSS context questionnaire scale was established in 2011 based on the combined response distribution of countries that participated in TIMSS 2011. To provide a point of reference for country comparisons, the scale centerpoint of 10 was located at the mean of the combined distribution. The units of the scale were chosen so that 2 scale score points corresponded to the standard deviation of the distribution.

() Standard errors appear in parentheses. Because of rounding some results may appear inconsistent.

An "r" indicates data are available for at least 70% but less than 85% of the students.

An "s" indicates data are available for at least 50% but less than 70% of the students.

A tilde (~) indicates insufficient data to report result.

SOURCE: IEA's Trends in International Mathematics and Science Study - TIMSS 2023
Downloaded from <https://timss2023.org/results>

Exhibit 4.2.15: Safe and Orderly School – Teachers' Reports

Country		Very Safe and Orderly		Somewhat Safe and Orderly		Less than Safe and Orderly		Average Scale Score
		Percent of Students	Average Achievement	Percent of Students	Average Achievement	Percent of Students	Average Achievement	
Australia	s	35 (3.4)	545 (4.4)	49 (3.9)	519 (5.7)	16 (2.6)	501 (9.7)	9.7 (0.17)
Austria		29 (2.2)	526 (4.6)	67 (2.4)	509 (3.2)	4 (0.8)	479 (15.1)	10.0 (0.08)
Azerbaijan	r	64 (2.3)	410 (3.7)	33 (2.2)	414 (4.6)	3 (0.8)	400 (5.2)	11.3 (0.09)
Bahrain		56 (2.9)	467 (3.9)	38 (3.1)	437 (4.8)	6 (1.6)	417 (18.6)	11.2 (0.16)
Brazil		38 (2.9)	438 (5.6)	48 (2.6)	410 (5.3)	15 (2.3)	402 (6.1)	9.8 (0.15)
Chile		26 (3.7)	464 (8.0)	63 (4.3)	457 (3.9)	11 (2.6)	427 (9.8)	9.5 (0.17)
Chinese Taipei		35 (3.8)	579 (5.0)	57 (3.7)	568 (4.0)	8 (2.1)	568 (9.9)	9.9 (0.16)
Cyprus		38 (2.1)	475 (6.0)	52 (2.0)	457 (3.0)	10 (1.0)	457 (7.8)	9.9 (0.09)
Czech Republic		41 (2.3)	534 (2.4)	57 (2.2)	521 (2.6)	2 ~	~ ~	10.3 (0.07)
England	s	41 (4.8)	533 (8.0)	45 (5.0)	533 (9.2)	13 (3.5)	513 (12.5)	10.1 (0.22)
Finland		10 (1.5)	534 (5.5)	75 (1.9)	532 (3.4)	15 (1.6)	520 (5.9)	8.9 (0.08)
France		21 (2.6)	504 (5.4)	64 (2.9)	487 (3.5)	15 (2.4)	472 (6.7)	9.3 (0.13)
Georgia		49 (2.0)	449 (3.7)	48 (1.9)	447 (2.9)	3 (0.6)	438 (6.3)	10.8 (0.08)
Hong Kong SAR	s	47 (5.1)	553 (10.3)	50 (5.0)	515 (10.0)	3 (1.4)	498 (38.4)	10.8 (0.19)
Hungary		41 (2.8)	526 (4.0)	54 (2.8)	520 (4.4)	5 (1.1)	520 (9.7)	10.3 (0.11)
Iran, Islamic Rep. of		57 (3.3)	426 (5.1)	35 (3.1)	411 (6.4)	9 (1.8)	411 (12.3)	10.9 (0.16)
Ireland		55 (3.1)	531 (6.1)	41 (3.1)	527 (5.2)	4 (1.1)	508 (13.6)	11.0 (0.13)
Israel		35 (3.2)	474 (7.7)	52 (3.4)	489 (6.5)	12 (2.6)	470 (11.6)	10.1 (0.16)
Italy		31 (3.5)	513 (4.7)	64 (3.5)	493 (4.4)	4 (1.5)	497 (16.9)	9.8 (0.14)
Japan		7 (2.2)	564 (6.6)	82 (3.4)	558 (3.5)	11 (2.6)	544 (5.2)	8.8 (0.13)
Jordan		41 (4.0)	418 (6.0)	53 (4.2)	407 (6.1)	6 (1.8)	432 (17.1)	10.4 (0.17)
Kazakhstan		60 (2.1)	451 (3.5)	39 (2.1)	430 (4.1)	0 ~	~ ~	11.5 (0.09)
Korea, Rep. of		33 (3.7)	545 (4.2)	58 (3.9)	547 (2.6)	9 (2.2)	540 (10.3)	10.0 (0.17)
Kuwait		67 (3.9)	430 (7.4)	31 (3.9)	403 (8.1)	2 ~	~ ~	11.5 (0.15)
Lithuania		41 (2.3)	521 (4.7)	54 (2.2)	518 (3.0)	5 (1.1)	517 (10.5)	10.3 (0.09)
Malaysia		42 (3.1)	435 (5.8)	57 (3.1)	422 (5.3)	1 ~	~ ~	10.6 (0.11)
Malta		31 (0.5)	518 (2.4)	54 (0.5)	503 (2.3)	15 (0.4)	466 (4.7)	9.7 (0.02)
Morocco		29 (2.7)	335 (7.7)	57 (2.7)	324 (4.4)	14 (2.0)	319 (8.7)	9.6 (0.14)
Norway (9)	r	26 (3.4)	506 (5.2)	63 (3.4)	488 (3.0)	11 (2.0)	469 (5.5)	9.6 (0.15)
Oman		61 (3.0)	463 (3.5)	37 (3.0)	444 (3.9)	1 ~	~ ~	11.3 (0.11)
Palestinian Nat'l Auth.		47 (3.4)	406 (4.0)	46 (3.7)	383 (4.4)	8 (1.9)	366 (10.5)	10.6 (0.15)
Portugal		36 (2.6)	514 (3.5)	57 (2.6)	505 (2.9)	7 (1.4)	475 (10.3)	10.1 (0.11)
Qatar		73 (3.8)	482 (5.5)	23 (3.4)	480 (10.1)	4 (1.6)	466 (33.5)	11.9 (0.18)
Romania	r	71 (3.7)	473 (4.0)	28 (3.7)	466 (7.6)	1 ~	~ ~	11.8 (0.15)
Saudi Arabia		73 (3.4)	429 (4.2)	25 (3.3)	397 (7.3)	2 ~	~ ~	11.8 (0.15)
Singapore		52 (3.7)	625 (6.4)	44 (3.7)	590 (9.5)	4 (1.3)	541 (16.0)	11.0 (0.16)
South Africa (9)	s	26 (3.3)	400 (12.7)	58 (3.9)	356 (7.3)	16 (2.6)	344 (7.8)	9.3 (0.16)
Sweden	r	14 (3.0)	540 (8.6)	79 (3.3)	522 (3.8)	7 (1.9)	497 (8.7)	9.3 (0.11)
Türkiye		44 (4.0)	541 (4.7)	46 (3.6)	529 (6.3)	10 (2.6)	481 (9.6)	10.5 (0.19)
United Arab Emirates		69 (1.6)	497 (2.8)	28 (1.5)	460 (5.4)	3 (0.6)	430 (14.3)	11.8 (0.07)
United States		24 (3.3)	521 (9.1)	51 (3.3)	518 (5.5)	25 (2.7)	503 (7.2)	9.1 (0.18)
Uzbekistan		78 (2.2)	396 (4.3)	21 (2.2)	396 (4.0)	1 ~	~ ~	12.2 (0.10)
International Average		43 (0.5)	488 (0.9)	50 (0.5)	474 (0.8)	8 (0.3)	467 (2.3)	
Cote d'Ivoire	x	33 (4.1)	206 (22.6)	54 (4.4)	174 (7.9)	14 (3.2)	155 (10.9)	9.6 (0.16)
Benchmarking Participants								
Abu Dhabi, UAE		57 (3.0)	467 (5.6)	39 (3.0)	414 (7.9)	4 (1.4)	382 (15.2)	11.3 (0.14)
Dubai, UAE		70 (2.9)	556 (5.3)	27 (2.7)	534 (6.6)	3 (1.2)	495 (21.1)	11.8 (0.13)
Sharjah, UAE	r	80 (3.3)	494 (4.8)	19 (3.2)	492 (9.5)	2 ~	~ ~	12.2 (0.17)

This TIMSS context questionnaire scale was established in 2011 based on the combined response distribution of countries that participated in TIMSS 2011. To provide a point of reference for country comparisons, the scale centerpoint of 10 was located at the mean of the combined distribution. The units of the scale were chosen so that 2 scale score points corresponded to the standard deviation of the distribution.

() Standard errors appear in parentheses. Because of rounding some results may appear inconsistent.

An "r" indicates data are available for at least 70% but less than 85% of the students.

An "s" indicates data are available for at least 50% but less than 70% of the students.

An "x" indicates data are available for at least 40% but less than 50% of the students—interpret with caution.

A tilde (~) indicates insufficient data to report result.

SOURCE: IEA's Trends in International Mathematics and Science Study - TIMSS 2023
Downloaded from <https://timss2023.org/results>



TIMSS & PIRLS
BOSTON COLLEGE

Classroom Teaching Limited by Students Not Ready for Instruction – Teachers’ Reports

Students whose teachers reported that their instruction is limited by students’ readiness to learn have lower average achievement in both subjects in both grades. The TIMSS 2023 *Classroom Teaching Limited by Students Not Ready for Instruction* scale (Exhibit 4.2.16) includes items that asked teachers to report how much different indicators of students’ readiness to learn limited their instruction. Based on these responses, students were classified as having teachers who reported their instruction was limited “very little,” “some,” or “a lot.”

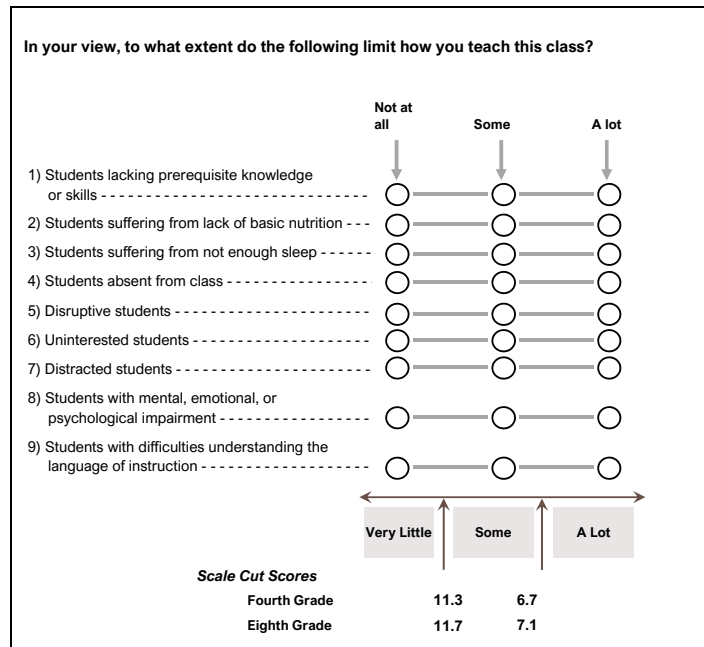
In the fourth grade, about a quarter of students internationally had teachers reporting that their instruction was limited “very little” by students’ readiness to learn (25% in mathematics and 26% in science). Most of the remaining students (68% in mathematics and 67% in science) had teachers reporting their instruction was limited “some,” while a small percentage of students (7% in mathematics and 6% in science) had teachers reporting their instruction was limited “a lot.” In both mathematics and science, fourth-grade students whose teachers reported their instruction being limited “very little” by students’ readiness to learn had the highest average achievement (520 in mathematics and 509 in science), as shown in Exhibits 4.2.17 and 4.2.18, respectively. These students had an advantage in average achievement over students’ whose teachers reported their instruction being limited “some” (20 points in mathematics and 18 points in science) and an even larger advantage over students’ whose teachers reported their instruction being limited “a lot” (39 points in mathematics and 38 points in science).

On average across countries in the eighth grade, about one-fifth of students had teachers reporting their instruction was limited “very little” by students’ readiness to learn (18% in mathematics and 20% in science). Most remaining students had teachers who reported their instruction was limited “some” (73% in mathematics and 71% in science) and a small percentage of students (9% in mathematics and 8% in science) had teachers reporting their instruction was limited “a lot.” Eighth-grade students whose teachers reported their instruction being limited “very little” had the highest average achievement (506 in mathematics and 507 in science— see Exhibits 4.2.19 and 4.2.20). These students had an average achievement advantage of 37 points in mathematics and 32 points in science over students whose teachers reported their instruction was limited “some.” Compared to students whose teachers reported their instruction was limited “a lot,” these students had a 72-point advantage in average mathematics achievement and a 61-point advantage in average science achievement.

Exhibit 4.2.16: Classroom Teaching Limited by Students Not Ready for Instruction – Teachers' Reports

About the Scale

Students were scored according to their teachers' reports regarding nine student attributes on the *Classroom Teaching Limited by Students Not Ready for Instruction* scale. Cut scores divide the scale into three categories. Students with teachers who felt their teaching was limited **Very Little** had a score at or above the cut score corresponding to their teachers reporting they were "not at all" limited by five of the nine student attributes and were limited "some" by the other four, on average. Students with teachers who felt their teaching was limited **A Lot** had a score at or below the cut score corresponding to their teachers reporting they were limited "a lot" by five of the nine attributes and were limited "some" by the other four, on average. All other students had teachers who felt their teaching was limited **Some**.



SOURCE: IEA's Trends in International Mathematics and Science Study - TIMSS 2023
Downloaded from <https://timss2023.org/results>

Exhibit 4.2.17: Classroom Teaching Limited by Students Not Ready for Instruction – Teachers' Reports

Country		Very Little		Some		A Lot		Average Scale Score
		Percent of Students	Average Achievement	Percent of Students	Average Achievement	Percent of Students	Average Achievement	
Albania	r	69 (5.8)	512 (7.3)	26 (5.5)	503 (9.5)	5 (1.8)	498 (16.8)	11.7 (0.29)
Armenia		31 (3.0)	516 (4.5)	64 (3.5)	512 (3.5)	5 (1.6)	500 (10.1)	10.1 (0.11)
Australia	r	16 (2.7)	568 (5.5)	75 (3.2)	525 (3.4)	10 (2.7)	489 (19.3)	9.3 (0.17)
Azerbaijan	r	26 (3.4)	492 (6.9)	66 (3.6)	497 (5.0)	8 (1.7)	477 (11.3)	9.9 (0.18)
Bahrain		35 (3.0)	472 (7.2)	62 (2.9)	459 (5.6)	3 (1.3)	413 (14.7)	10.3 (0.13)
Belgium (Flemish)	r	23 (2.8)	535 (3.7)	73 (3.0)	521 (2.7)	3 (1.2)	498 (17.5)	9.9 (0.13)
Belgium (French)	r	7 (1.7)	522 (9.0)	85 (2.4)	492 (2.5)	8 (1.9)	461 (9.9)	9.0 (0.09)
Bosnia & Herzegovina	r	40 (5.5)	450 (6.9)	57 (5.5)	451 (4.4)	2 ~	~ ~	10.8 (0.21)
Brazil		23 (2.9)	419 (9.9)	69 (3.5)	393 (4.2)	9 (2.0)	407 (15.1)	9.6 (0.12)
Bulgaria		31 (3.4)	560 (6.6)	66 (3.5)	518 (5.3)	4 (1.6)	497 (41.7)	10.4 (0.13)
Canada		11 (1.1)	539 (6.5)	81 (1.7)	502 (2.3)	8 (1.3)	482 (6.8)	9.1 (0.07)
Chile		10 (2.6)	462 (7.6)	78 (3.4)	444 (3.3)	11 (2.6)	423 (12.3)	8.8 (0.17)
Chinese Taipei		14 (2.4)	613 (4.4)	79 (3.0)	607 (1.7)	7 (1.8)	601 (8.5)	9.2 (0.13)
Cyprus		12 (2.0)	533 (5.7)	77 (2.3)	515 (3.0)	11 (1.7)	504 (6.6)	9.2 (0.11)
Czech Republic		45 (2.8)	537 (3.8)	54 (2.8)	525 (2.5)	0 ~	~ ~	11.0 (0.10)
Denmark	r	28 (3.7)	533 (4.4)	71 (3.7)	522 (2.9)	1 ~	~ ~	10.2 (0.14)
England	r	18 (3.1)	592 (9.6)	79 (3.4)	545 (3.7)	2 ~	~ ~	9.9 (0.14)
Finland		24 (2.7)	542 (4.4)	74 (2.8)	528 (2.7)	3 (0.9)	481 (11.7)	10.2 (0.12)
France	r	15 (2.2)	501 (5.4)	78 (2.6)	483 (3.5)	7 (1.9)	468 (10.8)	9.3 (0.11)
Georgia		30 (3.4)	507 (4.9)	65 (3.5)	493 (4.5)	5 (1.6)	511 (6.5)	9.9 (0.14)
Germany		19 (2.9)	548 (4.2)	77 (3.1)	520 (2.4)	4 (1.4)	475 (22.3)	9.7 (0.11)
Hong Kong SAR	r	36 (5.0)	626 (7.7)	63 (5.0)	576 (5.1)	1 ~	~ ~	10.6 (0.17)
Hungary	r	35 (3.3)	542 (5.8)	60 (3.3)	509 (5.6)	4 (1.6)	474 (26.0)	10.4 (0.15)
Iran, Islamic Rep. of		16 (2.6)	429 (8.4)	71 (3.1)	414 (5.3)	13 (2.5)	439 (12.8)	9.1 (0.17)
Ireland		18 (3.0)	561 (4.6)	77 (3.1)	543 (3.5)	5 (1.8)	525 (10.6)	9.9 (0.13)
Italy		22 (2.8)	512 (5.1)	67 (3.4)	515 (3.1)	11 (2.5)	502 (13.0)	9.5 (0.18)
Japan		61 (4.5)	593 (2.8)	38 (4.5)	586 (3.9)	0 ~	~ ~	11.9 (0.18)
Jordan		13 (2.9)	464 (12.2)	71 (3.8)	421 (6.5)	16 (3.3)	425 (15.8)	9.0 (0.19)
Kazakhstan		45 (3.3)	486 (5.1)	50 (3.3)	490 (5.5)	5 (1.3)	471 (17.3)	10.8 (0.17)
Korea, Rep. of		23 (3.9)	610 (5.0)	69 (3.9)	591 (3.4)	8 (2.2)	595 (10.4)	9.6 (0.19)
Kosovo		37 (3.8)	456 (5.3)	62 (3.8)	452 (5.2)	0 ~	~ ~	10.8 (0.11)
Kuwait		15 (3.1)	408 (19.8)	82 (3.3)	379 (5.3)	4 (1.6)	327 (23.7)	9.6 (0.14)
Latvia		28 (3.4)	542 (4.2)	69 (3.5)	532 (3.7)	3 (1.0)	533 (14.2)	10.1 (0.13)
Lithuania		14 (2.6)	576 (7.8)	72 (3.3)	557 (3.7)	14 (2.6)	559 (8.3)	8.9 (0.15)
Macao SAR		16 (0.1)	595 (2.4)	81 (0.1)	580 (1.2)	3 (0.0)	559 (6.6)	9.9 (0.00)
Montenegro		38 (2.9)	479 (3.5)	58 (2.9)	475 (3.0)	4 (1.0)	474 (9.6)	10.7 (0.12)
Morocco		7 (2.1)	397 (23.4)	68 (3.8)	403 (6.3)	25 (3.4)	372 (7.5)	8.3 (0.13)
Netherlands	s	34 (5.2)	546 (4.2)	65 (5.3)	532 (3.8)	1 ~	~ ~	10.5 (0.21)
New Zealand	s	12 (2.9)	530 (12.2)	83 (3.2)	492 (4.0)	5 (1.7)	479 (10.5)	9.3 (0.15)
North Macedonia	r	37 (3.5)	493 (5.9)	58 (3.4)	465 (6.0)	5 (1.9)	478 (16.1)	10.6 (0.16)
Norway (5)	r	15 (2.6)	536 (6.5)	81 (2.7)	531 (2.7)	3 (1.1)	527 (6.3)	9.5 (0.11)
Oman		13 (2.1)	457 (15.5)	67 (2.9)	417 (4.3)	20 (2.6)	413 (9.3)	8.7 (0.15)
Poland		26 (3.3)	552 (4.1)	73 (3.3)	545 (2.5)	1 ~	~ ~	10.3 (0.12)
Portugal		23 (2.9)	536 (5.0)	68 (3.2)	511 (3.7)	9 (2.0)	511 (8.2)	9.7 (0.13)
Qatar		25 (3.0)	491 (7.2)	69 (3.4)	457 (4.4)	5 (1.6)	411 (13.6)	10.0 (0.14)
Romania	r	35 (4.7)	549 (10.7)	62 (4.8)	540 (5.9)	3 (1.0)	519 (34.0)	10.6 (0.21)
Saudi Arabia		7 (2.0)	449 (16.6)	65 (3.6)	419 (5.4)	28 (3.3)	418 (7.9)	8.0 (0.16)
Serbia		32 (3.5)	534 (5.6)	64 (3.6)	517 (3.9)	4 (1.5)	535 (9.5)	10.4 (0.14)
Singapore		34 (2.8)	632 (4.5)	63 (2.8)	607 (3.5)	3 (0.9)	588 (15.9)	10.5 (0.10)
Slovak Republic		31 (3.2)	530 (3.9)	60 (3.1)	509 (4.1)	9 (2.4)	499 (12.3)	9.9 (0.19)
Slovenia		17 (2.6)	513 (3.9)	76 (2.9)	514 (2.1)	7 (1.7)	506 (5.9)	9.5 (0.14)
South Africa (5)		7 (1.9)	371 (17.9)	83 (2.7)	366 (5.3)	10 (2.1)	345 (8.6)	9.0 (0.10)
Spain		35 (2.8)	510 (3.0)	62 (3.0)	493 (2.8)	3 (0.8)	475 (10.9)	10.5 (0.10)
Sweden		28 (4.1)	543 (4.4)	68 (3.9)	526 (3.6)	4 (1.6)	504 (10.6)	10.1 (0.17)
Türkiye (5)		10 (2.4)	610 (7.0)	78 (3.6)	548 (4.6)	13 (2.6)	544 (13.9)	8.8 (0.16)
United Arab Emirates		31 (1.4)	531 (4.5)	64 (1.6)	489 (2.2)	5 (0.7)	451 (11.5)	10.2 (0.06)
United States		9 (1.5)	558 (13.1)	85 (1.8)	516 (3.2)	6 (1.0)	483 (10.1)	9.0 (0.08)
Uzbekistan		46 (4.2)	444 (5.1)	50 (4.2)	441 (4.4)	4 (1.4)	461 (8.6)	11.1 (0.20)
International Average		25 (0.4)	520 (1.1)	68 (0.4)	500 (0.6)	7 (0.2)	481 (2.1)	
Benchmarking Participants								
Ontario, Canada		12 (1.7)	533 (10.9)	81 (2.7)	502 (3.7)	8 (2.0)	479 (13.4)	9.0 (0.10)
Quebec, Canada		11 (2.7)	523 (9.4)	82 (3.4)	514 (3.3)	7 (2.3)	509 (8.8)	9.1 (0.14)
Abu Dhabi, UAE		25 (2.0)	498 (10.1)	67 (2.3)	449 (3.7)	7 (1.8)	429 (13.7)	9.9 (0.11)
Dubai, UAE		34 (2.5)	580 (3.4)	63 (2.5)	552 (2.6)	3 (0.8)	520 (19.8)	10.5 (0.09)
Sharjah, UAE	r	39 (4.3)	533 (4.6)	59 (4.5)	490 (4.1)	2 ~	~ ~	10.5 (0.14)

This TIMSS context questionnaire scale was established in 2015 based on the combined response distribution of countries that participated in TIMSS 2015. To provide a point of reference for country comparisons, the scale centerpoint of 10 was located at the mean of the combined distribution. The units of the scale were chosen so that 2 scale score points corresponded to the standard deviation of the distribution.

() Standard errors appear in parentheses. Because of rounding some results may appear inconsistent.

An "r" indicates data are available for at least 70% but less than 85% of the students.

An "s" indicates data are available for at least 50% but less than 70% of the students.

A tilde (~) indicates insufficient data to report result.

SOURCE: IEA's Trends in International Mathematics and Science Study - TIMSS 2023
Downloaded from <https://timss2023.org/results>

Exhibit 4.2.18: Classroom Teaching Limited by Students Not Ready for Instruction – Teachers' Reports

Country		Very Little		Some		A Lot		Average Scale Score
		Percent of Students	Average Achievement	Percent of Students	Average Achievement	Percent of Students	Average Achievement	
Albania	r	69 (5.4)	491 (7.1)	27 (5.3)	482 (8.6)	4 (1.5)	476 (21.4)	11.8 (0.27)
Armenia		28 (3.6)	462 (4.4)	66 (3.9)	456 (3.4)	6 (1.7)	457 (9.4)	9.9 (0.14)
Australia	r	18 (2.9)	581 (4.0)	73 (3.4)	548 (3.3)	9 (2.7)	527 (15.0)	9.4 (0.18)
Azerbaijan	r	29 (3.5)	424 (6.1)	65 (3.6)	423 (4.1)	5 (1.4)	404 (12.4)	10.1 (0.15)
Bahrain		35 (3.3)	504 (7.6)	63 (3.5)	461 (4.6)	2 ~	~ ~	10.7 (0.12)
Belgium (Flemish)	r	24 (3.2)	508 (4.0)	72 (3.3)	487 (3.0)	3 (1.2)	463 (20.6)	9.9 (0.13)
Belgium (French)	r	7 (1.8)	515 (8.1)	85 (2.6)	484 (2.9)	8 (2.0)	447 (9.1)	9.0 (0.11)
Bosnia & Herzegovina	r	40 (5.5)	452 (5.0)	57 (5.5)	451 (4.8)	2 ~	~ ~	10.8 (0.21)
Brazil		24 (3.2)	450 (10.1)	68 (3.4)	415 (4.4)	8 (1.9)	429 (17.5)	9.7 (0.12)
Bulgaria		32 (3.6)	564 (7.1)	65 (3.7)	512 (7.6)	3 (1.3)	539 (38.5)	10.5 (0.13)
Canada		11 (1.1)	548 (6.6)	82 (1.7)	520 (2.3)	7 (1.3)	503 (6.7)	9.1 (0.07)
Chile		12 (2.9)	490 (7.7)	77 (3.7)	482 (3.3)	11 (2.7)	453 (12.1)	9.0 (0.19)
Chinese Taipei		19 (2.9)	582 (3.6)	74 (3.3)	570 (2.1)	7 (2.0)	566 (4.6)	9.5 (0.14)
Cyprus		15 (2.7)	495 (7.4)	73 (3.1)	486 (3.6)	12 (2.2)	483 (10.0)	9.3 (0.15)
Czech Republic		46 (3.3)	534 (3.6)	54 (3.3)	519 (3.3)	0 ~	~ ~	11.0 (0.10)
Denmark	r	27 (3.6)	535 (3.9)	72 (3.5)	518 (3.4)	1 ~	~ ~	10.2 (0.16)
England	r	19 (3.5)	591 (8.9)	79 (3.7)	551 (3.2)	2 ~	~ ~	10.0 (0.16)
Finland		24 (2.7)	556 (4.0)	73 (2.8)	541 (3.3)	3 (0.9)	480 (14.2)	10.2 (0.11)
France	r	16 (2.1)	503 (5.2)	77 (2.8)	486 (3.8)	7 (2.0)	483 (11.8)	9.3 (0.12)
Georgia		30 (3.6)	471 (4.4)	65 (3.6)	462 (4.5)	5 (1.6)	479 (8.8)	9.8 (0.17)
Germany		21 (2.9)	538 (5.2)	76 (3.1)	512 (3.2)	3 (1.2)	448 (28.8)	9.8 (0.10)
Hong Kong SAR	s	35 (4.2)	565 (8.0)	64 (4.2)	528 (5.2)	1 ~	~ ~	10.6 (0.16)
Hungary	r	34 (3.6)	538 (5.7)	62 (3.6)	518 (4.7)	5 (1.7)	479 (26.1)	10.3 (0.16)
Iran, Islamic Rep. of		16 (2.6)	444 (9.5)	71 (3.1)	426 (5.8)	13 (2.5)	452 (13.5)	9.1 (0.17)
Ireland		18 (3.0)	549 (5.2)	77 (3.1)	530 (3.7)	5 (1.8)	504 (9.1)	9.9 (0.13)
Italy		22 (2.8)	510 (4.5)	67 (3.4)	512 (2.8)	11 (2.5)	502 (12.0)	9.5 (0.18)
Japan		64 (4.5)	558 (2.7)	34 (4.4)	548 (4.1)	2 ~	~ ~	12.1 (0.21)
Jordan		17 (2.8)	448 (11.8)	69 (4.1)	406 (5.4)	13 (3.2)	440 (22.1)	9.2 (0.17)
Kazakhstan		47 (3.4)	471 (5.8)	48 (3.3)	463 (6.1)	5 (1.3)	467 (17.1)	10.9 (0.17)
Korea, Rep. of		25 (3.9)	595 (4.2)	68 (3.9)	581 (3.5)	7 (2.0)	576 (7.1)	9.7 (0.18)
Kosovo		37 (3.8)	409 (5.6)	62 (3.8)	403 (5.1)	0 ~	~ ~	10.8 (0.11)
Kuwait		20 (3.3)	392 (15.4)	75 (3.5)	373 (6.6)	5 (1.9)	293 (30.4)	9.9 (0.14)
Latvia		22 (3.4)	534 (6.1)	75 (3.7)	524 (3.6)	3 (1.3)	517 (12.0)	10.0 (0.14)
Lithuania		14 (2.6)	551 (7.9)	72 (3.3)	534 (3.7)	14 (2.6)	534 (7.6)	8.9 (0.15)
Macao SAR		26 (0.2)	539 (2.4)	74 (0.2)	535 (1.5)	0 ~	~ ~	10.2 (0.01)
Montenegro		38 (2.9)	464 (3.8)	58 (2.9)	458 (3.2)	4 (1.0)	459 (7.9)	10.7 (0.12)
Morocco		7 (2.1)	389 (26.0)	67 (3.8)	399 (7.1)	25 (3.4)	373 (8.7)	8.3 (0.13)
Netherlands	s	34 (5.2)	528 (4.6)	65 (5.3)	512 (4.5)	1 ~	~ ~	10.5 (0.21)
New Zealand	s	12 (3.2)	554 (9.3)	83 (3.4)	520 (4.4)	5 (1.6)	505 (13.0)	9.3 (0.15)
North Macedonia	r	37 (3.6)	462 (6.2)	58 (3.5)	428 (6.6)	5 (1.9)	445 (19.0)	10.6 (0.16)
Norway (5)	r	15 (2.9)	535 (7.8)	81 (2.9)	532 (2.9)	4 (1.2)	534 (6.1)	9.5 (0.12)
Oman		14 (2.1)	454 (13.1)	68 (2.7)	434 (5.1)	18 (2.5)	411 (6.6)	8.9 (0.15)
Poland		34 (3.6)	553 (3.7)	65 (3.6)	549 (2.8)	1 ~	~ ~	10.7 (0.14)
Portugal		23 (2.9)	527 (4.3)	68 (3.2)	505 (2.8)	9 (2.0)	505 (7.1)	9.7 (0.13)
Qatar		26 (3.1)	500 (6.8)	71 (3.1)	462 (4.3)	3 (1.0)	428 (12.1)	10.2 (0.13)
Romania	s	40 (5.5)	546 (7.6)	55 (5.6)	526 (6.3)	5 (2.0)	518 (19.5)	10.4 (0.21)
Saudi Arabia		11 (2.1)	437 (9.6)	63 (3.6)	427 (5.8)	25 (3.3)	421 (8.3)	8.1 (0.17)
Serbia		32 (3.5)	520 (5.1)	64 (3.6)	504 (3.6)	4 (1.5)	518 (9.5)	10.4 (0.14)
Singapore		37 (3.0)	629 (3.6)	61 (3.0)	596 (3.6)	2 ~	~ ~	10.7 (0.10)
Slovak Republic		33 (3.1)	541 (3.3)	60 (3.2)	512 (4.3)	7 (1.8)	501 (14.8)	10.1 (0.16)
Slovenia		17 (2.6)	527 (4.4)	76 (2.9)	526 (2.5)	7 (1.7)	519 (7.7)	9.5 (0.14)
South Africa (5)	r	6 (1.6)	327 (37.0)	87 (2.2)	308 (6.8)	7 (1.9)	292 (14.3)	9.1 (0.11)
Spain		35 (2.9)	513 (3.3)	62 (3.1)	500 (2.6)	3 (0.9)	469 (9.7)	10.4 (0.11)
Sweden	r	30 (4.1)	540 (5.6)	68 (4.1)	531 (4.4)	2 ~	~ ~	10.1 (0.15)
Türkiye (5)		14 (3.0)	601 (8.2)	76 (3.9)	566 (3.5)	10 (2.8)	561 (14.1)	9.2 (0.14)
United Arab Emirates		32 (1.3)	536 (3.9)	63 (1.5)	481 (3.0)	4 (0.7)	437 (12.4)	10.4 (0.06)
United States		8 (1.4)	558 (12.9)	86 (1.8)	533 (3.0)	6 (1.1)	495 (9.6)	9.1 (0.08)
Uzbekistan		49 (4.4)	412 (5.3)	46 (4.5)	409 (4.5)	5 (1.5)	421 (10.0)	11.2 (0.21)
International Average		26 (0.4)	509 (1.2)	67 (0.5)	491 (0.6)	6 (0.2)	471 (2.3)	
Benchmarking Participants								
Ontario, Canada		12 (1.8)	545 (9.6)	81 (2.7)	525 (3.6)	6 (1.9)	511 (13.1)	9.0 (0.11)
Quebec, Canada		11 (3.0)	518 (10.8)	83 (3.5)	507 (3.1)	6 (2.1)	491 (11.2)	9.2 (0.14)
Abu Dhabi, UAE		25 (2.5)	506 (9.2)	68 (2.6)	431 (4.9)	7 (1.8)	410 (18.1)	9.9 (0.11)
Dubai, UAE		39 (2.4)	587 (3.2)	58 (2.6)	554 (3.7)	3 (0.9)	502 (16.5)	10.8 (0.13)
Sharjah, UAE	r	37 (3.6)	536 (6.9)	61 (3.5)	487 (6.1)	1 ~	~ ~	10.7 (0.13)

This TIMSS context questionnaire scale was established in 2015 based on the combined response distribution of countries that participated in TIMSS 2015. To provide a point of reference for country comparisons, the scale centerpoint of 10 was located at the mean of the combined distribution. The units of the scale were chosen so that 2 scale score points corresponded to the standard deviation of the distribution.

() Standard errors appear in parentheses. Because of rounding some results may appear inconsistent.

An "r" indicates data are available for at least 70% but less than 85% of the students.

An "s" indicates data are available for at least 50% but less than 70% of the students.

A tilde (~) indicates insufficient data to report result.

SOURCE: IEA's Trends in International Mathematics and Science Study - TIMSS 2023
Downloaded from <https://timss2023.org/results>

Exhibit 4.2.19: Classroom Teaching Limited by Students Not Ready for Instruction – Teachers' Reports

Country	Very Little		Some		A Lot		Average Scale Score
	Percent of Students	Average Achievement	Percent of Students	Average Achievement	Percent of Students	Average Achievement	
Australia	17 (2.6)	576 (6.6)	71 (3.4)	508 (5.6)	12 (3.1)	483 (11.7)	9.6 (0.18)
Austria	27 (3.2)	539 (4.4)	71 (3.3)	510 (3.5)	2 ~	~ ~	10.6 (0.10)
Azerbaijan	26 (3.3)	477 (7.0)	71 (3.3)	479 (5.3)	3 (0.9)	516 (16.6)	10.3 (0.13)
Bahrain	19 (3.1)	480 (12.0)	78 (3.5)	414 (3.6)	3 (1.5)	400 (29.2)	9.9 (0.14)
Brazil	11 (2.0)	419 (7.3)	74 (2.8)	376 (4.2)	15 (2.2)	364 (4.8)	9.2 (0.13)
Chile	6 (2.1)	439 (14.2)	78 (3.8)	418 (3.9)	16 (3.6)	402 (10.0)	8.9 (0.15)
Chinese Taipei	11 (2.4)	632 (10.6)	71 (3.5)	600 (3.8)	18 (3.0)	587 (8.7)	9.2 (0.16)
Cote d'Ivoire	11 (2.6)	271 (13.8)	79 (3.7)	263 (6.0)	11 (2.7)	261 (10.0)	9.3 (0.16)
Cyprus	12 (2.4)	513 (8.3)	82 (2.5)	493 (3.1)	6 (1.5)	455 (8.4)	9.7 (0.12)
Czech Republic	33 (2.9)	542 (4.3)	67 (3.0)	507 (3.1)	1 ~	~ ~	11.0 (0.09)
England	22 (4.1)	586 (11.7)	71 (4.5)	504 (5.8)	7 (3.1)	459 (23.1)	10.1 (0.19)
Finland	20 (2.2)	533 (6.5)	77 (2.3)	498 (2.8)	3 (0.9)	465 (19.2)	10.2 (0.09)
France	16 (2.9)	518 (6.1)	75 (3.5)	478 (3.8)	8 (2.0)	429 (11.7)	9.8 (0.14)
Georgia	12 (2.3)	481 (9.4)	82 (2.8)	466 (3.8)	6 (1.7)	450 (11.6)	9.6 (0.13)
Hong Kong SAR	24 (3.7)	614 (15.4)	74 (3.7)	563 (7.3)	1 ~	~ ~	10.4 (0.11)
Hungary	25 (3.2)	538 (8.2)	71 (3.4)	500 (4.4)	3 (1.1)	409 (19.2)	10.6 (0.12)
Iran, Islamic Rep. of	12 (2.1)	459 (14.2)	73 (3.0)	419 (4.2)	15 (2.4)	414 (7.6)	9.2 (0.12)
Ireland	14 (1.7)	555 (6.0)	83 (1.9)	520 (3.0)	3 (0.8)	478 (11.6)	10.0 (0.10)
Israel	13 (2.2)	542 (14.1)	64 (3.1)	492 (5.8)	23 (2.5)	446 (10.6)	8.9 (0.12)
Italy	17 (2.7)	512 (5.0)	75 (2.9)	499 (3.8)	8 (1.9)	489 (9.6)	9.8 (0.12)
Japan	55 (4.6)	600 (4.7)	45 (4.6)	588 (3.2)	0 ~	~ ~	12.2 (0.22)
Jordan	7 (2.0)	372 (11.0)	83 (3.0)	388 (3.6)	10 (2.3)	403 (12.8)	9.1 (0.12)
Kazakhstan	34 (3.5)	464 (6.9)	62 (3.4)	451 (4.5)	4 (1.5)	430 (16.3)	10.8 (0.19)
Korea, Rep. of	15 (2.6)	595 (7.7)	73 (3.6)	597 (3.8)	12 (2.7)	594 (8.6)	9.5 (0.15)
Kuwait	15 (3.0)	445 (20.6)	80 (3.5)	392 (5.8)	5 (2.0)	367 (12.2)	9.9 (0.13)
Lithuania	6 (1.8)	542 (18.7)	77 (3.1)	512 (4.1)	16 (3.0)	515 (6.6)	8.8 (0.15)
Malaysia	21 (2.3)	460 (6.4)	72 (2.6)	402 (4.4)	7 (1.5)	355 (9.7)	10.0 (0.11)
Malta	16 (0.1)	554 (3.1)	78 (0.1)	496 (1.5)	5 (0.1)	436 (5.9)	9.9 (0.01)
Morocco	2 ~	~ ~	56 (3.4)	377 (4.5)	42 (3.4)	378 (4.7)	7.6 (0.12)
Norway (9)	9 (2.2)	510 (6.2)	83 (2.8)	504 (2.7)	7 (1.8)	477 (5.9)	9.4 (0.13)
Oman	15 (2.1)	426 (6.7)	74 (2.9)	410 (3.4)	12 (2.3)	399 (6.3)	9.4 (0.13)
Palestinian Nat'l Auth.	3 (1.4)	376 (14.1)	77 (3.3)	383 (3.4)	19 (3.2)	383 (7.5)	8.6 (0.15)
Portugal	9 (1.8)	527 (6.7)	76 (2.5)	474 (3.1)	14 (2.3)	455 (10.0)	9.2 (0.13)
Qatar	23 (3.7)	482 (12.5)	70 (4.1)	444 (6.1)	7 (2.5)	415 (15.4)	10.2 (0.17)
Romania	24 (3.4)	524 (13.2)	74 (3.5)	493 (6.3)	1 ~	~ ~	10.5 (0.19)
Saudi Arabia	9 (2.0)	421 (17.3)	70 (3.5)	394 (4.1)	21 (3.1)	398 (7.9)	8.8 (0.15)
Singapore	33 (3.8)	645 (6.1)	65 (3.8)	587 (8.3)	2 ~	~ ~	10.9 (0.13)
South Africa (9)	4 (1.4)	468 (22.9)	84 (2.9)	395 (3.9)	13 (2.6)	383 (8.5)	8.8 (0.12)
Sweden	12 (2.1)	549 (10.8)	86 (2.3)	512 (2.4)	2 ~	~ ~	9.9 (0.10)
Türkiye	16 (2.9)	576 (13.3)	71 (3.1)	500 (5.9)	13 (1.5)	474 (9.8)	9.3 (0.13)
United Arab Emirates	26 (1.4)	525 (4.8)	69 (1.5)	476 (2.6)	4 (0.6)	411 (13.2)	10.4 (0.06)
United States	12 (2.0)	554 (14.7)	79 (2.3)	486 (4.5)	9 (1.5)	427 (7.3)	9.5 (0.10)
Uzbekistan	35 (4.1)	428 (9.6)	61 (4.0)	417 (4.2)	5 (1.6)	429 (11.9)	10.7 (0.21)
International Average	18 (0.4)	506 (1.7)	73 (0.5)	469 (0.7)	9 (0.3)	434 (2.1)	
Benchmarking Participants							
Abu Dhabi, UAE	21 (1.9)	492 (7.4)	73 (2.4)	445 (3.8)	7 (1.5)	380 (14.3)	10.0 (0.12)
Dubai, UAE	33 (2.6)	578 (5.5)	65 (2.6)	536 (4.9)	2 ~	~ ~	10.8 (0.09)
Sharjah, UAE	31 (3.8)	523 (11.0)	66 (3.8)	480 (5.1)	3 (0.9)	428 (11.1)	10.7 (0.15)

This TIMSS context questionnaire scale was established in 2015 based on the combined response distribution of countries that participated in TIMSS 2015. To provide a point of reference for country comparisons, the scale centerpoint of 10 was located at the mean of the combined distribution. The units of the scale were chosen so that 2 scale score points corresponded to the standard deviation of the distribution.

() Standard errors appear in parentheses. Because of rounding some results may appear inconsistent.

An "r" indicates data are available for at least 70% but less than 85% of the students.

An "s" indicates data are available for at least 50% but less than 70% of the students.

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Downloaded from <https://timss2023.org/results>

Exhibit 4.2.20: Classroom Teaching Limited by Students Not Ready for Instruction – Teachers' Reports

Country		Very Little		Some		A Lot		Average Scale Score
		Percent of Students	Average Achievement	Percent of Students	Average Achievement	Percent of Students	Average Achievement	
Australia	s	15 (2.5)	562 (6.7)	73 (3.7)	522 (4.6)	12 (3.2)	498 (8.0)	9.7 (0.16)
Austria		27 (2.1)	542 (3.3)	70 (2.1)	506 (3.5)	3 (0.7)	442 (12.8)	10.5 (0.08)
Azerbaijan	r	31 (2.0)	408 (4.4)	65 (2.0)	412 (3.5)	4 (0.8)	404 (7.8)	10.6 (0.10)
Bahrain		32 (4.0)	472 (6.1)	67 (4.2)	443 (3.6)	1 ~	~ ~	10.6 (0.13)
Brazil		14 (2.7)	466 (14.4)	73 (2.8)	410 (4.3)	14 (2.0)	423 (6.1)	9.4 (0.16)
Chile		5 (1.5)	527 (6.8)	80 (3.3)	453 (3.7)	15 (2.9)	442 (8.2)	8.9 (0.14)
Chinese Taipei		18 (3.0)	606 (7.1)	73 (3.4)	566 (2.8)	9 (2.4)	553 (8.2)	9.5 (0.18)
Cyprus		16 (1.7)	482 (7.6)	75 (1.7)	461 (3.4)	8 (0.9)	443 (5.5)	9.8 (0.07)
Czech Republic		33 (1.6)	543 (2.6)	67 (1.7)	519 (2.6)	0 ~	~ ~	11.1 (0.06)
England	s	15 (3.7)	574 (11.1)	78 (4.9)	526 (6.4)	7 (3.4)	485 (31.6)	9.7 (0.21)
Finland		23 (1.6)	555 (4.7)	74 (1.6)	525 (3.2)	3 (0.5)	492 (10.2)	10.4 (0.07)
France		13 (2.1)	519 (6.2)	82 (2.5)	485 (3.4)	5 (1.4)	462 (9.9)	9.8 (0.12)
Georgia		14 (1.3)	456 (4.4)	77 (1.6)	447 (3.2)	9 (1.1)	447 (4.4)	9.6 (0.07)
Hong Kong SAR	s	22 (4.2)	560 (10.9)	76 (4.3)	527 (9.1)	1 ~	~ ~	10.4 (0.16)
Hungary	r	27 (2.0)	538 (4.9)	70 (2.1)	519 (3.7)	3 (0.7)	470 (12.5)	10.5 (0.09)
Iran, Islamic Rep. of		15 (2.3)	428 (13.6)	75 (2.8)	418 (3.8)	11 (2.0)	404 (12.6)	9.5 (0.14)
Ireland		16 (1.7)	544 (4.6)	81 (2.0)	527 (4.7)	3 (1.2)	494 (16.9)	10.1 (0.10)
Israel		12 (2.4)	528 (15.1)	67 (3.1)	486 (4.6)	21 (2.5)	441 (8.0)	9.0 (0.15)
Italy		19 (2.9)	501 (10.4)	75 (3.2)	501 (3.7)	6 (1.7)	489 (12.4)	9.9 (0.13)
Japan		59 (4.5)	563 (3.9)	40 (4.5)	549 (5.3)	1 ~	~ ~	12.2 (0.17)
Jordan		11 (2.5)	413 (11.5)	80 (3.0)	412 (3.9)	9 (1.9)	408 (13.1)	9.4 (0.17)
Kazakhstan		40 (2.0)	450 (4.0)	56 (2.0)	437 (3.3)	4 (0.7)	443 (7.2)	11.2 (0.11)
Korea, Rep. of		21 (2.8)	545 (5.3)	69 (3.1)	548 (2.8)	10 (2.2)	533 (7.3)	9.9 (0.17)
Kuwait		15 (3.1)	483 (18.2)	82 (3.4)	411 (6.0)	3 (1.4)	368 (21.1)	10.0 (0.12)
Lithuania		9 (1.2)	535 (5.5)	74 (1.9)	518 (3.4)	16 (1.6)	513 (4.3)	9.1 (0.09)
Malaysia		26 (2.6)	480 (5.9)	67 (2.7)	412 (4.3)	7 (1.5)	360 (14.4)	10.2 (0.13)
Malta	r	24 (0.5)	541 (3.0)	66 (0.6)	504 (1.9)	10 (0.3)	434 (5.3)	10.1 (0.03)
Morocco		2 ~	~ ~	71 (2.5)	326 (4.1)	26 (2.4)	327 (7.3)	8.1 (0.10)
Norway (9)	r	14 (2.9)	505 (8.5)	79 (3.1)	491 (2.7)	6 (1.7)	472 (7.3)	9.8 (0.14)
Oman		16 (2.3)	467 (6.7)	72 (2.7)	455 (3.4)	12 (2.1)	442 (7.1)	9.5 (0.14)
Palestinian Nat'l Auth.		5 (1.7)	416 (11.7)	80 (2.8)	394 (3.2)	15 (2.4)	377 (7.5)	8.9 (0.12)
Portugal		13 (1.6)	535 (5.8)	74 (2.3)	504 (2.7)	14 (1.6)	489 (7.5)	9.4 (0.09)
Qatar		24 (2.8)	511 (8.8)	72 (3.3)	474 (4.8)	4 (1.7)	434 (13.8)	10.5 (0.14)
Romania	r	29 (3.4)	479 (6.5)	68 (3.3)	467 (4.2)	3 (1.3)	473 (8.7)	10.6 (0.14)
Saudi Arabia		11 (2.3)	455 (11.9)	65 (3.6)	414 (4.5)	24 (3.1)	418 (8.1)	8.8 (0.17)
Singapore		39 (3.5)	644 (5.6)	58 (3.7)	588 (6.7)	3 (1.2)	450 (22.3)	11.1 (0.14)
South Africa (9)	r	7 (2.0)	386 (18.4)	83 (2.9)	365 (5.5)	10 (2.1)	354 (11.9)	9.2 (0.12)
Sweden		18 (2.8)	549 (8.6)	80 (3.0)	518 (3.4)	2 ~	~ ~	10.1 (0.10)
Türkiye		17 (3.0)	583 (9.7)	68 (3.9)	525 (4.3)	15 (2.7)	490 (7.9)	9.4 (0.19)
United Arab Emirates		29 (1.5)	517 (5.1)	67 (1.6)	472 (3.3)	4 (0.7)	453 (14.5)	10.6 (0.06)
United States		10 (2.2)	532 (17.3)	79 (2.5)	516 (4.8)	11 (2.0)	492 (10.5)	9.2 (0.14)
Uzbekistan		43 (2.5)	402 (5.6)	51 (2.5)	391 (3.3)	6 (1.2)	389 (7.7)	11.1 (0.14)
International Average		20 (0.4)	507 (1.4)	71 (0.5)	475 (0.7)	8 (0.3)	446 (1.9)	
Cote d'Ivoire	x	8 (1.9)	263 (35.2)	77 (3.8)	164 (5.1)	15 (3.0)	239 (28.6)	9.1 (0.13)
Benchmarking Participants								
Abu Dhabi, UAE		24 (2.0)	498 (9.3)	72 (2.3)	426 (5.4)	4 (1.1)	386 (16.5)	10.3 (0.08)
Dubai, UAE		31 (2.6)	571 (7.0)	64 (2.8)	538 (3.9)	4 (1.2)	536 (20.4)	10.8 (0.10)
Sharjah, UAE	r	31 (4.1)	516 (11.1)	65 (4.3)	482 (6.2)	4 (1.4)	470 (35.8)	10.8 (0.18)

This TIMSS context questionnaire scale was established in 2015 based on the combined response distribution of countries that participated in TIMSS 2015. To provide a point of reference for country comparisons, the scale centerpoint of 10 was located at the mean of the combined distribution. The units of the scale were chosen so that 2 scale score points corresponded to the standard deviation of the distribution.

() Standard errors appear in parentheses. Because of rounding some results may appear inconsistent.

An "s" indicates data are available for at least 70% but less than 85% of the students.

An "r" indicates data are available for at least 50% but less than 70% of the students.

An "x" indicates data are available for at least 40% but less than 50% of the students—interpret with caution.

A tilde (~) indicates insufficient data to report result.

SOURCE: IEA's Trends in International Mathematics and Science Study - TIMSS 2023
Downloaded from <https://timss2023.org/results>

Classroom Environment

Teacher Qualifications

Teachers' Formal Education – Teachers' Reports

Internationally, a large majority of fourth- and eighth-grade students were taught mathematics and science by teachers who completed at least a bachelor's or equivalent degree. However, there is variation in this across countries, as teachers' attained credentials are related to country-level policies. More information about this can be found in the *TIMSS 2023 Encyclopedia*. The TIMSS 2023 Teacher Questionnaire collected information about teachers' education qualifications (Exhibit 5.1.1). These are reported in four categories: completed postgraduate university degree, completed a bachelor's degree or equivalent, completed post-secondary education but not a bachelor's degree, or completed no further than upper-secondary education.

Internationally, on average, 33 percent of fourth-grade students had mathematics teachers with a postgraduate university degree, 58 percent had teachers with a bachelor's degree, 6 percent had teachers who had completed post-secondary education, and 3 percent had teachers who completed upper-secondary education (Exhibit 5.1.2). There is a great degree of variation in these percentages across countries. For example, seven countries had 90 percent or more of students with mathematics teachers having a bachelor's or equivalent degree, while seven additional countries had fewer than 10 percent of students with mathematics teachers having this as their highest level of education. The results are very similar for fourth-grade students' science teachers, who may be the same individuals as students' mathematics teachers, depending on how a country organizes fourth-grade instruction. On average, 34 percent of fourth-grade students had science teachers with a postgraduate university degree, 58 percent had teachers with a bachelor's degree, 6 percent had teachers with some post-secondary education, and 3 percent had teachers who completed upper-secondary education (Exhibit 5.1.3). As with mathematics, there is considerable variation in these percentages across countries. Seven countries had 90 percent or more of students with teachers having a bachelor's degree or equivalent and seven additional countries had fewer than 10 percent of students with mathematics teachers having this as their highest level of education.

The eighth-grade results also show considerable variation across countries for both subjects. On average, 39 percent of eighth-grade students had mathematics teachers with a postgraduate university degree and 57 percent had mathematics teachers with a bachelor's degree (Exhibit 5.1.4). Ten countries had 80 percent or more of students with mathematics teachers who completed a bachelor's or equivalent degree and three countries had fewer than 10 percent of students with mathematics teachers having this

as their highest level of education. Forty-one percent of students had science teachers with a postgraduate university degree, and 56 percent had science teachers with a bachelor's degree (Exhibit 5.1.5). Eleven countries had 80 percent or more of students with science teachers having a bachelor's degree or equivalent and four countries had fewer than 10 percent of students with teachers having this as their highest level of education.

Exhibit 5.1.1: Teachers' Formal Education – Teachers' Reports

About the Item	
What is the highest level of formal education you have completed?	
Did not complete <Upper-secondary education—ISCED Level 3> ---	☐
<Upper-secondary education—ISCED Level 3> ---	☐
<Post-secondary, non-tertiary education—ISCED Level 4> ---	☐
<Short-cycle tertiary education—ISCED Level 5> ---	☐
<Bachelor's or equivalent level—ISCED Level 6> ---	☐
<Master's or equivalent level—ISCED Level 7> ---	☐
<Doctor or equivalent level—ISCED Level 8> ---	☐
Completed Postgraduate University Degree: Completed ISCED Level 7 or higher, including Master's, Doctorate, or other postgraduate degree Completed Bachelor's Degree or Equivalent but Not a Postgraduate Degree: Completed ISCED Level 6 Completed Post-Secondary Education but Not a Bachelor's Degree: Completed ISCED Level 4 or ISCED Level 5 No Further than Upper-Secondary Education: Completed no higher than ISCED Level 3 < > Item translated based on countries' categorizations according to UNESCO's International Standard Classification of Education (Operational Manual for ISCED 2011)	

SOURCE: IEA's Trends in International Mathematics and Science Study - TIMSS 2023
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Exhibit 5.1.2: Teachers' Formal Education – Teachers' Reports

Country	Percent of Students by Teacher Education Level*			
	Completed Postgraduate University Degree**	Completed Bachelor's Degree or Equivalent but Not a Postgraduate Degree	Completed Post-Secondary Education but Not a Bachelor's Degree	No Further than Upper-Secondary Education
Albania	r 60 (5.4)	25 (4.2)	3 (2.1)	11 (3.4)
Armenia	41 (4.3)	44 (4.1)	10 (2.1)	5 (1.9)
Australia	r 21 (3.4)	77 (3.6)	2 ~	0 ~
Azerbaijan	r 14 (2.4)	51 (3.8)	32 (3.5)	3 (1.3)
Bahrain	21 (2.4)	78 (2.6)	1 ~	1 ~
Belgium (Flemish)	r 3 (1.3)	97 (1.3)	0 ~	0 ~
Belgium (French)	8 (1.6)	91 (1.7)	0 ~	2 ~
Bosnia & Herzegovina	r 9 (2.5)	65 (4.4)	26 (4.0)	0 ~
Brazil	3 (0.9)	91 (1.7)	0 ~	6 (1.4)
Bulgaria	70 (3.2)	23 (2.9)	8 (1.5)	0 ~
Canada	16 (1.5)	84 (1.5)	0 ~	0 ~
Chile	11 (2.6)	89 (2.6)	0 ~	0 ~
Chinese Taipei	56 (3.5)	44 (3.5)	0 ~	0 ~
Cyprus	63 (3.2)	35 (3.2)	2 ~	0 ~
Czech Republic	92 (1.7)	4 (1.4)	1 ~	3 (1.0)
Denmark	5 (1.3)	89 (2.4)	2 ~	5 (1.4)
England	r 64 (3.9)	33 (3.7)	0 ~	2 ~
Finland	90 (2.0)	6 (1.7)	1 ~	2 ~
France	r 53 (3.8)	41 (4.0)	5 (1.7)	1 ~
Georgia	74 (3.2)	22 (3.1)	2 ~	1 ~
Germany	r 93 (1.9)	1 ~	4 (1.2)	2 ~
Hong Kong SAR	r 32 (4.1)	66 (4.2)	2 ~	0 ~
Hungary	r 9 (2.5)	91 (2.5)	0 ~	0 ~
Iran, Islamic Rep. of	20 (2.8)	61 (3.3)	14 (2.5)	5 (1.4)
Ireland	40 (3.4)	57 (3.6)	3 (1.8)	0 ~
Italy	37 (3.1)	7 (1.4)	4 (1.5)	52 (3.2)
Japan	5 (1.5)	91 (2.0)	4 (1.6)	0 ~
Jordan	11 (2.5)	80 (3.5)	3 (1.6)	5 (2.0)
Kazakhstan	6 (1.7)	83 (2.5)	7 (1.6)	4 (1.0)
Korea, Rep. of	33 (3.9)	67 (3.9)	0 ~	0 ~
Kosovo	11 (1.9)	83 (2.5)	4 (1.8)	1 ~
Kuwait	10 (2.4)	85 (2.2)	4 (1.5)	1 ~
Latvia	41 (3.8)	55 (3.9)	1 ~	3 (1.2)
Lithuania	23 (3.0)	71 (3.2)	4 (1.3)	1 ~
Macao SAR	17 (0.1)	80 (0.1)	4 (0.1)	0 ~
Montenegro	76 (2.8)	6 (1.6)	18 (2.4)	0 ~
Morocco	r 12 (2.8)	58 (4.5)	7 (1.7)	24 (3.6)
Netherlands	s 10 (2.9)	80 (4.1)	9 (2.9)	0 ~
New Zealand	s 42 (3.5)	52 (3.9)	6 (2.0)	0 ~
North Macedonia	r 7 (1.7)	71 (3.2)	20 (3.0)	1 ~
Norway (5)	r 43 (3.8)	57 (3.8)	0 ~	0 ~
Oman	5 (1.3)	93 (1.6)	2 ~	1 ~
Poland	96 (1.5)	4 (1.4)	0 ~	0 ~
Portugal	22 (2.8)	75 (3.0)	4 (1.1)	0 ~
Qatar	30 (2.7)	67 (2.8)	2 ~	1 ~
Romania	r 31 (4.4)	51 (4.4)	11 (2.4)	7 (2.6)
Saudi Arabia	6 (1.6)	84 (2.8)	8 (2.3)	2 ~
Serbia	24 (3.1)	60 (3.7)	15 (2.4)	0 ~
Singapore	17 (2.1)	75 (2.3)	7 (1.4)	1 ~
Slovak Republic	98 (0.9)	1 ~	1 ~	0 ~
Slovenia	74 (2.7)	9 (1.8)	17 (2.1)	0 ~
South Africa (5)	s 18 (3.4)	40 (3.9)	27 (3.9)	15 (3.2)
Spain	25 (2.4)	74 (2.3)	0 ~	0 ~
Sweden	15 (2.8)	79 (3.5)	6 (1.8)	1 ~
Türkiye (5)	10 (2.3)	90 (2.3)	0 ~	0 ~
United Arab Emirates	32 (1.5)	66 (1.5)	2 ~	0 ~
United States	57 (2.3)	43 (2.3)	0 ~	0 ~
Uzbekistan	7 (2.2)	71 (3.9)	19 (3.3)	2 ~
International Average	33 (0.4)	58 (0.4)	6 (0.2)	3 (0.2)
Benchmarking Participants				
Ontario, Canada	19 (2.2)	81 (2.3)	0 ~	0 ~
Quebec, Canada	10 (2.4)	90 (2.4)	0 ~	0 ~
Abu Dhabi, UAE	33 (2.3)	66 (2.3)	1 ~	0 ~
Dubai, UAE	37 (2.9)	62 (2.9)	0 ~	0 ~
Sharjah, UAE	31 (3.3)	66 (3.4)	3 (0.6)	0 ~

* Based on countries' categorizations according to UNESCO's International Standard Classification of Education (Operational Manual for ISCED 2011)

** For example, doctorate, master's, or other postgraduate degree.

() Standard errors appear in parentheses. Because of rounding some results may appear inconsistent.

An "r" indicates data are available for at least 70% but less than 85% of the students.

An "s" indicates data are available for at least 50% but less than 70% of the students.

A tilde (~) indicates insufficient data to report result.

SOURCE: IEA's Trends in International Mathematics and Science Study - TIMSS 2023
Downloaded from <https://timss2023.org/results>

Exhibit 5.1.3: Teachers' Formal Education – Teachers' Reports

Country		Percent of Students by Teacher Education Level*			
		Completed Postgraduate University Degree**	Completed Bachelor's Degree or Equivalent but Not a Postgraduate Degree	Completed Post-Secondary Education but Not a Bachelor's Degree	No Further than Upper-Secondary Education
Albania	r	60 (5.6)	25 (4.2)	3 (2.1)	12 (3.8)
Armenia		38 (4.2)	46 (4.0)	13 (3.0)	3 (1.2)
Australia	r	21 (3.4)	78 (3.5)	1 ~	0 ~
Azerbaijan	r	13 (2.2)	53 (3.5)	31 (3.2)	3 (1.3)
Bahrain		17 (3.1)	83 (3.1)	1 ~	0 ~
Belgium (Flemish)	r	3 (1.3)	97 (1.3)	0 ~	0 ~
Belgium (French)		7 (1.6)	92 (1.7)	0 ~	1 ~
Bosnia & Herzegovina	r	9 (2.5)	65 (4.4)	26 (4.0)	0 ~
Brazil		3 (0.9)	92 (1.8)	0 ~	5 (1.4)
Bulgaria		72 (3.1)	21 (2.8)	7 (1.4)	0 ~
Canada		15 (1.4)	84 (1.4)	0 ~	1 ~
Chile		8 (2.3)	92 (2.3)	0 ~	0 ~
Chinese Taipei		60 (3.4)	40 (3.4)	0 ~	0 ~
Cyprus		73 (3.4)	27 (3.4)	0 ~	0 ~
Czech Republic		90 (2.3)	5 (1.4)	1 ~	4 (1.7)
Denmark	r	9 (1.9)	81 (3.0)	3 (1.5)	7 (2.2)
England	r	62 (4.5)	35 (4.2)	0 ~	2 ~
Finland		92 (1.9)	6 (1.6)	1 ~	2 ~
France	r	55 (3.8)	39 (4.2)	5 (1.8)	1 ~
Georgia		74 (3.5)	23 (3.3)	2 ~	1 ~
Germany	r	94 (1.5)	1 ~	4 (1.1)	1 ~
Hong Kong SAR	s	35 (4.4)	64 (4.4)	1 ~	0 ~
Hungary	r	9 (2.5)	91 (2.5)	0 ~	0 ~
Iran, Islamic Rep. of		20 (2.8)	61 (3.3)	14 (2.5)	5 (1.4)
Ireland		40 (3.4)	57 (3.6)	3 (1.8)	0 ~
Italy		37 (3.1)	7 (1.4)	4 (1.5)	52 (3.2)
Japan		6 (1.9)	92 (2.2)	2 ~	0 ~
Jordan		8 (2.0)	88 (2.4)	1 ~	3 (1.5)
Kazakhstan		6 (1.7)	81 (2.8)	10 (2.2)	3 (1.0)
Korea, Rep. of		35 (3.9)	65 (3.9)	0 ~	0 ~
Kosovo		11 (1.9)	83 (2.5)	4 (1.8)	1 ~
Kuwait		14 (2.9)	85 (3.1)	1 ~	0 ~
Latvia		45 (4.1)	50 (4.1)	3 (1.0)	2 ~
Lithuania		23 (3.0)	71 (3.2)	4 (1.3)	1 ~
Macao SAR		21 (0.2)	74 (0.2)	4 (0.1)	0 ~
Montenegro		76 (2.8)	6 (1.6)	18 (2.4)	0 ~
Morocco	r	11 (2.7)	60 (4.5)	7 (1.8)	22 (3.5)
Netherlands	s	10 (2.9)	80 (4.1)	9 (2.9)	0 ~
New Zealand	s	41 (3.5)	53 (3.9)	6 (2.0)	0 ~
North Macedonia	r	8 (1.7)	71 (3.2)	20 (3.0)	1 ~
Norway (5)	r	49 (3.6)	49 (3.7)	0 ~	1 ~
Oman		8 (1.7)	90 (1.9)	2 ~	0 ~
Poland		98 (1.1)	2 ~	0 ~	0 ~
Portugal		22 (2.7)	75 (2.8)	4 (1.1)	0 ~
Qatar		29 (3.0)	68 (3.0)	3 (1.0)	0 ~
Romania	r	31 (4.4)	53 (4.2)	10 (2.4)	6 (2.4)
Saudi Arabia		4 (1.4)	88 (2.4)	7 (1.9)	2 ~
Serbia		24 (3.1)	60 (3.7)	15 (2.4)	0 ~
Singapore		21 (2.1)	75 (2.3)	4 (0.9)	0 ~
Slovak Republic		97 (1.4)	2 ~	1 ~	1 ~
Slovenia		74 (2.7)	9 (1.8)	17 (2.1)	0 ~
South Africa (5)	s	18 (3.2)	37 (3.7)	28 (3.7)	16 (3.4)
Spain		28 (2.7)	72 (2.7)	0 ~	0 ~
Sweden		16 (3.1)	74 (3.7)	7 (1.7)	3 (1.4)
Türkiye (5)		14 (3.1)	86 (3.1)	0 ~	0 ~
United Arab Emirates		36 (1.7)	62 (1.8)	1 ~	0 ~
United States		58 (2.4)	42 (2.4)	0 ~	0 ~
Uzbekistan		6 (2.1)	75 (4.0)	16 (3.2)	3 (1.3)
International Average		34 (0.4)	58 (0.4)	6 (0.2)	3 (0.2)
Benchmarking Participants					
Ontario, Canada		18 (2.1)	81 (2.1)	0 ~	0 ~
Quebec, Canada		9 (2.3)	91 (2.2)	0 ~	0 ~
Abu Dhabi, UAE		39 (2.4)	59 (2.3)	1 ~	1 ~
Dubai, UAE		40 (4.1)	59 (4.1)	0 ~	0 ~
Sharjah, UAE		33 (4.0)	63 (4.3)	3 (1.7)	0 ~

* Based on countries' categorizations according to UNESCO's International Standard Classification of Education (Operational Manual for ISCED 2011)

** For example, doctorate, master's, or other postgraduate degree.

() Standard errors appear in parentheses. Because of rounding some results may appear inconsistent.

An "r" indicates data are available for at least 70% but less than 85% of the students.

An "s" indicates data are available for at least 50% but less than 70% of the students.

A tilde (~) indicates insufficient data to report result.

SOURCE: IEA's Trends in International Mathematics and Science Study - TIMSS 2023
Downloaded from <https://timss2023.org/results>

Exhibit 5.1.4: Teachers' Formal Education – Teachers' Reports

Country	Percent of Students by Teacher Education Level*			
	Completed Postgraduate University Degree**	Completed Bachelor's Degree or Equivalent but Not a Postgraduate Degree	Completed Post-Secondary Education but Not a Bachelor's Degree	No Further than Upper-Secondary Education
Australia	34 (3.8)	66 (3.8)	0 ~	0 ~
Austria	46 (2.9)	34 (3.2)	19 (2.8)	0 ~
Azerbaijan	26 (2.8)	73 (2.8)	0 ~	1 ~
Bahrain	18 (2.9)	81 (2.9)	1 ~	0 ~
Brazil	17 (2.5)	83 (2.5)	0 ~	0 ~
Chile	20 (3.7)	80 (3.7)	0 ~	0 ~
Chinese Taipei	67 (3.6)	33 (3.6)	0 ~	0 ~
Cote d'Ivoire	33 (4.0)	44 (4.1)	18 (3.0)	4 (1.7)
Cyprus	68 (3.0)	32 (2.9)	1 ~	0 ~
Czech Republic	96 (1.1)	3 (1.0)	0 ~	1 ~
England	77 (3.9)	18 (3.7)	0 ~	5 (2.2)
Finland	93 (1.5)	3 (1.0)	0 ~	4 (1.1)
France	68 (3.9)	32 (3.9)	0 ~	0 ~
Georgia	89 (2.2)	10 (2.1)	1 ~	0 ~
Hong Kong SAR	40 (4.7)	59 (4.9)	1 ~	0 ~
Hungary	49 (3.8)	50 (3.9)	0 ~	0 ~
Iran, Islamic Rep. of	34 (3.4)	61 (3.3)	4 (1.2)	1 ~
Ireland	56 (3.1)	43 (3.1)	1 ~	0 ~
Israel	55 (2.7)	41 (2.6)	3 (1.1)	1 ~
Italy	97 (1.2)	1 ~	0 ~	2 ~
Japan	16 (3.3)	84 (3.3)	0 ~	0 ~
Jordan	13 (2.7)	81 (3.2)	2 ~	4 (1.5)
Kazakhstan	11 (2.0)	84 (2.4)	3 (1.4)	1 ~
Korea, Rep. of	41 (4.3)	59 (4.3)	0 ~	0 ~
Kuwait	10 (2.3)	89 (2.2)	0 ~	0 ~
Lithuania	51 (3.6)	45 (3.6)	3 (1.7)	1 ~
Malaysia	11 (2.1)	88 (2.2)	1 ~	0 ~
Malta	24 (0.1)	70 (0.1)	3 (0.1)	3 (0.1)
Morocco	21 (3.1)	62 (3.7)	10 (2.0)	7 (1.9)
Norway (9)	54 (3.4)	46 (3.4)	0 ~	0 ~
Oman	8 (1.3)	89 (1.6)	1 ~	1 ~
Palestinian Nat'l Auth.	19 (2.9)	75 (3.3)	4 (1.2)	3 (1.1)
Portugal	23 (3.0)	76 (3.0)	1 ~	0 ~
Qatar	30 (3.4)	68 (3.1)	0 ~	2 ~
Romania	45 (5.4)	52 (5.4)	3 (1.6)	0 ~
Saudi Arabia	5 (1.5)	95 (1.6)	0 ~	0 ~
Singapore	21 (3.2)	79 (3.3)	1 ~	0 ~
South Africa (9)	18 (4.1)	49 (4.3)	22 (3.7)	11 (2.7)
Sweden	45 (4.2)	51 (4.1)	2 ~	2 ~
Türkiye	12 (2.7)	88 (2.7)	0 ~	0 ~
United Arab Emirates	37 (1.4)	61 (1.4)	1 ~	1 ~
United States	54 (3.5)	46 (3.5)	0 ~	0 ~
Uzbekistan	18 (3.1)	79 (3.2)	2 ~	2 ~
International Average	39 (0.5)	57 (0.5)	3 (0.2)	1 (0.1)
Benchmarking Participants				
Abu Dhabi, UAE	36 (2.7)	62 (2.7)	1 ~	1 ~
Dubai, UAE	47 (2.4)	53 (2.4)	0 ~	0 ~
Sharjah, UAE	32 (3.2)	65 (3.4)	1 ~	2 ~

* Based on countries' categorizations according to UNESCO's International Standard Classification of Education (Operational Manual for ISCED 2011)

** For example, doctorate, master's, or other postgraduate degree.

() Standard errors appear in parentheses. Because of rounding some results may appear inconsistent.

An "r" indicates data are available for at least 70% but less than 85% of the students.

An "s" indicates data are available for at least 50% but less than 70% of the students.

A tilde (~) indicates insufficient data to report result.

SOURCE: IEA's Trends in International Mathematics and Science Study - TIMSS 2023
Downloaded from <https://timss2023.org/results>

Exhibit 5.1.5: Teachers' Formal Education – Teachers' Reports

Country		Percent of Students by Teacher Education Level*			
		Completed Postgraduate University Degree**	Completed Bachelor's Degree or Equivalent but Not a Postgraduate Degree	Completed Post-Secondary Education but Not a Bachelor's Degree	No Further than Upper-Secondary Education
Australia	s	38 (4.0)	62 (4.0)	0 ~	0 ~
Austria		49 (2.1)	38 (2.3)	13 (1.8)	0 ~
Azerbaijan		22 (1.9)	75 (1.7)	0 ~	3 (0.6)
Bahrain		22 (3.2)	74 (3.3)	3 (1.4)	0 ~
Brazil		18 (1.7)	81 (1.8)	0 ~	1 ~
Chile		22 (3.8)	77 (3.8)	0 ~	1 ~
Chinese Taipei		61 (3.7)	39 (3.7)	0 ~	0 ~
Cyprus		70 (1.7)	29 (1.7)	1 ~	0 ~
Czech Republic		94 (0.9)	4 (0.8)	0 ~	2 ~
England	s	92 (2.4)	6 (2.3)	0 ~	2 ~
Finland		94 (0.9)	3 (0.6)	0 ~	2 ~
France		83 (2.5)	15 (2.4)	1 ~	0 ~
Georgia		88 (1.4)	12 (1.3)	0 ~	0 ~
Hong Kong SAR	s	41 (5.2)	56 (5.2)	2 ~	1 ~
Hungary		54 (2.5)	45 (2.4)	0 ~	0 ~
Iran, Islamic Rep. of		36 (3.3)	58 (3.6)	6 (1.6)	1 ~
Ireland		47 (3.1)	52 (3.2)	0 ~	0 ~
Israel		64 (3.9)	34 (3.9)	2 ~	0 ~
Italy		98 (1.1)	0 ~	0 ~	2 ~
Japan		18 (3.1)	82 (3.1)	0 ~	0 ~
Jordan		13 (2.5)	83 (2.9)	0 ~	5 (1.5)
Kazakhstan		14 (1.3)	84 (1.4)	1 ~	1 ~
Korea, Rep. of		34 (3.4)	66 (3.4)	0 ~	0 ~
Kuwait		13 (2.9)	85 (3.2)	2 ~	0 ~
Lithuania		58 (2.5)	41 (2.4)	1 ~	0 ~
Malaysia		13 (2.1)	86 (2.2)	1 ~	0 ~
Malta		30 (0.5)	68 (0.5)	1 ~	0 ~
Morocco		23 (2.0)	64 (2.5)	10 (1.6)	3 (0.9)
Norway (9)	r	53 (3.8)	47 (3.7)	0 ~	1 ~
Oman		14 (1.9)	85 (2.0)	0 ~	1 ~
Palestinian Nat'l Auth.		14 (2.7)	81 (2.8)	3 (1.3)	2 ~
Portugal		28 (2.3)	71 (2.3)	1 ~	0 ~
Qatar		37 (3.8)	63 (3.8)	0 ~	0 ~
Romania	r	37 (3.7)	60 (3.6)	2 ~	0 ~
Saudi Arabia		8 (2.0)	85 (2.6)	1 ~	7 (1.9)
Singapore		25 (2.8)	75 (2.8)	0 ~	0 ~
South Africa (9)	s	22 (4.5)	55 (4.4)	17 (3.2)	7 (1.8)
Sweden	r	49 (3.5)	44 (3.1)	3 (1.3)	4 (1.3)
Türkiye		14 (2.8)	86 (2.9)	0 ~	0 ~
United Arab Emirates		46 (1.7)	52 (1.7)	1 ~	1 ~
United States		62 (3.5)	37 (3.5)	2 ~	0 ~
Uzbekistan		16 (1.5)	82 (1.6)	1 ~	2 ~
International Average		41 (0.4)	56 (0.4)	2 (0.1)	1 (0.1)
Cote d'Ivoire	x	36 (3.9)	50 (4.4)	14 (3.1)	1 ~
Benchmarking Participants					
Abu Dhabi, UAE		48 (3.1)	50 (3.1)	1 ~	1 ~
Dubai, UAE		55 (3.3)	44 (3.3)	0 ~	1 ~
Sharjah, UAE		41 (3.1)	57 (3.0)	1 ~	1 ~

* Based on countries' categorizations according to UNESCO's International Standard Classification of Education (Operational Manual for ISCED 2011)

** For example, doctorate, master's, or other postgraduate degree.

() Standard errors appear in parentheses. Because of rounding some results may appear inconsistent.

An "r" indicates data are available for at least 70% but less than 85% of the students.

An "s" indicates data are available for at least 50% but less than 70% of the students.

An "x" indicates data are available for at least 40% but less than 50% of the students—interpret with caution.

A tilde (~) indicates insufficient data to report result.

SOURCE: IEA's Trends in International Mathematics and Science Study - TIMSS 2023
Downloaded from <https://timss2023.org/results>

Teachers Majored in Primary Education and Mathematics – Teachers’ Reports

The TIMSS 2023 Teacher Questionnaire collected information about fourth-grade students’ mathematics teachers’ majors during post-secondary education. These are reported in four categories: major in primary education and major or specialization in mathematics, major in primary education by no major or specialization in mathematics, major in mathematics but no major in primary education, and all other majors (Exhibit 5.1.6). The small percentage of students whose mathematics teachers have no formal education beyond upper-secondary is also reported. Details about this index can be found in Supplement 3 of the *TIMSS 2023 User Guide for the International Database*. These percentages must be considered in the context of mathematics teacher preparation within countries. More details can be found in the [TIMSS 2023 Encyclopedia](#).

Internationally, a large majority of fourth-grade students (88%) were taught mathematics by teachers who had a major or specialization in primary education, mathematics, or both (Exhibit 5.1.7). On average, 35 percent of fourth-grade students were taught mathematics by teachers with a major in primary education and a major or specialization in mathematics, 41 percent of students were taught by teachers with a major in primary education but no major or specialization in mathematics, and 12 percent of students were taught by teachers with a major in mathematics but not primary education. Small percentages of students internationally were taught mathematics by teachers with other majors (9%) or teachers with no formal education beyond upper-secondary (3%).

Students with teachers who majored in both primary education and mathematics and who majored in primary education but not mathematics had an average mathematics achievement of 504 internationally. Average mathematics achievement for students with teachers who majored in mathematics but not primary education (498) or had other majors (500). The small percentage of students with mathematics teachers who had no formal education beyond upper-secondary had the lowest average mathematics achievement (464).

Exhibit 5.1.6: Teachers Majored in Primary Education and Mathematics – Teachers' Reports

About the Index

Major in Primary Education and Major (or Specialization) in Mathematics: Teachers majored in primary education and majored or specialized in mathematics

Major in Primary Education but No Major (or Specialization) in Mathematics: Teachers majored in primary education but did not major or specialize in mathematics

Major in Mathematics but No Major in Primary Education: Teachers did not major in primary education but majored or specialized in mathematics

All Other Majors: Teachers did not major in primary education, did not major or specialize in mathematics, but completed post-secondary education (ISCED Level 4) or higher

No Formal Education Beyond Upper-Secondary: Teachers completed no higher than ISCED Level 3

SOURCE: IEA's Trends in International Mathematics and Science Study - TIMSS 2023
Downloaded from <https://timss2023.org/results>

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Exhibit 5.1.7: Teachers Majored in Primary Education and Mathematics – Teachers' Reports

Country		Major in Primary Education and Major (or Specialization) in Mathematics		Major in Primary Education but No Major (or Specialization) in Mathematics		Major in Mathematics but No Major in Primary Education		All Other Majors		No Formal Education Beyond Upper-Secondary	
		Percent of Students	Average Achievement	Percent of Students	Average Achievement	Percent of Students	Average Achievement	Percent of Students	Average Achievement	Percent of Students	Average Achievement
Albania	r	36 (5.9)	516 (6.7)	51 (5.2)	500 (10.4)	0 ~	~	1 ~	~	12 (3.7)	521 (10.0)
Armenia		65 (4.4)	508 (3.5)	13 (3.1)	506 (10.0)	16 (3.3)	528 (9.0)	1 ~	~	5 (2.1)	508 (9.4)
Australia	r	12 (2.9)	533 (8.3)	83 (3.4)	527 (3.5)	1 ~	~	5 (1.7)	528 (17.3)	0 ~	~
Azerbaijan	r	74 (3.4)	498 (4.9)	12 (2.2)	503 (10.5)	8 (2.2)	483 (16.1)	2 ~	~	3 (1.4)	472 (18.5)
Bahrain		55 (3.8)	464 (6.4)	5 (1.8)	483 (22.5)	34 (3.1)	454 (7.4)	5 (1.9)	477 (22.0)	1 ~	~
Belgium (French)	r	22 (2.6)	488 (6.6)	73 (2.9)	495 (3.1)	1 ~	~	2 ~	~	2 ~	~
Bosnia & Herzegovina	r	44 (5.2)	451 (5.6)	52 (5.0)	446 (4.1)	1 ~	~	3 (1.3)	459 (13.9)	0 ~	~
Brazil		45 (3.3)	408 (6.0)	40 (3.2)	391 (5.4)	2 ~	~	8 (2.0)	417 (24.3)	6 (1.4)	391 (12.6)
Bulgaria		17 (2.9)	546 (8.4)	78 (3.3)	528 (4.4)	2 ~	~	3 (1.5)	513 (33.9)	0 ~	~
Canada		13 (1.3)	514 (6.7)	72 (2.1)	503 (2.4)	2 ~	~	12 (1.7)	494 (5.5)	0 ~	~
Chile		71 (3.7)	446 (3.7)	28 (3.8)	438 (6.5)	1 ~	~	0 ~	~	0 ~	~
Chinese Taipei		37 (3.8)	607 (3.1)	43 (4.0)	608 (2.4)	3 (1.3)	596 (6.5)	17 (2.7)	605 (3.8)	0 ~	~
Cyprus		20 (2.8)	521 (5.4)	79 (2.7)	514 (3.1)	1 ~	~	1 ~	~	0 ~	~
Czech Republic		2 ~	~	78 (2.5)	531 (2.4)	3 (1.3)	532 (19.6)	14 (2.2)	530 (6.6)	3 (1.0)	537 (11.5)
Denmark	r	25 (3.3)	517 (4.1)	13 (2.6)	529 (6.9)	48 (3.6)	527 (3.4)	9 (2.0)	526 (5.3)	5 (1.5)	522 (9.3)
England	r	17 (4.0)	558 (10.2)	57 (4.9)	550 (4.7)	3 (1.5)	564 (27.4)	20 (3.9)	551 (10.9)	2 ~	~
Finland		7 (1.7)	546 (7.3)	81 (2.7)	530 (2.7)	1 ~	~	8 (1.6)	522 (10.1)	2 ~	~
France	r	11 (2.4)	479 (7.7)	27 (3.0)	488 (4.6)	16 (2.5)	491 (7.0)	45 (3.6)	482 (4.9)	1 ~	~
Georgia		72 (3.5)	498 (3.7)	3 (1.3)	469 (15.1)	21 (3.1)	503 (7.1)	3 (1.2)	495 (26.4)	1 ~	~
Germany		65 (3.4)	526 (3.1)	25 (3.3)	526 (5.6)	4 (1.3)	509 (10.4)	5 (1.5)	488 (7.9)	2 ~	~
Hong Kong SAR	r	62 (4.0)	599 (5.0)	15 (3.4)	565 (9.4)	10 (2.6)	602 (11.2)	12 (4.4)	605 (28.6)	0 ~	~
Hungary	r	5 (1.8)	543 (18.7)	94 (2.1)	518 (4.5)	0 ~	~	1 ~	~	0 ~	~
Iran, Islamic Rep. of		24 (2.8)	421 (9.1)	28 (2.8)	413 (5.4)	15 (2.8)	433 (13.7)	29 (3.1)	421 (8.2)	5 (1.5)	398 (29.7)
Ireland		7 (1.8)	546 (7.6)	90 (2.5)	545 (3.3)	0 ~	~	4 (1.6)	560 (7.4)	0 ~	~
Italy		9 (1.9)	519 (12.1)	9 (1.9)	514 (7.0)	4 (1.4)	508 (12.5)	24 (2.9)	513 (4.9)	54 (3.1)	512 (3.9)
Japan		14 (2.8)	589 (7.2)	73 (3.4)	588 (2.7)	1 ~	~	12 (2.4)	604 (6.2)	0 ~	~
Jordan		18 (3.4)	426 (15.8)	0 ~	~	68 (4.1)	428 (5.8)	9 (2.4)	428 (14.3)	5 (2.0)	421 (36.8)
Kazakhstan		77 (2.8)	484 (3.9)	19 (2.6)	497 (10.8)	1 ~	~	0 ~	~	4 (1.1)	472 (15.5)
Korea, Rep. of		13 (2.7)	610 (4.0)	85 (2.7)	592 (3.0)	1 ~	~	2 ~	~	0 ~	~
Kosovo	r	42 (2.3)	457 (5.4)	48 (4.4)	459 (4.4)	5 (1.4)	455 (10.4)	5 (2.0)	430 (51.5)	1 ~	~
Kuwait		46 (4.1)	374 (6.4)	3 (1.1)	445 (34.6)	48 (3.8)	379 (8.4)	2 ~	~	1 ~	~
Latvia		44 (3.9)	533 (4.3)	42 (4.0)	539 (3.7)	7 (2.3)	531 (18.1)	4 (1.5)	516 (13.3)	3 (1.3)	541 (8.1)
Lithuania		15 (2.7)	564 (6.9)	82 (2.9)	560 (3.5)	0 ~	~	3 (1.1)	558 (14.7)	1 ~	~
Macao SAR		43 (0.1)	594 (1.4)	32 (0.1)	571 (1.8)	4 (0.1)	608 (3.8)	21 (0.1)	572 (2.3)	0 ~	~
Montenegro		48 (2.9)	479 (3.2)	38 (3.0)	475 (3.7)	6 (1.4)	471 (7.8)	7 (1.4)	479 (7.3)	0 ~	~
Morocco	s	4 (1.7)	374 (14.6)	10 (2.7)	399 (9.5)	14 (3.0)	403 (14.7)	43 (4.6)	385 (9.8)	29 (4.2)	394 (11.2)
New Zealand	s	10 (2.3)	501 (7.7)	80 (3.4)	496 (4.4)	1 ~	~	9 (2.5)	488 (11.5)	0 ~	~
North Macedonia	s	34 (4.4)	470 (9.2)	45 (4.2)	482 (6.1)	7 (1.6)	470 (11.5)	13 (2.7)	462 (11.6)	2 ~	~
Norway (5)	r	62 (4.0)	533 (2.7)	28 (3.7)	528 (4.1)	5 (1.4)	534 (9.2)	5 (1.7)	523 (12.5)	0 ~	~
Oman		47 (3.7)	420 (6.1)	7 (1.8)	433 (21.8)	27 (3.0)	436 (8.5)	19 (2.6)	402 (8.0)	1 ~	~
Poland		10 (2.0)	527 (6.3)	0 ~	~	89 (2.1)	548 (2.1)	0 ~	~	0 ~	~
Portugal		43 (3.3)	519 (5.5)	56 (3.3)	516 (3.5)	0 ~	~	0 ~	~	0 ~	~
Qatar		34 (3.8)	461 (5.5)	18 (2.4)	506 (9.2)	38 (3.6)	446 (6.6)	9 (2.0)	458 (15.0)	1 ~	~
Romania	r	41 (4.4)	549 (8.7)	36 (4.0)	548 (5.9)	4 (1.8)	518 (28.3)	12 (3.1)	547 (14.4)	7 (2.7)	512 (23.1)
Saudi Arabia		43 (3.8)	422 (7.5)	8 (2.1)	413 (14.1)	44 (3.8)	423 (5.9)	4 (1.4)	408 (28.7)	2 ~	~
Serbia		37 (3.5)	529 (6.3)	63 (3.5)	520 (3.7)	0 ~	~	0 ~	~	0 ~	~
Singapore		61 (2.6)	612 (4.0)	8 (1.6)	630 (8.5)	16 (2.2)	623 (7.9)	13 (1.9)	609 (6.0)	1 ~	~
Slovak Republic		25 (2.9)	521 (6.1)	66 (3.3)	511 (4.7)	5 (1.7)	504 (11.6)	4 (1.3)	536 (9.2)	0 ~	~
Slovenia		13 (2.4)	511 (5.5)	86 (2.5)	514 (2.0)	0 ~	~	1 ~	~	0 ~	~
South Africa (5)	r	48 (3.8)	364 (8.0)	13 (2.6)	393 (22.6)	19 (3.0)	351 (10.2)	8 (2.1)	352 (19.0)	12 (2.6)	339 (12.2)
Spain		25 (2.3)	500 (4.3)	66 (2.8)	498 (2.5)	1 ~	~	7 (1.5)	497 (8.8)	0 ~	~
Sweden		80 (3.2)	529 (3.3)	10 (2.4)	530 (10.7)	6 (1.8)	522 (11.4)	4 (1.3)	535 (9.6)	1 ~	~
Türkiye (5)		60 (4.1)	548 (5.8)	0 ~	~	39 (4.2)	564 (6.6)	1 ~	~	0 ~	~
United Arab Emirates		34 (1.7)	492 (4.0)	18 (0.8)	510 (4.6)	39 (1.7)	500 (3.4)	9 (0.8)	508 (7.7)	0 ~	~
United States		12 (1.8)	518 (10.5)	71 (2.7)	518 (3.8)	2 ~	~	15 (2.0)	517 (7.4)	0 ~	~
Uzbekistan		63 (4.1)	446 (4.2)	32 (4.1)	442 (5.0)	2 ~	~	1 ~	~	3 (1.3)	416 (30.9)
International Average		35 (0.4)	504 (1.0)	41 (0.4)	504 (1.3)	12 (0.3)	498 (2.1)	9 (0.3)	500 (2.6)	3 (0.2)	464 (4.8)
Belgium (Flemish)		--	--	--	--	--	--	--	--	--	--
Netherlands		--	--	--	--	--	--	--	--	--	--
Benchmarking Participants											
Ontario, Canada	r	18 (2.4)	520 (9.5)	62 (3.8)	501 (4.8)	2 ~	~	18 (3.4)	496 (7.6)	0 ~	~
Quebec, Canada		5 (1.6)	506 (11.8)	89 (2.4)	515 (3.1)	1 ~	~	5 (1.8)	516 (13.3)	0 ~	~
Abu Dhabi, UAE		38 (2.2)	451 (5.8)	22 (1.8)	469 (7.4)	30 (2.3)	470 (5.5)	9 (1.6)	449 (16.1)	0 ~	~
Dubai, UAE		32 (3.2)	553 (5.9)	24 (1.7)	566 (3.2)	30 (3.1)	560 (5.8)	13 (1.7)	562 (6.2)	0 ~	~
Sharjah, UAE		34 (5.1)	500 (4.4)	9 (1.3)	500 (8.2)	50 (5.0)	508 (6.1)	7 (0.6)	499 (7.0)	0 ~	~

() Standard errors appear in parentheses. Because of rounding some results may appear inconsistent.
 An "r" indicates data are available for at least 70% but less than 85% of the students.
 An "s" indicates data are available for at least 50% but less than 70% of the students.
 A dash (-) indicates comparable data not available. A tilde (~) indicates insufficient data to report result.

SOURCE: IEA's Trends in International Mathematics and Science Study - TIMSS 2023
 Downloaded from <https://timss2023.org/results>

Teachers Majored in Mathematics and Mathematics Education – Teachers’ Reports

The TIMSS 2023 Teacher Questionnaire collected information about eighth-grade students’ mathematics teachers’ majors during post-secondary education. These are reported by four categories: major in mathematics and mathematics education, major in mathematics but no major in mathematics education, major in mathematics education but no major in mathematics, and all other majors. The small percentage of students whose mathematics teachers have no formal education beyond upper-secondary is also reported. Details about this index can be found in Supplement 3 of the *TIMSS 2023 User Guide for the International Database*. These percentages must be considered in the context of mathematics teacher preparation within countries. More details can be found in the [TIMSS 2023 Encyclopedia](#).

Internationally, a large majority of eighth-grade students (90%) had mathematics teachers who majored in mathematics, mathematics education, or both (Exhibit 5.1.9). On average, about three quarters (77%) of students had mathematics teachers who had a major in mathematics and mathematics education (42%), or who had a major in mathematics but not mathematics education (35%). Thirteen percent of students were taught by mathematics teachers who majored in mathematics education and 9 percent of students were taught by mathematics teachers with other majors. A very small percentage of students (1%) had mathematics teachers with no formal education beyond upper-secondary.

Across countries, average mathematics achievement was similar for students who had teachers with different majors. Students with teachers who majored in mathematics and mathematics education and those with teachers who majored in mathematics education only had an average mathematics achievement of 479 and 483, respectively. Students with teachers who majored in mathematics only and students with teachers who had other majors had an average mathematics achievement of 474. The very small percentage of students whose teachers had no formal education beyond upper-secondary had much lower average mathematics achievement (412).

Exhibit 5.1.8: Teachers Majored in Mathematics and Mathematics Education – Teachers' Reports

About the Index
Major in Mathematics and Mathematics Education: Teachers majored in mathematics and majored in mathematics education
Major in Mathematics But No Major in Mathematics Education: Teachers majored in mathematics but did not major in mathematics education
Major in Mathematics Education but No Major in Mathematics: Teachers did not major in mathematics but majored in mathematics education
All Other Majors: Teachers did not major in mathematics, did not major in mathematics education, but completed post-secondary education (ISCED Level 4) or higher
No Formal Education Beyond Upper-Secondary: Teachers completed no higher than ISCED Level 3

SOURCE: IEA's Trends in International Mathematics and Science Study - TIMSS 2023
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Exhibit 5.1.9: Teachers Majored in Mathematics and Mathematics Education – Teachers' Reports

Country	Major in Mathematics and Mathematics Education		Major in Mathematics but No Major in Mathematics Education		Major in Mathematics Education but No Major in Mathematics		All Other Majors		No Formal Education Beyond Upper-Secondary	
	Percent of Students	Average Achievement	Percent of Students	Average Achievement	Percent of Students	Average Achievement	Percent of Students	Average Achievement	Percent of Students	Average Achievement
Australia	r	46 (3.9)	527 (7.0)	15 (2.7)	506 (9.6)	16 (3.3)	522 (8.6)	24 (3.0)	497 (11.3)	0 ~
Austria		19 (2.9)	507 (8.7)	3 (1.2)	477 (21.1)	73 (3.2)	523 (3.1)	5 (1.4)	484 (19.8)	0 ~
Azerbaijan		38 (3.6)	483 (5.7)	59 (3.6)	476 (5.9)	0 ~	~	2 ~	~	1 ~
Bahrain		44 (3.4)	432 (7.0)	42 (3.8)	419 (4.6)	11 (2.2)	435 (16.7)	3 (0.9)	408 (19.0)	0 ~
Brazil		73 (2.8)	382 (3.8)	25 (2.8)	376 (10.6)	0 ~	~	2 ~	~	0 ~
Chile		68 (3.7)	422 (4.2)	22 (3.9)	405 (9.0)	1 ~	~	10 (2.7)	404 (13.2)	0 ~
Chinese Taipei		41 (3.5)	609 (5.1)	39 (3.5)	612 (5.7)	7 (1.8)	583 (9.6)	13 (2.2)	566 (8.7)	0 ~
Cote d'Ivoire		49 (4.3)	257 (3.7)	30 (3.7)	276 (11.0)	5 (1.8)	318 (31.4)	12 (3.0)	249 (6.5)	5 (1.8)
Cyprus		28 (2.6)	499 (5.5)	71 (2.6)	491 (3.7)	0 ~	~	1 ~	~	0 ~
Czech Republic		4 (1.5)	516 (21.7)	14 (2.3)	524 (5.4)	70 (2.7)	519 (3.3)	11 (2.0)	508 (8.7)	1 ~
England	s	45 (5.3)	519 (9.3)	30 (4.9)	520 (13.6)	7 (2.4)	503 (16.1)	13 (3.4)	519 (16.3)	5 (2.2)
Finland		15 (2.1)	514 (5.7)	55 (3.0)	509 (3.4)	1 ~	~	26 (2.5)	493 (5.2)	4 (1.1)
France		41 (3.6)	476 (5.6)	48 (3.6)	487 (4.5)	0 ~	~	11 (2.7)	467 (12.9)	0 ~
Georgia		59 (3.6)	466 (4.1)	34 (3.3)	469 (5.9)	3 (1.4)	435 (12.3)	4 (1.6)	496 (29.8)	0 ~
Hong Kong SAR	r	52 (4.2)	582 (10.2)	13 (2.5)	584 (13.9)	13 (2.8)	583 (17.1)	22 (3.5)	554 (15.4)	0 ~
Hungary		10 (1.8)	514 (9.8)	9 (1.7)	469 (15.8)	74 (2.9)	513 (4.5)	6 (1.5)	467 (21.4)	0 ~
Iran, Islamic Rep. of		42 (3.2)	425 (5.1)	37 (2.9)	433 (5.9)	8 (1.8)	417 (12.8)	12 (2.3)	391 (13.3)	1 ~
Ireland		51 (3.2)	524 (4.3)	29 (2.6)	526 (6.1)	9 (1.8)	524 (7.1)	11 (1.7)	518 (8.4)	0 ~
Israel		59 (2.7)	485 (6.7)	26 (2.4)	488 (9.3)	9 (1.7)	509 (15.6)	5 (1.1)	479 (13.9)	1 ~
Italy		31 (3.5)	502 (5.7)	15 (2.3)	493 (6.7)	7 (1.7)	506 (6.8)	45 (4.0)	502 (4.9)	2 ~
Japan		49 (4.0)	592 (3.3)	32 (3.8)	596 (5.5)	9 (2.1)	586 (5.8)	10 (2.8)	612 (18.1)	0 ~
Jordan		30 (3.9)	394 (7.5)	62 (4.2)	386 (4.8)	2 ~	~	2 ~	~	4 (1.5)
Kazakhstan		62 (3.4)	455 (4.7)	35 (3.5)	452 (6.8)	1 ~	~	1 ~	~	1 ~
Korea, Rep. of		19 (3.2)	589 (8.6)	37 (3.9)	600 (4.9)	43 (4.1)	597 (4.3)	1 ~	~	0 ~
Kuwait		25 (3.6)	427 (15.8)	49 (4.4)	386 (6.9)	22 (3.5)	386 (7.8)	3 (1.6)	444 (32.3)	0 ~
Lithuania		51 (3.9)	522 (4.7)	39 (3.4)	504 (5.7)	7 (1.7)	510 (11.2)	4 (1.5)	523 (26.2)	1 ~
Malaysia		30 (3.0)	421 (6.6)	29 (2.8)	412 (6.8)	17 (2.2)	406 (9.2)	24 (2.9)	400 (6.9)	0 ~
Malta		62 (0.1)	500 (1.5)	27 (0.1)	502 (2.5)	4 (0.1)	515 (6.3)	3 (0.1)	530 (8.5)	3 (0.1)
Morocco		14 (2.3)	371 (6.9)	60 (3.4)	381 (4.4)	2 ~	~	18 (2.6)	373 (6.9)	7 (1.9)
Norway (9)	r	27 (3.5)	504 (4.5)	60 (3.9)	503 (3.0)	2 ~	~	10 (2.3)	498 (7.2)	0 ~
Oman		46 (3.3)	417 (5.0)	39 (3.1)	406 (4.3)	14 (2.1)	407 (7.7)	0 ~	~	1 ~
Palestinian Nat'l Auth.		32 (3.0)	389 (6.1)	40 (3.2)	378 (4.4)	22 (2.8)	384 (5.4)	4 (1.4)	387 (20.0)	3 (1.1)
Portugal		80 (3.0)	477 (3.0)	18 (2.8)	476 (9.3)	1 ~	~	1 ~	~	0 ~
Qatar		48 (5.2)	457 (7.9)	39 (5.1)	453 (8.6)	9 (2.7)	403 (14.3)	2 ~	~	2 ~
Romania	r	56 (5.1)	504 (8.3)	42 (5.1)	497 (7.6)	0 ~	~	1 ~	~	0 ~
Saudi Arabia		23 (2.8)	406 (8.5)	63 (3.4)	394 (4.7)	11 (2.1)	390 (9.2)	3 (1.2)	415 (27.8)	0 ~
Singapore		57 (3.6)	602 (8.2)	30 (3.3)	611 (9.7)	3 (1.1)	590 (17.1)	10 (2.1)	613 (16.2)	0 ~
Sweden		56 (4.3)	518 (3.6)	16 (2.8)	511 (6.4)	21 (3.5)	521 (6.0)	4 (1.5)	505 (11.6)	2 ~
Türkiye		54 (3.4)	501 (6.3)	22 (3.2)	539 (12.5)	23 (3.4)	500 (10.8)	1 ~	~	0 ~
United Arab Emirates		48 (1.4)	504 (3.1)	41 (1.5)	468 (3.7)	5 (0.7)	476 (9.9)	5 (0.7)	452 (10.8)	1 ~
United States		33 (2.5)	497 (6.3)	13 (1.9)	499 (12.7)	20 (2.8)	491 (9.9)	34 (3.5)	479 (8.3)	0 ~
Uzbekistan		44 (4.2)	423 (7.6)	49 (4.2)	419 (5.1)	4 (1.5)	429 (13.5)	2 ~	~	2 ~
International Average		42 (0.5)	479 (1.1)	35 (0.5)	474 (1.3)	13 (0.3)	483 (2.2)	9 (0.3)	474 (2.9)	1 (0.1)
South Africa (9)	y	- -	- -	- -	- -	- -	- -	- -	- -	- -
Benchmarking Participants										
Abu Dhabi, UAE		45 (2.4)	459 (4.2)	40 (2.7)	443 (5.8)	5 (1.4)	451 (14.1)	9 (1.7)	429 (13.6)	1 ~
Dubai, UAE		62 (3.1)	557 (4.4)	30 (3.0)	531 (10.5)	3 (1.2)	548 (20.7)	3 (1.0)	533 (14.4)	0 ~
Sharjah, UAE		43 (3.5)	509 (6.2)	49 (4.0)	482 (6.5)	4 (1.6)	453 (20.3)	2 ~	~	2 ~

() Standard errors appear in parentheses. Because of rounding some results may appear inconsistent.
 An "r" indicates data are available for at least 70% but less than 85% of the students.
 An "s" indicates data are available for at least 50% but less than 70% of the students.
 A "y" indicates data are available for less than 40% of the students.
 A dash (-) indicates comparable data not available. A tilde (~) indicates insufficient data to report result.

SOURCE: IEA's Trends in International Mathematics and Science Study - TIMSS 2023
 Downloaded from <https://timss2023.org/results>

Teachers Majored in Primary Education and Science – Teachers’ Reports

The TIMSS 2023 Teacher Questionnaire collected information about fourth-grade students’ science teachers’ majors during post-secondary education. These are reported in four categories: major in primary education and major or specialization in science, major in primary education but no major or specialization in science, major in science but no major in primary education, and all other majors (Exhibit 5.1.10). The small percentage of students whose science teachers have no formal education beyond upper-secondary is also reported. Details about this index can be found in Supplement 3 of the *TIMSS 2023 User Guide for the International Database*. These percentages must be considered in the context of science teacher preparation within countries. More details can be found in the [TIMSS 2023 Encyclopedia](#).

Across countries, a large majority of fourth-grade students (88%) had science teachers with a major in primary education, science, or both (Exhibit 5.1.11). On average, 31 percent of students had science teachers with a major in primary education and a major or specialization in science, 42 percent had teachers with a major in primary education but no major or specialization in science, 15 percent had teachers with a major in science only, and 9 percent had teachers with other majors. A small percentage of students (3%) had teachers who had no formal education beyond upper-secondary.

Average achievement differences across fourth-grade students who had science teachers with different majors are very small. Students with teachers who majored in primary education and had a major or specialization in science, as well as those whose teachers majored in primary education only, had an average international achievement of 495 and 496, respectively. Students whose teachers majored in science only had an average science achievement of 491, and students whose teachers had other majors had an average science achievement of 493. Students whose teachers had no formal education beyond upper-secondary had much lower average science achievement (450).

Exhibit 5.1.10: Teachers Majored in Primary Education and Science – Teachers’ Reports

About the Index
Major in Primary Education and Major (or Specialization) in Science: Teachers majored in primary education and majored or specialized in science
Major in Primary Education but No Major (or Specialization) in Science: Teachers majored in primary education but did not major or specialize in science
Major in Science but No Major in Primary Education: Teachers did not major in primary education but majored or specialized in science
All Other Majors: Teachers did not major in primary education, did not major or specialize in science, but completed post-secondary education (ISCED Level 4) or higher
No Formal Education Beyond Upper-Secondary: Teachers completed no higher than ISCED Level 3

SOURCE: IEA's Trends in International Mathematics and Science Study - TIMSS 2023
 Downloaded from <https://timss2023.org/results>

Exhibit 5.1.11: Teachers Majored in Primary Education and Science – Teachers' Reports

Country		Major in Primary Education and Major (or Specialization) in Science		Major in Primary Education but No Major (or Specialization) in Science		Major in Science but No Major in Primary Education		All Other Majors		No Formal Education Beyond Upper-Secondary	
		Percent of Students	Average Achievement	Percent of Students	Average Achievement	Percent of Students	Average Achievement	Percent of Students	Average Achievement	Percent of Students	Average Achievement
Albania	r	36 (5.8)	487 (6.6)	50 (5.0)	482 (8.9)	0 ~	~	1 ~	~	13 (4.3)	497 (9.8)
Armenia		41 (4.2)	459 (3.8)	34 (4.3)	446 (5.4)	18 (3.6)	465 (6.3)	3 (1.5)	446 (13.8)	3 (1.4)	479 (5.3)
Australia	s	9 (2.1)	537 (9.2)	83 (2.8)	553 (3.1)	3 (1.4)	577 (14.6)	6 (1.8)	550 (14.1)	0 ~	~
Azerbaijan	r	65 (3.6)	429 (4.5)	18 (2.9)	404 (8.5)	8 (2.2)	409 (13.3)	6 (1.7)	420 (12.9)	3 (1.3)	425 (14.9)
Bahrain		35 (4.1)	471 (8.0)	4 (1.5)	533 (19.6)	57 (4.1)	471 (5.3)	4 (1.2)	497 (27.2)	0 ~	~
Belgium (French)	r	21 (3.0)	477 (8.0)	74 (3.1)	486 (3.5)	2 ~	~	2 ~	~	1 ~	~
Bosnia & Herzegovina	r	45 (5.4)	451 (6.1)	51 (5.0)	447 (4.0)	2 ~	~	2 ~	~	0 ~	~
Brazil		38 (3.2)	430 (5.3)	45 (3.1)	420 (7.0)	2 ~	~	9 (2.0)	437 (22.8)	5 (1.5)	422 (13.0)
Bulgaria		16 (3.0)	553 (9.9)	75 (3.5)	529 (4.8)	6 (2.2)	579 (50.1)	4 (1.7)	510 (35.3)	0 ~	~
Canada		12 (1.4)	524 (6.5)	72 (2.1)	519 (2.4)	4 (1.2)	529 (9.5)	11 (1.4)	521 (5.8)	1 ~	~
Chile		58 (3.7)	486 (3.8)	38 (4.0)	475 (4.6)	2 ~	~	3 (1.6)	474 (9.7)	0 ~	~
Chinese Taipei		35 (3.6)	578 (2.7)	31 (3.5)	572 (2.9)	15 (2.5)	575 (4.6)	18 (2.6)	562 (4.5)	0 ~	~
Cyprus		27 (3.3)	490 (6.0)	71 (3.4)	483 (3.9)	2 ~	~	0 ~	~	0 ~	~
Czech Republic		3 (1.0)	532 (5.1)	67 (2.7)	526 (2.5)	10 (2.4)	533 (10.9)	16 (2.3)	519 (5.0)	4 (1.8)	537 (18.8)
Denmark	r	21 (3.4)	518 (5.9)	21 (3.1)	520 (5.6)	20 (3.6)	520 (6.9)	30 (3.6)	522 (4.7)	8 (2.5)	525 (7.9)
England	r	18 (4.0)	567 (9.8)	58 (4.9)	554 (4.0)	6 (2.5)	568 (28.0)	15 (3.6)	554 (9.4)	3 (1.8)	548 (12.6)
Finland		5 (1.4)	547 (11.5)	84 (2.4)	543 (3.1)	1 ~	~	8 (1.6)	546 (8.1)	2 ~	~
France	r	12 (2.7)	487 (7.9)	25 (3.5)	495 (4.8)	23 (3.3)	498 (5.2)	38 (3.9)	480 (5.8)	1 ~	~
Georgia		57 (3.6)	466 (4.6)	9 (2.0)	452 (6.8)	31 (3.2)	468 (6.3)	2 ~	~	1 ~	~
Germany	r	58 (3.5)	518 (3.5)	30 (3.3)	521 (5.7)	4 (1.2)	477 (27.4)	8 (2.1)	495 (11.4)	1 ~	~
Hong Kong SAR	s	42 (4.7)	536 (9.4)	44 (4.7)	549 (6.8)	4 (1.7)	557 (19.9)	10 (2.9)	525 (10.4)	0 ~	~
Hungary	r	11 (2.6)	511 (10.8)	86 (3.0)	525 (4.1)	2 ~	~	2 ~	~	0 ~	~
Iran, Islamic Rep. of		24 (2.6)	422 (9.8)	27 (2.6)	436 (5.5)	12 (2.6)	445 (15.3)	31 (3.1)	435 (9.5)	5 (1.5)	404 (32.6)
Ireland		6 (2.0)	536 (6.3)	89 (2.6)	531 (3.5)	1 ~	~	3 (1.6)	540 (9.1)	0 ~	~
Italy		7 (1.7)	515 (11.2)	11 (2.1)	512 (6.1)	3 (1.1)	518 (9.5)	26 (3.1)	512 (4.4)	54 (3.1)	509 (3.6)
Japan		24 (3.8)	555 (4.0)	60 (4.2)	553 (3.1)	4 (1.8)	549 (6.7)	11 (2.8)	567 (6.3)	0 ~	~
Jordan		15 (3.2)	410 (10.1)	2 ~	~	72 (4.1)	420 (6.9)	8 (2.2)	426 (13.6)	3 (1.5)	392 (24.1)
Kazakhstan		65 (3.3)	456 (4.2)	30 (3.1)	493 (8.6)	1 ~	~	0 ~	~	4 (1.0)	406 (17.7)
Korea, Rep. of		18 (2.9)	587 (5.4)	79 (3.2)	582 (3.0)	2 ~	~	1 ~	~	0 ~	~
Kosovo	r	38 (4.1)	404 (6.0)	52 (4.5)	413 (4.1)	5 (1.6)	400 (7.6)	4 (2.0)	391 (60.1)	1 ~	~
Kuwait		47 (4.0)	365 (9.8)	8 (2.4)	398 (31.9)	44 (4.0)	369 (9.4)	1 ~	~	0 ~	~
Latvia		43 (4.3)	526 (4.8)	30 (3.5)	537 (3.5)	19 (3.3)	511 (8.7)	5 (1.7)	520 (12.6)	2 ~	~
Lithuania		17 (2.7)	533 (8.2)	78 (3.0)	538 (3.4)	1 ~	~	2 ~	~	1 ~	~
Macao SAR		26 (0.1)	540 (2.3)	41 (0.2)	528 (1.9)	10 (0.2)	552 (2.9)	23 (0.2)	540 (2.0)	0 ~	~
Montenegro		47 (2.6)	462 (3.1)	40 (2.7)	459 (3.9)	6 (1.3)	459 (7.2)	8 (1.5)	462 (8.5)	0 ~	~
Morocco	r	5 (1.6)	396 (25.4)	8 (2.2)	395 (7.9)	41 (3.8)	385 (11.2)	25 (3.9)	379 (11.7)	22 (3.6)	385 (11.7)
New Zealand	s	11 (2.7)	532 (8.3)	79 (3.5)	524 (4.4)	3 (1.1)	505 (14.4)	8 (2.4)	524 (13.2)	0 ~	~
North Macedonia	s	35 (4.9)	435 (10.5)	46 (4.9)	452 (6.9)	3 (1.1)	452 (21.6)	15 (2.8)	424 (12.9)	2 ~	~
Norway (5)	r	43 (4.4)	533 (4.4)	44 (4.0)	535 (3.5)	4 (1.5)	529 (10.9)	8 (2.1)	513 (10.0)	1 ~	~
Oman		48 (3.4)	430 (6.5)	4 (1.3)	463 (21.9)	39 (3.5)	435 (6.3)	8 (2.0)	427 (12.3)	0 ~	~
Poland		17 (2.7)	549 (7.4)	0 ~	~	82 (2.6)	549 (2.1)	1 ~	~	0 ~	~
Portugal		36 (3.1)	511 (4.7)	61 (3.2)	509 (2.8)	2 ~	~	0 ~	~	0 ~	~
Qatar		30 (3.6)	477 (6.6)	17 (2.4)	514 (9.2)	48 (3.6)	449 (6.3)	4 (1.3)	503 (13.4)	0 ~	~
Romania	r	40 (4.4)	532 (8.6)	36 (4.0)	531 (5.9)	4 (1.8)	509 (29.1)	14 (3.3)	543 (12.5)	6 (2.6)	489 (19.3)
Saudi Arabia		34 (3.7)	417 (8.2)	9 (2.2)	412 (14.4)	35 (3.5)	442 (6.6)	21 (3.1)	421 (9.6)	2 ~	~
Serbia		36 (3.5)	515 (6.0)	63 (3.5)	507 (3.5)	0 ~	~	0 ~	~	0 ~	~
Singapore		54 (2.9)	609 (4.1)	7 (1.4)	607 (10.8)	29 (2.7)	604 (4.7)	10 (1.6)	611 (7.6)	0 ~	~
Slovak Republic		21 (2.6)	519 (8.5)	67 (3.4)	521 (4.9)	4 (1.4)	518 (22.5)	6 (1.9)	526 (14.8)	1 ~	~
Slovenia		11 (2.0)	526 (7.2)	89 (2.1)	526 (2.4)	1 ~	~	0 ~	~	0 ~	~
South Africa (5)	r	42 (4.0)	322 (13.1)	19 (3.1)	325 (21.6)	13 (2.4)	273 (21.3)	13 (2.6)	291 (21.4)	13 (2.7)	283 (22.1)
Spain		28 (2.5)	501 (3.4)	65 (2.6)	506 (2.5)	0 ~	~	7 (1.4)	499 (7.5)	0 ~	~
Sweden		73 (3.8)	537 (3.2)	13 (3.3)	521 (16.7)	7 (1.9)	538 (10.7)	3 (1.2)	531 (9.4)	3 (1.4)	499 (18.2)
Türkiye (5)		47 (3.4)	568 (5.9)	1 ~	~	48 (3.1)	573 (4.9)	4 (1.6)	560 (10.2)	0 ~	~
United Arab Emirates		33 (1.7)	489 (5.2)	16 (1.1)	496 (8.9)	46 (1.4)	500 (3.4)	5 (0.6)	497 (15.1)	0 ~	~
United States		10 (1.6)	534 (8.2)	73 (2.6)	535 (3.5)	4 (1.0)	517 (13.4)	13 (1.8)	530 (7.3)	0 ~	~
Uzbekistan		65 (4.4)	416 (4.4)	26 (3.9)	403 (5.9)	6 (2.0)	411 (7.8)	1 ~	~	3 (1.4)	399 (26.7)
International Average		31 (0.4)	495 (1.1)	42 (0.4)	496 (1.2)	15 (0.3)	491 (2.4)	9 (0.3)	493 (2.5)	3 (0.2)	450 (4.5)
Belgium (Flemish)		--	--	--	--	--	--	--	--	--	--
Netherlands		--	--	--	--	--	--	--	--	--	--
Benchmarking Participants											
Ontario, Canada	r	17 (2.7)	528 (8.6)	62 (3.9)	527 (4.3)	7 (2.5)	520 (11.2)	14 (2.5)	522 (8.8)	0 ~	~
Quebec, Canada		6 (1.8)	489 (12.5)	87 (2.6)	508 (3.1)	1 ~	~	6 (2.0)	512 (9.6)	0 ~	~
Abu Dhabi, UAE		34 (3.2)	438 (9.6)	20 (2.6)	447 (14.0)	42 (2.3)	456 (6.0)	4 (1.1)	420 (24.9)	1 ~	~
Dubai, UAE		31 (2.7)	556 (4.7)	24 (1.8)	564 (4.7)	38 (2.7)	571 (4.3)	7 (1.2)	572 (8.1)	0 ~	~
Sharjah, UAE		29 (3.2)	506 (9.2)	6 (1.5)	442 (21.6)	62 (2.9)	510 (5.8)	4 (1.3)	512 (8.8)	0 ~	~

() Standard errors appear in parentheses. Because of rounding some results may appear inconsistent.
 An "r" indicates data are available for at least 70% but less than 85% of the students.
 An "s" indicates data are available for at least 50% but less than 70% of the students.
 A dash (-) indicates comparable data not available. A tilde (~) indicates insufficient data to report result.

SOURCE: IEA's Trends in International Mathematics and Science Study - TIMSS 2023
 Downloaded from <https://timss2023.org/results>

Teachers Majored in Science and Science Education – Teachers’ Reports

The TIMSS 2023 Teacher Questionnaire collected information about eighth-grade students’ science teachers’ majors during post-secondary education. These are reported by four categories: major in science and science education, major in science but no major in science education, major in science education but no major in science, and all other majors (Exhibit 5.1.12). The small percentage of students whose science teachers have no formal education beyond upper-secondary is also reported. Details about this index can be found in Supplement 3 of the *TIMSS 2023 User Guide for the International Database*. These percentages must be considered in the context of science teacher preparation within countries. More details can be found in the [TIMSS 2023 Encyclopedia](#).

Across countries, the majority of eighth-grade students (92%) had science teachers with a major in science education, science, or both (Exhibit 5.1.13). Internationally, almost half of eighth-grade students (47%) had science teachers who majored in science but not science education. A further 34 percent of students had teachers who majored in both science education and science, and 11 percent of students had teachers who majored only in science education. Six percent of students had science teachers with other majors and only 1 percent of students had science teachers who completed no formal education beyond upper-secondary.

The average science achievement differences for students with teachers having different majors are small. Students whose teachers majored in science and science education and students whose teachers majored in science education only had very similar average science achievement (487 vs. 482). Students whose teachers majored in science but not science education had an average science achievement of 478 and students whose science teachers had other majors had an average science achievement of 472. The very small percentage of students whose science teachers did not complete formal education beyond upper-secondary had the lowest average science achievement (407).

About the Index
Major in Science and Science Education: Teachers majored in science and majored in science education
Major in Science No Major in Science Education: Teachers majored in science but did not major in science education
Major in Science Education but No Major in Science: Teachers did not major in science but majored in science education
All Other Majors: Teachers did not major in science, did not major in science education, but completed post-secondary education (ISCED Level 4) or higher
No Formal Education Beyond Upper-Secondary: Teachers completed no higher than ISCED Level 3

SOURCE: IEA's Trends in International Science and Science Study - TIMSS 2023
Downloaded from <https://timss2023.org/results>

Exhibit 5.1.13: Teachers Majored in Science and Science Education – Teachers' Reports

Country		Major in Science and Science Education		Major in Science but No Major in Science Education		Major in Science Education but No Major in Science		All Other Majors		No Formal Education Beyond Upper-Secondary	
		Percent of Students	Average Achievement	Percent of Students	Average Achievement	Percent of Students	Average Achievement	Percent of Students	Average Achievement	Percent of Students	Average Achievement
Australia	s	68 (3.2)	526 (4.5)	21 (2.6)	527 (6.0)	6 (1.3)	518 (10.4)	6 (1.6)	519 (12.1)	0 ~	~ ~
Austria		16 (1.6)	517 (4.5)	7 (1.2)	511 (8.2)	62 (1.9)	520 (3.4)	15 (1.4)	480 (6.7)	0 ~	~ ~
Azerbaijan	r	29 (1.6)	413 (4.0)	61 (1.7)	411 (3.3)	0 ~	~ ~	7 (1.1)	408 (12.0)	3 (0.7)	401 (8.9)
Bahrain		36 (3.5)	464 (6.2)	59 (3.5)	446 (4.3)	4 (1.0)	430 (22.6)	0 ~	~ ~	0 ~	~ ~
Brazil		76 (2.5)	424 (4.2)	19 (2.4)	417 (8.6)	1 ~	~ ~	4 (0.7)	376 (7.1)	1 ~	~ ~
Chile		53 (4.2)	469 (4.7)	22 (3.5)	441 (5.5)	9 (2.7)	447 (12.6)	15 (3.1)	441 (8.9)	1 ~	~ ~
Chinese Taipei		23 (3.1)	582 (5.9)	71 (3.5)	570 (3.2)	1 ~	~ ~	6 (1.8)	548 (15.3)	0 ~	~ ~
Cyprus		11 (1.6)	488 (10.0)	88 (1.6)	460 (2.8)	0 ~	~ ~	1 ~	~ ~	0 ~	~ ~
Czech Republic		10 (1.1)	531 (4.7)	21 (1.5)	521 (3.1)	53 (2.0)	531 (2.1)	14 (1.3)	519 (4.4)	2 ~	~ ~
England	s	55 (5.2)	525 (8.7)	39 (5.3)	539 (10.0)	5 (2.6)	554 (25.6)	0 ~	~ ~	2 ~	~ ~
Finland		14 (1.4)	533 (5.1)	63 (1.9)	534 (3.7)	0 ~	~ ~	21 (1.3)	521 (5.3)	2 ~	~ ~
France		45 (3.0)	487 (4.3)	50 (2.9)	494 (3.6)	2 ~	~ ~	3 (1.0)	421 (26.6)	0 ~	~ ~
Georgia		36 (1.9)	446 (3.2)	61 (1.9)	450 (3.2)	1 ~	~ ~	2 ~	~ ~	0 ~	~ ~
Hong Kong SAR	s	41 (4.6)	545 (11.9)	43 (4.6)	522 (10.2)	8 (2.3)	534 (12.5)	7 (2.2)	505 (13.5)	1 ~	~ ~
Hungary		18 (1.5)	518 (6.4)	9 (1.2)	522 (5.5)	69 (1.9)	525 (3.4)	4 (1.0)	493 (13.4)	0 ~	~ ~
Iran, Islamic Rep. of		26 (2.9)	439 (5.9)	32 (3.2)	421 (7.0)	29 (3.0)	410 (8.2)	12 (2.2)	387 (10.8)	1 ~	~ ~
Ireland		61 (3.8)	531 (4.1)	34 (3.8)	526 (5.8)	2 ~	~ ~	2 ~	~ ~	0 ~	~ ~
Israel		61 (3.6)	488 (5.1)	29 (3.2)	476 (10.4)	8 (2.0)	465 (13.3)	3 (1.1)	464 (23.2)	0 ~	~ ~
Italy		35 (3.7)	499 (4.4)	58 (3.7)	498 (5.1)	2 ~	~ ~	3 (1.4)	503 (17.3)	2 ~	~ ~
Japan		36 (4.6)	556 (7.7)	51 (4.7)	558 (3.0)	10 (2.2)	558 (4.6)	3 (1.3)	546 (8.0)	0 ~	~ ~
Jordan		18 (3.1)	419 (8.5)	69 (3.7)	411 (4.7)	6 (1.3)	427 (12.5)	2 ~	~ ~	5 (1.6)	421 (22.1)
Kazakhstan		39 (2.2)	449 (4.5)	59 (2.2)	439 (3.3)	0 ~	~ ~	1 ~	~ ~	1 ~	~ ~
Korea, Rep. of		34 (3.7)	546 (3.7)	60 (3.8)	545 (2.8)	6 (1.8)	555 (8.9)	0 ~	~ ~	0 ~	~ ~
Kuwait		11 (2.5)	438 (26.1)	55 (3.9)	425 (7.5)	31 (3.4)	401 (8.9)	3 (1.5)	455 (31.1)	0 ~	~ ~
Lithuania		18 (1.6)	524 (4.9)	77 (1.8)	519 (3.1)	2 ~	~ ~	3 (0.8)	505 (9.6)	0 ~	~ ~
Malaysia		35 (3.2)	424 (6.8)	39 (3.1)	433 (6.6)	10 (2.1)	417 (10.5)	15 (2.3)	421 (10.2)	0 ~	~ ~
Malta		51 (0.6)	507 (2.1)	46 (0.6)	496 (2.3)	0 ~	~ ~	2 ~	~ ~	0 ~	~ ~
Morocco		19 (2.1)	329 (6.1)	78 (2.2)	325 (4.1)	0 ~	~ ~	0 ~	~ ~	3 (0.9)	338 (20.9)
Norway (9)	r	15 (2.7)	500 (7.6)	24 (2.8)	501 (3.5)	21 (3.1)	481 (5.8)	39 (3.4)	488 (3.5)	1 ~	~ ~
Oman		31 (3.2)	466 (5.5)	65 (3.4)	450 (3.6)	2 ~	~ ~	0 ~	~ ~	2 ~	~ ~
Palestinian Nat'l Auth.		14 (2.3)	400 (10.1)	49 (3.7)	394 (4.3)	32 (3.3)	386 (4.4)	3 (1.3)	409 (29.3)	2 ~	~ ~
Portugal		59 (2.5)	506 (3.0)	40 (2.6)	506 (3.4)	0 ~	~ ~	1 ~	~ ~	0 ~	~ ~
Qatar		34 (3.7)	498 (8.4)	53 (4.2)	466 (5.9)	6 (1.5)	500 (17.8)	7 (2.5)	497 (10.2)	0 ~	~ ~
Romania	r	28 (2.6)	473 (4.7)	70 (2.7)	471 (4.3)	1 ~	~ ~	1 ~	~ ~	1 ~	~ ~
Saudi Arabia		17 (2.8)	432 (9.1)	67 (3.3)	417 (4.4)	8 (1.9)	425 (11.7)	2 ~	~ ~	7 (1.9)	415 (11.8)
Singapore		61 (3.1)	606 (7.0)	36 (3.1)	605 (10.6)	1 ~	~ ~	2 ~	~ ~	0 ~	~ ~
South Africa (9)	s	0 ~	~ ~	82 (3.1)	365 (5.1)	0 ~	~ ~	13 (2.7)	380 (17.7)	5 (1.3)	331 (12.9)
Sweden	r	52 (3.6)	523 (4.6)	21 (2.5)	517 (6.1)	15 (2.7)	530 (8.7)	8 (2.1)	516 (12.0)	4 (1.3)	533 (15.3)
Türkiye		37 (3.8)	525 (7.5)	15 (2.9)	553 (9.7)	45 (4.0)	526 (7.3)	2 ~	~ ~	0 ~	~ ~
United Arab Emirates		45 (1.4)	500 (3.9)	46 (1.4)	475 (3.4)	5 (0.6)	432 (12.0)	3 (0.7)	484 (15.2)	1 ~	~ ~
United States		31 (2.7)	513 (6.3)	28 (3.3)	516 (9.6)	16 (2.4)	520 (6.2)	25 (2.5)	512 (8.8)	0 ~	~ ~
Uzbekistan		33 (2.3)	396 (6.1)	64 (2.4)	396 (3.5)	1 ~	~ ~	0 ~	~ ~	2 ~	~ ~
International Average		34 (0.5)	487 (1.2)	47 (0.5)	478 (0.9)	11 (0.3)	482 (2.4)	6 (0.2)	472 (3.0)	1 (0.1)	407 (6.5)
Cote d'Ivoire	x	56 (4.4)	181 (8.7)	38 (4.3)	187 (18.3)	3 (1.3)	146 (31.3)	2 ~	~ ~	1 ~	~ ~
Benchmarking Participants											
Abu Dhabi, UAE		48 (2.6)	454 (7.0)	42 (2.4)	434 (7.6)	5 (1.2)	410 (21.2)	4 (1.5)	450 (20.0)	1 ~	~ ~
Dubai, UAE		51 (2.4)	566 (5.7)	43 (2.4)	534 (6.4)	2 ~	~ ~	2 ~	~ ~	1 ~	~ ~
Sharjah, UAE		41 (3.7)	501 (6.7)	51 (3.2)	483 (5.2)	5 (1.8)	479 (34.0)	2 ~	~ ~	1 ~	~ ~

() Standard errors appear in parentheses. Because of rounding some results may appear inconsistent.
 An "r" indicates data are available for at least 70% but less than 85% of the students.
 An "s" indicates data are available for at least 50% but less than 70% of the students.
 An "x" indicates data are available for at least 40% but less than 50% of the students—interpret with caution.
 A tilde (~) indicates insufficient data to report result.

SOURCE: IEA's Trends in International Mathematics and Science Study - TIMSS 2023
 Downloaded from <https://timss2023.org/results>

Mathematics Classes

Instructional Clarity in Mathematics Lessons

Students who report experiencing high-clarity instruction tend to have higher average mathematics achievement internationally than students who experience instruction of lower clarity. The TIMSS 2023 *Instructional Clarity in Mathematics Lessons* scale (Exhibit 5.2.1) includes items that asked students to indicate their agreement with different statements about their teachers' provision of mathematics instruction, such as answering questions clearly or giving helpful feedback. Based on these responses, students were classified as experiencing "high clarity of instruction," "moderate clarity of instruction," or "low clarity of instruction."

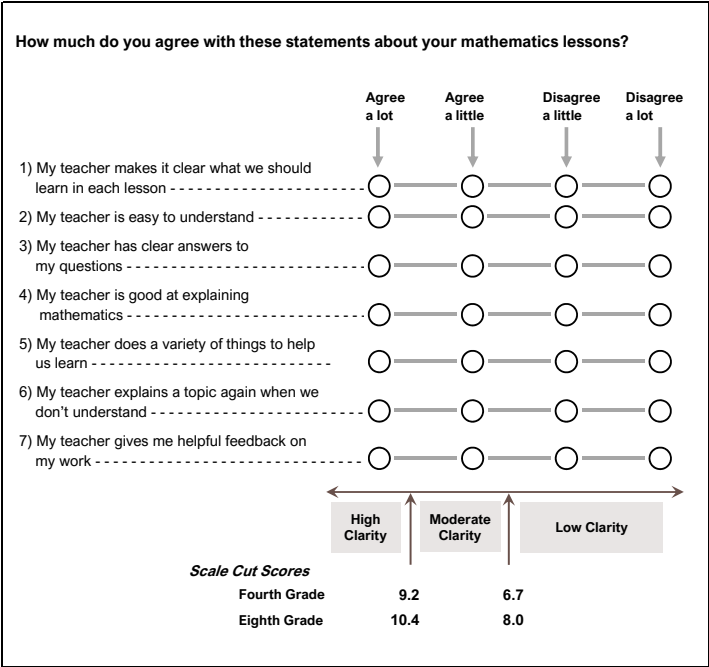
On average, 69 percent of fourth-grade students internationally reported "high clarity" of instruction during their mathematics lessons, 26 percent reported "moderate clarity," and just 5 percent reported their lessons as having "low clarity." On average internationally, student-reported higher instructional clarity was associated with higher average achievement (Exhibit 5.2.2). There was a 41-point difference in average mathematics achievement between fourth-grade students who experienced "high clarity" of instruction and the small percentage of students who experienced "low clarity" of instruction (513 vs. 472) while students who experienced "moderate clarity" of instruction had an average achievement in between (492).

A little less than half of eighth-grade students reported that their mathematics instruction had "high clarity" (48%). Thirty-six percent reported "moderate clarity" and 15 percent reported "low clarity." Internationally, there was a positive relationship between self-reports of instructional clarity and average mathematics achievement (Exhibit 5.2.3). There was a 29-point difference in average mathematics achievement between eighth-grade students who experienced "high clarity" of instruction and those who experienced "low clarity" of instruction (487 vs. 458). Students in the eighth grade who experienced "moderate clarity" of instruction had an average achievement of 470.

Exhibit 5.2.1: Instructional Clarity in Mathematics Lessons

About the Scale

Students were scored according to their responses to seven statements on the *Instructional Clarity in Mathematics Lessons* scale. Cut scores divide the scale into three categories. Students who reported **High Clarity of Instruction** in their mathematics lessons had a score at or above the cut score corresponding to “agreeing a lot” with four of the seven statements and “agreeing a little” with the other three, on average. Students who reported **Low Clarity of Instruction** in their mathematics lessons had a score at or below the cut score corresponding to “disagreeing a little” with four of the seven statements and “agreeing a little” with the other three, on average. All other students reported **Moderate Clarity of Instruction** in their mathematics lessons.



SOURCE: IEA's Trends in International Mathematics and Science Study - TIMSS 2023
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Exhibit 5.2.2: Instructional Clarity in Mathematics Lessons

Country	High Clarity of Instruction		Moderate Clarity of Instruction		Low Clarity of Instruction		Average Scale Score
	Percent of Students	Average Achievement	Percent of Students	Average Achievement	Percent of Students	Average Achievement	
Albania	91 (0.8)	518 (5.1)	7 (0.7)	479 (8.5)	1 ~	~ ~	11.2 (0.05)
Armenia	87 (0.8)	522 (2.5)	12 (0.7)	492 (5.8)	2 ~	~ ~	11.1 (0.04)
Australia	68 (1.2)	533 (2.8)	27 (1.0)	525 (4.3)	5 (0.5)	501 (7.6)	9.9 (0.05)
Azerbaijan	81 (0.9)	514 (3.2)	16 (0.7)	464 (5.2)	4 (0.4)	426 (8.4)	10.6 (0.04)
Bahrain	75 (1.1)	476 (4.3)	20 (0.8)	443 (5.1)	5 (0.6)	410 (10.1)	10.3 (0.06)
Belgium (Flemish)	71 (1.1)	526 (2.1)	26 (1.0)	516 (3.3)	3 (0.3)	505 (9.3)	10.1 (0.05)
Belgium (French)	63 (1.1)	494 (2.5)	32 (1.0)	488 (3.1)	5 (0.5)	471 (7.1)	9.7 (0.05)
Bosnia & Herzegovina	68 (1.3)	459 (3.3)	29 (1.4)	447 (4.9)	3 (0.4)	425 (10.9)	10.2 (0.05)
Brazil	67 (0.8)	421 (3.9)	28 (0.7)	401 (4.9)	5 (0.3)	347 (7.0)	9.8 (0.03)
Bulgaria	83 (1.2)	531 (4.0)	15 (0.9)	529 (6.9)	2 ~	~ ~	10.7 (0.06)
Canada	72 (0.8)	513 (2.1)	25 (0.7)	496 (2.7)	4 (0.3)	472 (6.4)	10.1 (0.03)
Chile	67 (1.1)	453 (2.8)	28 (1.0)	439 (3.8)	5 (0.4)	406 (8.7)	10.0 (0.05)
Chinese Taipei	60 (1.2)	612 (1.9)	32 (0.9)	607 (2.3)	8 (0.7)	581 (4.5)	9.6 (0.06)
Cyprus	76 (1.0)	522 (2.7)	20 (0.9)	510 (3.6)	4 (0.4)	488 (7.3)	10.3 (0.05)
Czech Republic	62 (1.2)	534 (2.5)	32 (1.0)	532 (2.7)	6 (0.5)	505 (6.3)	9.7 (0.05)
Denmark	51 (1.7)	536 (2.9)	39 (1.2)	517 (2.7)	11 (0.8)	501 (4.9)	9.1 (0.07)
England	69 (1.1)	560 (3.5)	26 (0.8)	551 (4.2)	5 (0.5)	511 (7.9)	10.0 (0.05)
Finland	65 (1.1)	536 (2.4)	30 (1.1)	528 (3.3)	5 (0.4)	501 (6.8)	9.8 (0.04)
France	55 (1.2)	488 (2.9)	39 (1.0)	487 (3.8)	6 (0.5)	458 (7.0)	9.4 (0.05)
Georgia	84 (1.0)	508 (2.9)	14 (0.9)	472 (5.6)	1 ~	~ ~	11.0 (0.05)
Germany	61 (1.1)	533 (2.3)	32 (0.9)	521 (3.3)	7 (0.5)	493 (4.9)	9.6 (0.05)
Hong Kong SAR	61 (1.1)	607 (4.3)	31 (0.8)	583 (4.7)	8 (0.6)	558 (7.4)	9.7 (0.05)
Hungary	65 (1.2)	532 (3.7)	29 (0.9)	511 (4.7)	6 (0.6)	498 (7.7)	9.8 (0.06)
Iran, Islamic Rep. of	86 (0.8)	430 (3.8)	12 (0.8)	385 (9.3)	3 (0.2)	356 (11.2)	10.9 (0.04)
Ireland	69 (1.3)	546 (3.1)	27 (1.1)	548 (3.9)	4 (0.5)	538 (8.3)	10.0 (0.05)
Italy	63 (1.2)	523 (3.1)	32 (1.1)	502 (4.2)	5 (0.5)	498 (7.5)	9.7 (0.05)
Japan	49 (1.7)	595 (2.2)	44 (1.3)	590 (3.1)	7 (0.9)	586 (6.2)	9.3 (0.08)
Jordan	76 (1.6)	441 (5.8)	17 (1.2)	404 (6.8)	7 (0.6)	382 (11.6)	10.5 (0.08)
Kazakhstan	61 (1.2)	500 (3.7)	36 (1.1)	480 (4.0)	4 (0.3)	439 (8.4)	9.6 (0.05)
Korea, Rep. of	74 (1.0)	601 (2.7)	23 (0.9)	579 (3.7)	3 (0.4)	568 (10.8)	10.2 (0.05)
Kosovo	87 (1.0)	462 (3.3)	11 (0.7)	417 (6.0)	2 ~	~ ~	11.1 (0.05)
Kuwait	70 (1.2)	404 (4.6)	25 (1.0)	371 (6.1)	5 (0.4)	328 (9.4)	10.1 (0.06)
Latvia	47 (1.3)	534 (3.2)	43 (1.1)	538 (3.2)	10 (0.7)	529 (5.5)	9.0 (0.05)
Lithuania	63 (1.2)	570 (2.9)	31 (0.9)	554 (3.5)	6 (0.5)	535 (7.9)	9.7 (0.05)
Macao SAR	55 (0.7)	595 (1.6)	36 (0.6)	572 (1.8)	9 (0.3)	545 (4.0)	9.4 (0.02)
Montenegro	74 (0.8)	490 (2.0)	22 (0.7)	458 (3.5)	4 (0.4)	437 (8.1)	10.3 (0.04)
Morocco	84 (1.1)	404 (5.0)	14 (1.0)	345 (6.1)	2 ~	~ ~	10.8 (0.06)
Netherlands	71 (1.1)	543 (2.1)	26 (1.0)	529 (3.4)	3 (0.4)	502 (9.2)	10.0 (0.05)
New Zealand	61 (1.0)	496 (2.8)	33 (0.9)	494 (3.4)	6 (0.5)	477 (6.4)	9.6 (0.05)
North Macedonia	85 (0.8)	488 (3.4)	13 (0.7)	447 (5.9)	3 (0.3)	425 (10.7)	10.9 (0.04)
Norway (5)	59 (1.2)	535 (2.6)	36 (1.2)	531 (2.3)	5 (0.5)	509 (6.0)	9.5 (0.05)
Oman	64 (0.9)	441 (4.7)	29 (0.8)	405 (4.1)	7 (0.4)	376 (6.6)	9.7 (0.04)
Poland	44 (1.1)	555 (2.8)	44 (0.9)	546 (2.4)	12 (0.7)	524 (3.8)	8.8 (0.05)
Portugal	77 (1.0)	524 (3.0)	21 (1.0)	504 (3.8)	2 ~	~ ~	10.3 (0.04)
Qatar	72 (0.8)	480 (3.6)	22 (0.6)	448 (4.1)	7 (0.5)	412 (7.2)	10.2 (0.04)
Romania	86 (0.9)	552 (4.3)	12 (0.7)	531 (8.7)	3 (0.6)	517 (20.6)	10.9 (0.05)
Saudi Arabia	72 (0.9)	442 (4.3)	21 (0.7)	406 (5.3)	7 (0.5)	380 (8.2)	10.2 (0.05)
Serbia	81 (1.0)	530 (3.1)	16 (0.9)	507 (4.8)	3 (0.3)	490 (10.4)	10.6 (0.05)
Singapore	62 (1.0)	624 (2.9)	31 (0.8)	606 (3.7)	7 (0.4)	577 (6.0)	9.7 (0.04)
Slovak Republic	69 (1.4)	514 (3.7)	27 (1.1)	524 (3.6)	4 (0.5)	508 (7.3)	10.0 (0.06)
Slovenia	61 (1.0)	520 (2.1)	34 (0.9)	515 (2.5)	5 (0.4)	477 (6.2)	9.6 (0.04)
South Africa (5)	66 (1.3)	378 (4.3)	28 (1.0)	336 (4.7)	6 (0.5)	312 (8.8)	9.8 (0.06)
Spain	77 (0.8)	504 (2.1)	19 (0.7)	487 (3.4)	4 (0.3)	475 (7.2)	10.3 (0.04)
Sweden	59 (1.5)	535 (3.2)	36 (1.3)	531 (2.8)	5 (0.5)	497 (8.5)	9.6 (0.05)
Türkiye (5)	76 (1.1)	562 (3.8)	20 (0.9)	529 (6.6)	4 (0.4)	514 (10.7)	10.2 (0.05)
United Arab Emirates	74 (0.4)	517 (1.2)	21 (0.3)	470 (2.2)	5 (0.2)	433 (3.6)	10.3 (0.02)
United States	68 (0.8)	532 (3.1)	26 (0.7)	506 (3.8)	6 (0.3)	469 (5.4)	9.9 (0.04)
Uzbekistan	81 (1.0)	457 (3.2)	15 (0.9)	403 (3.9)	4 (0.4)	382 (7.7)	10.8 (0.05)
International Average	69 (0.1)	513 (0.4)	26 (0.1)	492 (0.6)	5 (0.1)	472 (1.2)	
Benchmarking Participants							
Ontario, Canada	72 (1.3)	512 (3.4)	24 (1.2)	495 (4.3)	4 (0.5)	476 (11.5)	10.1 (0.06)
Quebec, Canada	69 (1.1)	521 (2.6)	28 (0.9)	509 (3.9)	4 (0.4)	482 (8.1)	9.9 (0.05)
Abu Dhabi, UAE	67 (0.7)	484 (2.0)	26 (0.6)	432 (3.0)	7 (0.4)	400 (5.2)	9.9 (0.04)
Dubai, UAE	78 (0.6)	568 (1.6)	18 (0.6)	535 (3.3)	4 (0.3)	503 (6.8)	10.4 (0.03)
Sharjah, UAE	78 (1.1)	518 (3.2)	18 (0.8)	481 (4.3)	4 (0.5)	439 (8.0)	10.5 (0.05)

This TIMSS context questionnaire scale was established in 2023 based on the combined response distribution of countries that participated in TIMSS 2023. To provide a point of reference for country comparisons, the scale centerpoint of 10 was located at the mean of the combined distribution. The units of the scale were chosen so that 2 scale score points corresponded to the standard deviation of the distribution.

(.) Standard errors appear in parentheses. Because of rounding some results may appear inconsistent.

An "r" indicates data are available for at least 70% but less than 85% of the students.

A tilde (~) indicates insufficient data to report result.

SOURCE: IEA's Trends in International Mathematics and Science Study - TIMSS 2023
Downloaded from <https://timss2023.org/results>

Exhibit 5.2.3: Instructional Clarity in Mathematics Lessons

Country	High Clarity of Instruction		Moderate Clarity of Instruction		Low Clarity of Instruction		Average Scale Score
	Percent of Students	Average Achievement	Percent of Students	Average Achievement	Percent of Students	Average Achievement	
Australia	39 (1.5)	529 (4.3)	39 (1.1)	510 (4.0)	22 (1.3)	493 (4.5)	9.6 (0.07)
Austria	32 (1.2)	518 (4.0)	45 (0.9)	514 (2.4)	23 (1.2)	508 (4.6)	9.4 (0.06)
Azerbaijan	67 (1.3)	494 (4.2)	24 (1.0)	472 (5.0)	8 (0.6)	470 (6.9)	10.8 (0.05)
Bahrain	61 (1.3)	444 (2.8)	27 (0.8)	420 (3.4)	12 (0.8)	399 (5.7)	10.5 (0.06)
Brazil	50 (1.5)	392 (3.7)	36 (1.3)	380 (5.0)	14 (0.7)	372 (4.1)	10.1 (0.06)
Chile	46 (1.7)	428 (3.5)	41 (1.2)	414 (3.4)	13 (1.1)	404 (5.3)	10.1 (0.08)
Chinese Taipei	37 (1.3)	622 (3.7)	49 (1.0)	597 (3.3)	14 (0.9)	574 (6.2)	9.8 (0.06)
Cote d'Ivoire	64 (1.8)	265 (3.9)	32 (1.5)	262 (7.8)	4 (0.5)	251 (10.6)	10.6 (0.06)
Cyprus	40 (1.3)	517 (4.5)	37 (0.9)	494 (2.8)	24 (1.0)	477 (3.4)	9.6 (0.06)
Czech Republic	34 (1.3)	523 (2.8)	44 (1.0)	520 (2.8)	22 (1.4)	510 (4.1)	9.4 (0.07)
England	38 (1.7)	547 (5.4)	40 (1.2)	529 (5.2)	21 (1.3)	496 (6.7)	9.6 (0.07)
Finland	36 (1.1)	521 (3.7)	43 (0.9)	508 (2.8)	21 (1.1)	487 (3.4)	9.6 (0.05)
France	26 (1.7)	498 (4.2)	48 (1.1)	484 (3.6)	26 (1.9)	465 (4.5)	9.1 (0.09)
Georgia	65 (1.5)	476 (3.8)	28 (1.1)	463 (3.7)	8 (0.6)	458 (6.9)	10.8 (0.06)
Hong Kong SAR	36 (1.6)	589 (5.4)	47 (1.1)	574 (5.5)	18 (1.2)	557 (8.8)	9.7 (0.08)
Hungary	34 (1.3)	521 (4.5)	43 (1.0)	501 (4.2)	23 (1.2)	497 (4.9)	9.4 (0.06)
Iran, Islamic Rep. of	53 (1.2)	430 (4.2)	32 (0.7)	419 (4.5)	15 (0.9)	413 (4.2)	10.2 (0.05)
Ireland	42 (1.5)	526 (3.6)	37 (1.0)	523 (3.4)	22 (1.0)	516 (5.0)	9.7 (0.07)
Israel	42 (1.3)	497 (5.7)	35 (0.9)	491 (4.2)	23 (1.1)	480 (5.3)	9.7 (0.06)
Italy	39 (1.8)	513 (3.3)	42 (1.2)	498 (3.8)	19 (1.5)	491 (4.7)	9.7 (0.08)
Japan	36 (1.5)	605 (3.3)	53 (1.3)	593 (3.7)	11 (1.0)	575 (6.5)	9.8 (0.06)
Jordan	65 (1.2)	402 (3.5)	26 (1.0)	377 (3.7)	9 (0.6)	378 (6.3)	10.7 (0.05)
Kazakhstan	43 (1.3)	472 (4.8)	50 (1.2)	447 (3.6)	7 (0.6)	422 (6.1)	10.0 (0.05)
Korea, Rep. of	48 (1.4)	611 (3.3)	39 (0.9)	590 (3.7)	12 (1.2)	561 (7.3)	10.1 (0.06)
Kuwait	54 (1.4)	414 (5.9)	31 (0.8)	390 (5.5)	15 (1.1)	382 (5.9)	10.2 (0.07)
Lithuania	39 (1.5)	531 (4.0)	42 (0.9)	510 (3.9)	19 (1.1)	497 (4.6)	9.7 (0.06)
Malaysia	53 (1.2)	418 (3.6)	40 (0.9)	404 (3.6)	7 (0.6)	400 (8.2)	10.4 (0.05)
Malta	47 (0.8)	512 (2.0)	32 (0.8)	504 (2.5)	21 (0.5)	489 (3.7)	9.8 (0.03)
Morocco	60 (1.0)	383 (3.1)	30 (0.7)	376 (3.8)	10 (0.6)	373 (4.9)	10.5 (0.04)
Norway (9)	32 (1.2)	516 (3.1)	45 (0.9)	508 (2.5)	23 (1.0)	485 (3.8)	9.4 (0.05)
Oman	53 (1.2)	432 (2.7)	34 (0.8)	403 (3.8)	13 (0.7)	389 (4.2)	10.2 (0.05)
Palestinian Nat'l Auth.	60 (1.0)	403 (3.2)	26 (0.8)	373 (3.6)	14 (0.6)	359 (4.3)	10.4 (0.04)
Portugal	40 (1.4)	487 (2.9)	40 (1.1)	473 (3.7)	21 (1.4)	462 (5.2)	9.6 (0.07)
Qatar	55 (1.7)	465 (4.8)	29 (0.9)	456 (4.5)	16 (1.3)	429 (7.1)	10.3 (0.09)
Romania	57 (1.7)	509 (4.8)	29 (1.1)	492 (6.1)	14 (1.2)	494 (7.8)	10.4 (0.07)
Saudi Arabia	68 (1.2)	411 (3.4)	24 (0.8)	389 (4.4)	8 (0.7)	381 (6.5)	10.9 (0.06)
Singapore	46 (1.5)	624 (5.8)	40 (0.9)	596 (6.6)	14 (1.2)	575 (10.0)	10.1 (0.07)
South Africa (9)	55 (1.5)	399 (3.5)	35 (1.0)	388 (3.4)	10 (0.9)	406 (6.7)	10.3 (0.06)
Sweden	34 (1.5)	537 (3.5)	43 (1.0)	519 (3.1)	23 (1.6)	511 (4.0)	9.5 (0.08)
Türkiye	61 (1.4)	520 (4.6)	29 (1.0)	493 (5.3)	11 (0.8)	491 (9.4)	10.5 (0.06)
United Arab Emirates	60 (0.7)	505 (2.2)	28 (0.5)	485 (2.2)	12 (0.4)	460 (2.8)	10.6 (0.03)
United States	48 (1.5)	504 (4.8)	36 (1.0)	482 (4.2)	16 (1.0)	480 (6.4)	10.0 (0.06)
Uzbekistan	80 (1.0)	430 (4.8)	17 (0.8)	404 (4.8)	4 (0.4)	383 (8.1)	11.4 (0.04)
International Average	48 (0.2)	487 (0.6)	36 (0.2)	470 (0.6)	15 (0.2)	458 (0.9)	
Benchmarking Participants							
Abu Dhabi, UAE	54 (1.1)	478 (3.1)	31 (0.6)	451 (3.0)	14 (0.7)	430 (3.8)	10.3 (0.05)
Dubai, UAE	59 (1.3)	562 (3.2)	29 (1.0)	538 (3.7)	12 (0.7)	510 (5.2)	10.5 (0.05)
Sharjah, UAE	67 (2.0)	504 (6.0)	24 (1.5)	491 (4.8)	9 (0.9)	467 (6.1)	10.9 (0.09)

This TIMSS context questionnaire scale was established in 2023 based on the combined response distribution of countries that participated in TIMSS 2023. To provide a point of reference for country comparisons, the scale centerpoint of 10 was located at the mean of the combined distribution. The units of the scale were chosen so that 2 scale score points corresponded to the standard deviation of the distribution.

() Standard errors appear in parentheses. Because of rounding some results may appear inconsistent.

SOURCE: IEA's Trends in International Mathematics and Science Study - TIMSS 2023
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Disorderly Behavior During Mathematics Lessons

Students' reports of disorderly behavior during mathematics classes have a negative relationship with average mathematics achievement. The TIMSS 2023 *Disorderly Behavior During Mathematics Lessons* scale (Exhibit 5.2.4) includes items that asked students to report the frequency with which students engaged in disruptive behaviors during mathematics lessons. Based on their responses, students were assigned into one of three categories on the scale: experiencing disorderly behavior during “few or no lessons,” “some lessons,” or “most lessons.” Higher scale scores indicate less disruption than lower scale scores.

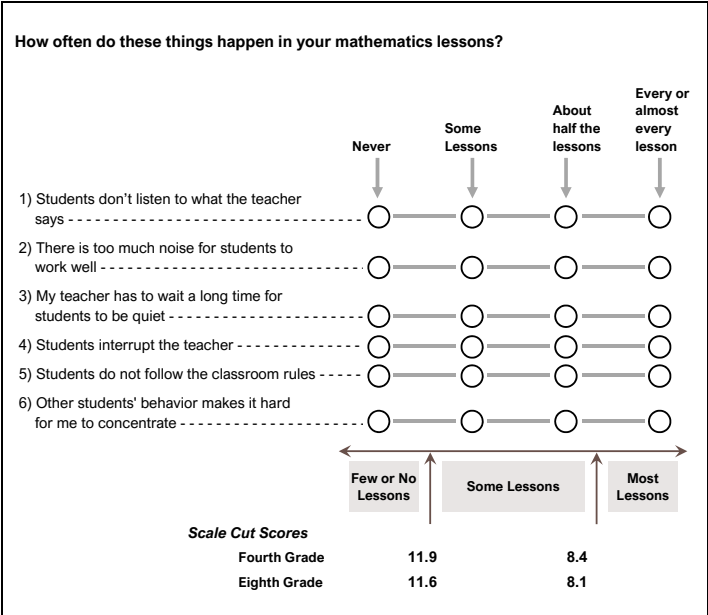
In fourth grade, the majority of students (65%) reported disorderly behavior in “some lessons,” on average, with slightly less than 20 percent of students reporting disorderly behavior in “most lessons” (19%). Fewer students in fourth grade reported disruption in “few or no lessons” (16%). Internationally and in many countries, there was a clear negative association between the frequency of disorderly behavior and average mathematics achievement in the fourth grade, with average achievement decreasing with higher frequencies of disorderly behavior (Exhibit 5.2.5). Students who reported experiencing disorderly behavior in “most lessons” had the lowest average mathematics achievement (486) compared to those who reported disruption only in “some lessons” (507) or “few or no lessons” (514).

A majority of eighth-grade students internationally reported disorderly behavior in “some lessons” (61%) and 17 percent of students reported disorderly behavior in “most lessons,” on average. Twenty-two percent of eighth-grade students reported disorderly behavior in “few or no lessons.” A negative relationship between average mathematics achievement and increased disorder was observed internationally in the eighth grade (Exhibit 5.2.6). Students who reported experiencing disorderly behavior in “most lessons” had the lowest average mathematics achievement (456) compared to those who reported disruption only in “some lessons” (473) or “few or no lessons” (486).

Exhibit 5.2.4: Disorderly Behavior During Mathematics Lessons

About the Scale

Students were scored according to their responses to six statements on the *Disorderly Behavior During Mathematics Lessons* scale. Cut scores divide the scale into three categories. Students who reported disorderly behavior in **Few or No Lessons** had a score at or above the cut score corresponding to reporting that three of the six situations “never” happened in their mathematics lessons and the other three happened in “some lessons,” on average. Students who reported disorderly behavior in **Most Lessons** had a score at or below the cut score corresponding to reporting that three of the six situations happened in “every or almost every lesson” and the other three happened in “about half the lessons,” on average. All other students reported disorderly behavior in **Some Lessons**.



SOURCE: IEA's Trends in International Mathematics and Science Study - TIMSS 2023
Downloaded from <https://timss2023.org/results>

Exhibit 5.2.5: Disorderly Behavior During Mathematics Lessons

Country	Few or No Lessons		Some Lessons		Most Lessons		Average Scale Score
	Percent of Students	Average Achievement	Percent of Students	Average Achievement	Percent of Students	Average Achievement	
Albania	41 (2.2)	526 (6.1)	46 (1.7)	513 (5.3)	13 (1.3)	486 (8.1)	11.3 (0.13)
Armenia	35 (1.6)	527 (3.1)	49 (1.3)	519 (3.0)	16 (0.9)	493 (4.3)	10.9 (0.08)
Australia	5 (0.4)	556 (7.8)	70 (1.0)	536 (2.8)	24 (1.1)	506 (4.3)	9.4 (0.05)
Azerbaijan	24 (1.2)	516 (4.8)	60 (1.1)	503 (3.4)	17 (0.8)	482 (3.9)	10.4 (0.07)
Bahrain	22 (1.4)	486 (5.5)	55 (1.0)	464 (5.1)	23 (1.2)	450 (5.4)	10.1 (0.09)
Belgium (Flemish)	6 (0.5)	533 (5.1)	80 (0.9)	525 (2.1)	13 (0.9)	509 (4.9)	9.8 (0.04)
Belgium (French)	7 (0.6)	500 (6.7)	73 (1.1)	497 (2.5)	20 (1.1)	469 (3.7)	9.6 (0.05)
Bosnia & Herzegovina	12 (1.3)	458 (6.1)	59 (1.3)	463 (3.5)	29 (1.6)	432 (5.1)	9.5 (0.10)
Brazil	5 (0.5)	394 (7.6)	62 (0.9)	415 (4.2)	33 (0.9)	408 (4.0)	9.1 (0.04)
Bulgaria	40 (2.4)	544 (4.9)	54 (2.1)	530 (4.6)	6 (0.8)	457 (11.9)	11.4 (0.11)
Canada	7 (0.4)	525 (5.4)	71 (0.9)	511 (2.2)	21 (1.0)	489 (2.7)	9.6 (0.04)
Chile	7 (0.6)	448 (6.0)	60 (1.1)	456 (3.0)	33 (1.2)	428 (3.1)	9.2 (0.06)
Chinese Taipei	18 (1.1)	599 (3.5)	63 (1.2)	612 (1.8)	20 (1.3)	605 (3.2)	10.1 (0.07)
Cyprus	12 (1.1)	525 (5.6)	66 (1.1)	522 (2.4)	22 (1.1)	503 (3.9)	9.7 (0.06)
Czech Republic	8 (0.7)	542 (5.5)	68 (1.1)	537 (2.4)	25 (1.2)	514 (3.2)	9.5 (0.06)
Denmark	7 (0.6)	541 (5.3)	82 (0.6)	526 (2.1)	11 (0.7)	511 (4.7)	10.0 (0.04)
England	7 (0.6)	582 (8.1)	71 (1.2)	561 (3.3)	22 (1.4)	529 (4.0)	9.6 (0.06)
Finland	16 (1.0)	540 (3.8)	75 (0.9)	533 (2.5)	9 (0.6)	505 (5.9)	10.4 (0.05)
France	9 (0.9)	497 (5.2)	72 (1.1)	492 (3.1)	20 (1.0)	461 (4.2)	9.7 (0.05)
Georgia	20 (1.3)	511 (5.2)	62 (1.3)	507 (2.9)	18 (0.9)	478 (4.6)	10.2 (0.07)
Germany	7 (0.6)	531 (5.8)	76 (0.9)	530 (2.3)	17 (0.9)	509 (4.2)	9.7 (0.04)
Hong Kong SAR	24 (1.3)	595 (4.1)	61 (1.2)	598 (4.3)	15 (1.4)	590 (9.3)	10.5 (0.09)
Hungary	15 (1.0)	542 (5.0)	69 (1.1)	526 (3.5)	17 (1.0)	500 (6.1)	10.0 (0.06)
Iran, Islamic Rep. of	15 (1.1)	424 (6.4)	60 (1.1)	424 (4.8)	26 (1.1)	419 (4.8)	9.7 (0.07)
Ireland	11 (1.1)	558 (5.8)	73 (1.4)	552 (2.7)	16 (1.5)	512 (5.6)	10.0 (0.08)
Italy	9 (0.8)	529 (6.7)	74 (0.9)	518 (2.9)	17 (1.0)	499 (4.1)	9.8 (0.05)
Japan	37 (1.8)	597 (3.0)	55 (1.6)	593 (2.6)	7 (0.7)	562 (7.7)	11.2 (0.08)
Jordan	27 (2.1)	457 (9.0)	51 (1.5)	421 (5.5)	22 (1.4)	415 (5.9)	10.4 (0.14)
Kazakhstan	28 (1.2)	507 (4.6)	56 (1.1)	491 (3.6)	16 (0.7)	462 (4.5)	10.6 (0.06)
Korea, Rep. of	24 (1.6)	595 (3.6)	67 (1.4)	595 (3.0)	10 (0.9)	591 (5.0)	10.7 (0.08)
Kosovo	25 (1.1)	464 (4.4)	57 (1.2)	460 (4.1)	18 (1.1)	427 (4.6)	10.4 (0.06)
Kuwait	15 (1.0)	404 (7.2)	61 (1.1)	395 (4.6)	24 (1.3)	380 (7.0)	9.8 (0.08)
Latvia	8 (0.9)	542 (5.2)	68 (1.2)	540 (2.9)	25 (1.3)	521 (4.3)	9.5 (0.07)
Lithuania	12 (0.9)	570 (5.6)	70 (1.1)	567 (2.9)	18 (1.1)	540 (4.4)	9.9 (0.06)
Macao SAR	17 (0.5)	595 (2.9)	67 (0.6)	582 (1.5)	17 (0.4)	572 (3.0)	10.2 (0.02)
Montenegro	17 (0.7)	497 (2.9)	58 (0.8)	481 (2.7)	25 (0.9)	469 (2.6)	9.8 (0.05)
Morocco	24 (2.1)	433 (9.1)	63 (1.9)	386 (4.5)	13 (0.9)	370 (4.9)	10.5 (0.09)
Netherlands	8 (0.8)	536 (5.4)	80 (0.9)	541 (2.2)	12 (1.0)	522 (4.3)	10.0 (0.06)
New Zealand	3 (0.3)	512 (8.8)	69 (1.1)	501 (3.0)	27 (1.2)	475 (3.5)	9.2 (0.04)
North Macedonia	27 (1.2)	495 (4.5)	54 (1.1)	483 (4.0)	20 (1.1)	455 (5.5)	10.4 (0.07)
Norway (5)	7 (0.7)	528 (6.2)	80 (0.9)	535 (2.1)	14 (0.8)	516 (4.0)	10.0 (0.05)
Oman	17 (0.9)	455 (8.7)	58 (1.0)	422 (4.0)	25 (0.9)	411 (4.4)	9.8 (0.05)
Poland	11 (0.9)	550 (5.1)	70 (1.1)	551 (2.1)	19 (1.2)	530 (4.4)	9.8 (0.07)
Portugal	10 (0.7)	530 (6.0)	71 (1.1)	523 (2.9)	20 (1.2)	493 (4.3)	9.8 (0.06)
Qatar	18 (0.9)	467 (4.9)	58 (1.0)	472 (3.8)	24 (0.9)	460 (4.7)	10.0 (0.05)
Romania	18 (1.4)	547 (7.0)	60 (1.5)	554 (4.9)	22 (1.6)	531 (5.9)	10.1 (0.09)
Saudi Arabia	24 (1.2)	453 (6.0)	53 (1.0)	422 (4.3)	23 (0.8)	416 (4.7)	10.2 (0.07)
Serbia	17 (1.4)	528 (7.9)	62 (1.3)	529 (3.3)	21 (1.2)	512 (3.8)	10.1 (0.09)
Slovak Republic	13 (1.5)	504 (11.6)	67 (1.5)	522 (3.4)	20 (1.2)	507 (5.5)	9.9 (0.08)
Slovenia	10 (0.8)	528 (4.4)	71 (1.0)	522 (1.9)	19 (0.9)	489 (2.8)	9.8 (0.05)
South Africa (5)	8 (0.7)	358 (9.6)	68 (1.0)	358 (4.4)	24 (1.0)	376 (5.5)	9.5 (0.05)
Spain	4 (0.4)	501 (6.7)	71 (1.0)	506 (2.3)	25 (1.1)	484 (2.8)	9.3 (0.04)
Sweden	11 (0.9)	558 (4.3)	75 (1.0)	532 (2.6)	15 (1.2)	509 (5.4)	10.0 (0.07)
Türkiye (5)	12 (0.8)	565 (6.1)	68 (0.9)	553 (4.3)	20 (1.0)	550 (5.9)	9.8 (0.06)
United Arab Emirates	19 (0.5)	524 (2.4)	58 (0.5)	505 (1.4)	23 (0.5)	480 (2.3)	10.1 (0.03)
United States	8 (0.5)	528 (6.1)	68 (0.8)	529 (3.3)	24 (0.9)	498 (3.7)	9.5 (0.04)
Uzbekistan	35 (1.5)	468 (3.7)	48 (1.3)	442 (3.1)	17 (0.9)	416 (4.9)	10.9 (0.08)
International Average	16 (0.1)	514 (0.8)	65 (0.2)	507 (0.4)	19 (0.1)	486 (0.7)	
Singapore	--	--	--	--	--	--	--
Benchmarking Participants							
Ontario, Canada	6 (0.6)	515 (8.0)	70 (1.7)	511 (3.7)	25 (1.7)	493 (3.7)	9.4 (0.06)
Quebec, Canada	9 (0.8)	532 (5.0)	74 (0.9)	520 (2.8)	16 (1.2)	495 (4.3)	9.9 (0.06)
Abu Dhabi, UAE	12 (0.6)	487 (4.7)	61 (0.7)	467 (2.0)	27 (0.8)	448 (3.4)	9.6 (0.05)
Dubai, UAE	18 (0.8)	572 (3.2)	63 (1.0)	563 (1.9)	19 (0.9)	536 (3.2)	10.1 (0.05)
Sharjah, UAE	27 (1.6)	529 (4.9)	53 (1.2)	503 (3.1)	20 (1.0)	490 (4.5)	10.5 (0.09)

This TIMSS context questionnaire scale was established in 2023 based on the combined response distribution of countries that participated in TIMSS 2023. To provide a point of reference for country comparisons, the scale centerpoint of 10 was located at the mean of the combined distribution. The units of the scale were chosen so that 2 scale score points corresponded to the standard deviation of the distribution.

() Standard errors appear in parentheses. Because of rounding some results may appear inconsistent.

An "r" indicates data are available for at least 70% but less than 85% of the students.

A dash (-) indicates comparable data not available.

SOURCE: IEA's Trends in International Mathematics and Science Study - TIMSS 2023
Downloaded from <https://timss2023.org/results>



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Exhibit 5.2.6: Disorderly Behavior During Mathematics Lessons

Country	Few or No Lessons		Some Lessons		Most Lessons		Average Scale Score
	Percent of Students	Average Achievement	Percent of Students	Average Achievement	Percent of Students	Average Achievement	
Australia	10 (0.7)	532 (6.7)	66 (1.0)	517 (3.6)	25 (1.2)	495 (4.5)	9.3 (0.06)
Austria	22 (1.4)	526 (3.9)	65 (1.3)	512 (2.4)	13 (1.1)	503 (4.6)	10.1 (0.07)
Azerbaijan	29 (1.1)	506 (4.7)	56 (0.9)	482 (4.4)	16 (0.8)	471 (5.8)	10.3 (0.06)
Bahrain	24 (1.0)	452 (4.3)	57 (1.0)	432 (3.0)	19 (0.9)	407 (4.0)	10.0 (0.05)
Brazil	6 (0.5)	392 (9.0)	59 (0.9)	389 (3.9)	35 (1.0)	377 (3.8)	8.8 (0.04)
Chile	7 (0.6)	421 (7.3)	68 (1.1)	422 (3.5)	25 (1.2)	411 (4.0)	9.2 (0.05)
Chinese Taipei	34 (1.7)	596 (4.7)	55 (1.3)	607 (3.1)	11 (1.0)	607 (6.3)	10.8 (0.09)
Cote d'Ivoire	19 (1.3)	264 (8.1)	69 (1.1)	263 (4.9)	12 (0.8)	263 (5.0)	9.9 (0.07)
Cyprus	15 (1.0)	514 (5.4)	61 (0.9)	498 (3.1)	23 (1.1)	493 (3.8)	9.5 (0.06)
Czech Republic	18 (1.0)	528 (3.6)	67 (0.9)	520 (2.5)	15 (0.9)	505 (3.8)	9.9 (0.06)
England	19 (1.4)	567 (6.7)	63 (1.2)	528 (4.5)	18 (1.3)	493 (8.0)	9.9 (0.08)
Finland	17 (0.9)	515 (4.5)	71 (0.9)	509 (2.6)	12 (0.7)	494 (3.9)	10.0 (0.05)
France	20 (1.6)	499 (4.6)	62 (1.3)	484 (3.1)	18 (1.4)	460 (5.1)	9.9 (0.09)
Georgia	21 (1.1)	481 (6.1)	63 (1.1)	470 (3.6)	16 (0.9)	456 (5.2)	10.0 (0.06)
Hong Kong SAR	26 (1.2)	574 (5.1)	61 (1.2)	577 (5.9)	13 (0.9)	577 (8.4)	10.3 (0.07)
Hungary	23 (1.5)	518 (5.0)	65 (1.4)	507 (4.0)	12 (0.9)	482 (6.3)	10.2 (0.07)
Iran, Islamic Rep. of	14 (0.8)	436 (5.5)	64 (0.8)	427 (3.8)	22 (1.0)	409 (4.1)	9.5 (0.05)
Ireland	35 (1.4)	540 (2.7)	54 (1.3)	518 (4.0)	10 (0.9)	495 (6.1)	10.6 (0.07)
Israel	19 (1.1)	517 (6.3)	62 (1.0)	490 (4.1)	19 (0.8)	468 (5.5)	9.8 (0.06)
Italy	18 (1.2)	501 (4.4)	70 (1.2)	504 (3.3)	12 (0.9)	493 (4.7)	10.0 (0.06)
Japan	62 (2.0)	599 (4.0)	36 (1.9)	590 (3.3)	2 ~	~ ~	11.9 (0.07)
Jordan	24 (0.9)	410 (4.4)	55 (0.8)	391 (3.4)	22 (0.8)	377 (4.5)	9.9 (0.05)
Kazakhstan	32 (1.3)	464 (5.2)	58 (1.1)	454 (3.2)	10 (0.7)	438 (6.4)	10.6 (0.06)
Korea, Rep. of	34 (1.6)	587 (4.1)	56 (1.4)	600 (3.4)	9 (0.7)	609 (7.1)	10.7 (0.07)
Kuwait	21 (1.0)	410 (7.0)	62 (1.0)	403 (5.2)	17 (0.9)	386 (7.1)	9.9 (0.06)
Lithuania	20 (1.2)	516 (4.9)	64 (1.0)	517 (3.4)	16 (1.0)	510 (5.3)	10.0 (0.06)
Malaysia	20 (0.8)	434 (4.1)	71 (0.7)	408 (3.5)	9 (0.5)	381 (5.6)	10.2 (0.04)
Malta	16 (0.6)	525 (3.4)	61 (0.7)	510 (1.9)	23 (0.6)	475 (3.0)	9.6 (0.03)
Morocco	18 (0.7)	386 (4.1)	63 (0.7)	377 (3.4)	20 (0.7)	380 (3.8)	9.7 (0.04)
Norway (9)	15 (1.0)	506 (4.5)	73 (0.9)	508 (2.3)	12 (0.8)	488 (4.7)	10.0 (0.06)
Oman	15 (0.7)	433 (4.1)	65 (0.8)	415 (2.8)	20 (0.7)	404 (3.9)	9.5 (0.04)
Palestinian Nat'l Auth.	24 (1.0)	407 (3.7)	55 (0.9)	385 (3.1)	21 (0.7)	381 (3.9)	9.9 (0.05)
Portugal	9 (0.8)	488 (4.8)	68 (1.2)	477 (2.8)	24 (1.2)	471 (3.8)	9.3 (0.06)
Qatar	24 (1.4)	472 (7.8)	56 (1.2)	455 (4.3)	20 (1.1)	439 (5.3)	10.0 (0.07)
Romania	29 (1.8)	525 (5.1)	54 (1.5)	495 (4.8)	17 (1.4)	487 (8.3)	10.3 (0.10)
Saudi Arabia	28 (1.1)	416 (4.5)	54 (0.9)	403 (3.4)	18 (0.8)	383 (3.8)	10.2 (0.05)
South Africa (9)	7 (0.5)	417 (6.2)	71 (0.8)	394 (3.3)	22 (0.9)	396 (4.4)	9.2 (0.04)
Sweden	16 (1.3)	530 (6.0)	69 (1.3)	524 (2.5)	15 (1.2)	511 (4.8)	9.9 (0.07)
Türkiye	14 (0.9)	521 (7.5)	64 (1.0)	510 (4.4)	22 (1.1)	501 (6.5)	9.6 (0.06)
United Arab Emirates	27 (0.7)	512 (2.9)	52 (0.5)	495 (1.8)	21 (0.5)	468 (2.5)	10.1 (0.04)
United States	22 (1.3)	517 (6.1)	64 (1.3)	490 (4.4)	15 (0.9)	468 (4.8)	10.0 (0.06)
Uzbekistan	36 (1.5)	439 (6.4)	51 (1.2)	418 (3.9)	13 (0.8)	404 (4.7)	10.7 (0.07)
International Average	22 (0.2)	486 (0.8)	61 (0.2)	473 (0.6)	17 (0.1)	456 (0.8)	
Singapore	--	--	--	--	--	--	--
Benchmarking Participants							
Abu Dhabi, UAE	20 (0.8)	486 (4.1)	55 (0.8)	463 (2.8)	25 (0.9)	441 (3.4)	9.7 (0.05)
Dubai, UAE	26 (1.2)	574 (3.8)	58 (1.0)	546 (2.8)	16 (0.7)	520 (5.4)	10.2 (0.05)
Sharjah, UAE	35 (2.4)	507 (7.0)	47 (1.5)	498 (5.0)	18 (1.2)	482 (5.0)	10.4 (0.12)

This TIMSS context questionnaire scale was established in 2023 based on the combined response distribution of countries that participated in TIMSS 2023. To provide a point of reference for country comparisons, the scale centerpoint of 10 was located at the mean of the combined distribution. The units of the scale were chosen so that 2 scale score points corresponded to the standard deviation of the distribution.

() Standard errors appear in parentheses. Because of rounding some results may appear inconsistent.

A dash (-) indicates comparable data not available. A tilde (~) indicates insufficient data to report result.

SOURCE: IEA's Trends in International Mathematics and Science Study - TIMSS 2023
Downloaded from <https://timss2023.org/results>

Science Classes

Instructional Clarity in Science Lessons

Reports of experiencing high-clarity instruction is generally associated with higher average science achievement for fourth- and eighth-grade students. The TIMSS 2023 *Instructional Clarity in Science Lessons* scale (Exhibit 5.3.1) includes items that asked students to indicate their level of agreement with different statements about their teachers' science instruction. In countries where eighth-grade science is taught as separate subjects, students indicated their level of agreement for each science course in which they were enrolled (biology, chemistry, physics, earth science). Students were grouped into three categories based on their combined reports of the level of instructional clarity of their teachers: "high clarity of instruction," "moderate clarity of instruction," and "low clarity of instruction."

On average, 68 percent of fourth-grade students internationally reported "high clarity" of instruction in their science lessons, 26 percent reported "moderate clarity," and just 6 percent characterized their lessons as having "low clarity." On average, internationally and within most countries, higher clarity was associated with higher average science achievement for fourth-grade students (Exhibit 5.3.2). Across countries, the average achievement was 505 among students reporting "high clarity" of instruction, 483 among students reporting "moderate clarity" of instruction, and 471 among students reporting "low clarity" of instruction.

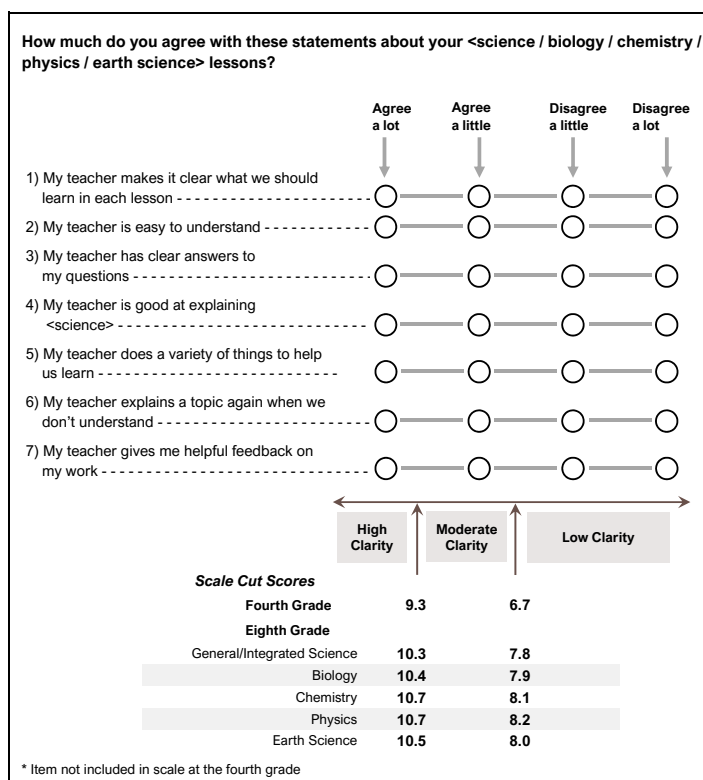
Eighth-grade students' reports are presented separately for countries where science is taught as an integrated subject in eighth grade (Exhibit 5.3.3a) and for countries in which science is taught as separate subjects (Exhibits 5.3.3b to 5.3.3e). In integrated science, about half of the students (51%) reported "high" instructional clarity, 35 percent reported "moderate" instructional clarity, and 14 percent reported "low" instructional clarity, on average. Generally, similar percentages of students reported "high," "moderate," and "low" instructional clarity for the separate science subjects of biology, chemistry, physics, and earth science. For these separate science subjects, 46 to 49 percent of eighth-grade students, on average, characterized instruction as having "high clarity," 36 to 37 percent reported "moderate clarity," and 14 to 18 percent reported "low clarity." On average, internationally and within most countries, reporting greater instructional clarity was associated with higher average science achievement for eighth-grade students (Exhibit 5.3.3a to 5.3.3e). In integrated science, students who reported experiencing "high" instructional clarity had an average achievement of 496, students who reported experiencing "moderate" instructional clarity had an average achievement of 477, and students who reported experiencing "low" instructional clarity had an average achievement of 462. Average achievement differences follow the same general pattern but are less pronounced in the separate science subjects. Students who reported experiencing "high" instructional clarity had the highest average science

achievement (ranging from 458 to 473 across subjects), but there were very small or no differences in average achievement between students who reported experiencing “moderate” or “low” instructional clarity (average achievement ranged from 448 to 456 and 448 to 453, respectively).

Exhibit 5.3.1: Instructional Clarity in Science Lessons

About the Scale

Students were scored according to their responses to seven statements on the *Instructional Clarity in Science Lessons* scale. Cut scores divide the scale into three categories. Students who reported **High Clarity of Instruction** in their science lessons had a score at or above the cut score corresponding to “agreeing a lot” with four of the seven statements and “agreeing a little” with the other three, on average. Students who reported **Low Clarity of Instruction** in their science lessons had a score at or below the cut score corresponding to “disagreeing a little” with four of the seven statements and “agreeing a little” with the other three, on average. All other students reported **Moderate Clarity of Instruction** in their science lessons. At the eighth grade, a comparable approach was used for biology, chemistry, physics, and earth science in countries where these were taught as separate subjects.



SOURCE: IEA's Trends in International Science and Science Study - TIMSS 2023
Downloaded from <https://timss2023.org/results>

Exhibit 5.3.2: Instructional Clarity in Science Lessons

Country	High Clarity of Instruction		Moderate Clarity of Instruction		Low Clarity of Instruction		Average Scale Score
	Percent of Students	Average Achievement	Percent of Students	Average Achievement	Percent of Students	Average Achievement	
Albania	91 (1.1)	501 (4.5)	8 (1.0)	457 (9.5)	1 ~	~ ~	11.2 (0.04)
Armenia	86 (0.9)	466 (2.3)	12 (0.8)	439 (5.3)	2 ~	~ ~	11.0 (0.04)
Australia	64 (1.2)	554 (2.9)	30 (1.1)	556 (3.4)	7 (0.5)	546 (5.4)	9.8 (0.05)
Azerbaijan	77 (0.8)	439 (3.3)	18 (0.8)	396 (4.7)	4 (0.4)	371 (7.7)	10.5 (0.04)
Bahrain	78 (1.0)	489 (4.0)	18 (0.9)	454 (7.2)	4 (0.3)	416 (7.6)	10.5 (0.05)
Belgium (Flemish)	65 (1.2)	494 (2.6)	31 (1.0)	489 (3.3)	4 (0.5)	462 (9.1)	9.9 (0.05)
Belgium (French)	59 (1.1)	486 (3.0)	35 (0.9)	480 (3.3)	7 (0.6)	472 (6.1)	9.6 (0.05)
Bosnia & Herzegovina	71 (1.0)	459 (4.4)	26 (1.0)	451 (4.4)	3 (0.4)	442 (9.3)	10.3 (0.04)
Brazil	68 (0.9)	454 (4.0)	26 (0.8)	421 (5.3)	6 (0.3)	369 (5.4)	9.9 (0.03)
Bulgaria	82 (1.3)	533 (5.0)	16 (1.2)	522 (9.1)	2 ~	~ ~	10.6 (0.06)
Canada	71 (0.8)	531 (2.1)	25 (0.7)	515 (3.1)	4 (0.3)	490 (6.5)	10.2 (0.03)
Chile	68 (1.0)	489 (2.5)	27 (1.0)	477 (3.9)	5 (0.4)	433 (9.9)	10.1 (0.05)
Chinese Taipei	58 (1.2)	578 (1.9)	33 (0.9)	572 (2.7)	10 (0.7)	556 (4.7)	9.5 (0.06)
Cyprus	62 (1.3)	495 (3.5)	27 (0.8)	482 (4.1)	11 (1.0)	483 (4.7)	9.6 (0.07)
Czech Republic	62 (1.1)	529 (2.7)	32 (0.9)	527 (2.7)	6 (0.5)	518 (4.5)	9.7 (0.05)
Denmark	44 (1.4)	531 (3.1)	43 (1.0)	522 (3.1)	14 (1.0)	515 (4.0)	8.9 (0.07)
England	69 (1.0)	563 (3.4)	26 (0.8)	559 (3.3)	5 (0.5)	534 (9.2)	10.0 (0.04)
Finland	62 (1.1)	551 (2.7)	32 (1.0)	541 (3.8)	6 (0.4)	523 (8.0)	9.7 (0.04)
France	54 (1.3)	496 (3.4)	39 (1.2)	488 (3.4)	7 (0.6)	470 (6.8)	9.4 (0.06)
Georgia	84 (0.9)	477 (3.2)	14 (0.8)	436 (5.0)	2 ~	~ ~	10.9 (0.05)
Germany	60 (1.1)	527 (3.1)	33 (0.9)	515 (3.7)	7 (0.6)	479 (7.7)	9.6 (0.05)
Hong Kong SAR	59 (1.0)	556 (4.5)	31 (0.9)	533 (4.6)	10 (0.8)	528 (6.1)	9.6 (0.05)
Hungary	66 (1.1)	532 (3.5)	28 (0.9)	520 (4.2)	7 (0.5)	507 (8.2)	9.9 (0.05)
Iran, Islamic Rep. of	87 (0.7)	442 (4.3)	11 (0.7)	402 (8.6)	2 ~	~ ~	10.9 (0.04)
Ireland	64 (1.4)	530 (3.3)	31 (1.2)	537 (4.4)	5 (0.5)	537 (8.6)	9.8 (0.06)
Italy	64 (1.1)	517 (2.6)	31 (0.9)	506 (3.3)	5 (0.5)	495 (7.3)	9.8 (0.05)
Japan	50 (1.6)	559 (2.4)	42 (1.3)	555 (3.2)	7 (0.8)	552 (5.4)	9.4 (0.08)
Jordan	76 (1.6)	436 (5.4)	18 (1.2)	392 (6.1)	6 (0.6)	347 (9.3)	10.5 (0.08)
Kazakhstan	60 (1.2)	488 (3.8)	36 (1.1)	448 (3.4)	4 (0.3)	423 (8.9)	9.7 (0.05)
Korea, Rep. of	69 (1.3)	589 (2.6)	26 (1.0)	572 (4.2)	5 (0.6)	572 (6.9)	10.0 (0.06)
Kosovo	86 (1.0)	413 (3.4)	12 (0.9)	366 (8.3)	2 ~	~ ~	11.0 (0.05)
Kuwait	74 (1.3)	397 (5.5)	22 (1.1)	360 (8.0)	4 (0.4)	330 (13.0)	10.3 (0.06)
Latvia	49 (1.6)	528 (3.3)	41 (1.3)	527 (3.5)	9 (0.9)	530 (6.2)	9.2 (0.06)
Lithuania	64 (1.1)	547 (2.9)	31 (1.0)	528 (3.6)	6 (0.5)	519 (7.2)	9.8 (0.04)
Macao SAR	55 (0.6)	546 (1.9)	36 (0.6)	526 (1.7)	9 (0.4)	512 (4.3)	9.4 (0.02)
Montenegro	75 (0.8)	474 (2.2)	22 (0.8)	444 (3.8)	4 (0.3)	411 (8.2)	10.3 (0.03)
Morocco	81 (1.2)	407 (5.8)	16 (1.1)	332 (6.2)	2 ~	~ ~	10.6 (0.06)
Netherlands	66 (1.2)	522 (2.8)	29 (1.1)	516 (4.0)	5 (0.5)	489 (8.2)	9.9 (0.05)
New Zealand	58 (1.1)	521 (3.4)	33 (1.0)	525 (2.8)	9 (0.6)	520 (6.0)	9.4 (0.05)
North Macedonia	85 (0.9)	456 (4.0)	12 (0.8)	410 (5.8)	3 (0.3)	385 (10.1)	10.9 (0.04)
Norway (5)	61 (1.1)	534 (2.6)	34 (1.0)	532 (3.2)	5 (0.5)	523 (6.6)	9.7 (0.04)
Oman	70 (0.9)	457 (4.6)	23 (0.7)	409 (4.9)	6 (0.4)	374 (6.0)	10.1 (0.04)
Poland	44 (1.3)	549 (3.2)	44 (1.0)	555 (2.5)	12 (0.9)	545 (3.3)	8.9 (0.06)
Portugal	76 (0.9)	516 (2.4)	21 (0.8)	503 (3.7)	3 (0.3)	484 (10.2)	10.3 (0.04)
Qatar	73 (0.8)	493 (3.3)	20 (0.6)	452 (5.4)	7 (0.5)	407 (8.8)	10.2 (0.04)
Romania	85 (1.3)	535 (4.2)	13 (1.1)	528 (9.4)	2 ~	~ ~	10.9 (0.05)
Saudi Arabia	74 (1.0)	456 (3.9)	19 (0.8)	404 (6.1)	7 (0.5)	373 (6.5)	10.3 (0.05)
Serbia	81 (1.0)	517 (3.0)	17 (0.9)	492 (4.5)	3 (0.3)	483 (10.3)	10.6 (0.05)
Singapore	64 (0.9)	616 (2.7)	29 (0.7)	596 (3.6)	7 (0.4)	589 (5.9)	9.8 (0.04)
Slovak Republic	67 (1.4)	519 (4.1)	28 (1.1)	532 (3.8)	5 (0.5)	518 (9.3)	9.9 (0.06)
Slovenia	60 (1.1)	531 (2.6)	36 (1.0)	527 (2.8)	4 (0.3)	503 (7.5)	9.7 (0.04)
South Africa (5)	61 (1.3)	332 (5.9)	31 (1.0)	272 (6.4)	8 (0.6)	253 (18.2)	9.6 (0.06)
Spain	75 (1.0)	510 (2.0)	20 (0.8)	494 (3.3)	4 (0.4)	495 (6.6)	10.3 (0.04)
Sweden	55 (1.5)	535 (3.8)	39 (1.2)	538 (3.1)	6 (0.5)	514 (9.3)	9.5 (0.06)
Türkiye (5)	78 (1.1)	578 (3.1)	18 (0.8)	545 (5.9)	4 (0.5)	542 (10.8)	10.3 (0.05)
United Arab Emirates	76 (0.4)	518 (1.8)	19 (0.3)	459 (2.9)	5 (0.2)	410 (5.5)	10.4 (0.02)
United States	68 (0.8)	549 (2.8)	26 (0.7)	523 (4.0)	6 (0.3)	487 (6.8)	10.0 (0.04)
Uzbekistan	80 (1.1)	428 (3.6)	16 (0.9)	371 (4.3)	4 (0.4)	333 (7.7)	10.7 (0.06)
International Average	68 (0.1)	505 (0.5)	26 (0.1)	483 (0.6)	6 (0.1)	471 (1.1)	
Benchmarking Participants							
Ontario, Canada	72 (1.4)	535 (3.0)	24 (1.2)	523 (4.7)	4 (0.5)	490 (10.9)	10.2 (0.06)
Quebec, Canada	67 (1.4)	513 (2.6)	29 (1.2)	504 (4.3)	4 (0.4)	487 (9.4)	10.0 (0.05)
Abu Dhabi, UAE	69 (0.9)	478 (2.6)	23 (0.7)	408 (3.8)	7 (0.4)	367 (7.1)	10.0 (0.04)
Dubai, UAE	79 (0.6)	574 (2.1)	18 (0.6)	541 (3.6)	3 (0.2)	507 (7.2)	10.5 (0.03)
Sharjah, UAE	81 (1.1)	520 (3.5)	15 (0.9)	465 (6.3)	4 (0.4)	431 (10.7)	10.7 (0.05)

This TIMSS context questionnaire scale was established in 2023 based on the combined response distribution of countries that participated in TIMSS 2023. To provide a point of reference for country comparisons, the scale centerpoint of 10 was located at the mean of the combined distribution. The units of the scale were chosen so that 2 scale score points corresponded to the standard deviation of the distribution.

() Standard errors appear in parentheses. Because of rounding some results may appear inconsistent.

An "r" indicates data are available for at least 70% but less than 85% of the students.

A tilde (~) indicates insufficient data to report result.

SOURCE: IEA's Trends in International Mathematics and Science Study - TIMSS 2023
Downloaded from <https://timss2023.org/results>



TIMSS & PIRLS
BOSTON COLLEGE

Exhibit 5.3.3: Instructional Clarity in Science Lessons

The general/integrated science panel summarizes responses for countries where students are enrolled in science as a single subject. The following panels for biology, chemistry, physics, and earth science summarize responses for countries where students are taught science as separate subjects.

Exhibit 5.3.3.a: Instructional Clarity in General/Integrated Science Lessons

Country	High Clarity of Instruction		Moderate Clarity of Instruction		Low Clarity of Instruction		Average Scale Score
	Percent of Students	Average Achievement	Percent of Students	Average Achievement	Percent of Students	Average Achievement	
Australia	38 (1.1)	541 (4.1)	41 (0.9)	525 (3.3)	21 (1.1)	501 (4.8)	9.5 (0.06)
Bahrain	61 (1.3)	473 (2.8)	26 (1.0)	449 (3.9)	13 (0.6)	419 (5.9)	10.4 (0.05)
Brazil	57 (0.9)	431 (2.7)	32 (0.7)	423 (3.1)	11 (0.7)	424 (6.6)	10.2 (0.04)
Chile	43 (1.6)	464 (3.2)	44 (1.1)	458 (3.0)	13 (1.1)	453 (5.2)	9.8 (0.07)
Chinese Taipei	37 (1.4)	586 (3.3)	46 (1.1)	567 (2.8)	18 (1.3)	559 (5.0)	9.5 (0.07)
England	35 (1.2)	552 (5.4)	46 (1.1)	538 (4.6)	19 (1.0)	510 (5.9)	9.4 (0.05)
Hong Kong SAR	42 (1.5)	548 (5.2)	45 (1.1)	524 (5.3)	13 (0.8)	491 (7.3)	9.8 (0.06)
Iran, Islamic Rep. of	61 (1.2)	427 (3.8)	31 (0.8)	410 (4.3)	9 (0.7)	406 (5.5)	10.4 (0.05)
Ireland	44 (2.2)	538 (5.4)	36 (1.3)	538 (4.5)	20 (1.5)	520 (4.5)	9.7 (0.10)
Israel	40 (1.5)	490 (4.7)	34 (0.8)	483 (4.5)	26 (1.6)	481 (5.1)	9.4 (0.09)
Italy	38 (1.7)	506 (3.5)	43 (1.2)	504 (3.4)	19 (1.4)	494 (5.4)	9.5 (0.08)
Japan	28 (1.4)	567 (3.9)	55 (1.1)	558 (3.1)	17 (1.2)	541 (6.9)	9.3 (0.07)
Jordan	68 (1.2)	432 (3.9)	23 (0.9)	397 (4.8)	8 (0.6)	385 (6.1)	10.8 (0.05)
Korea, Rep. of	50 (1.3)	558 (2.9)	39 (1.0)	537 (3.1)	11 (0.9)	521 (5.9)	10.1 (0.06)
Kuwait	68 (1.6)	435 (6.0)	22 (1.0)	413 (7.5)	9 (1.0)	397 (10.1)	10.6 (0.07)
Malaysia	53 (1.1)	445 (3.8)	40 (0.9)	414 (3.8)	7 (0.5)	371 (9.2)	10.3 (0.04)
Norway (9)	37 (1.2)	512 (3.3)	44 (0.9)	497 (2.7)	20 (1.0)	467 (3.9)	9.5 (0.05)
Oman	61 (1.0)	482 (2.7)	29 (0.7)	440 (3.6)	10 (0.5)	422 (6.1)	10.4 (0.04)
Palestinian Nat'l Auth.	63 (1.1)	418 (2.9)	25 (0.7)	378 (3.3)	12 (0.8)	364 (6.7)	10.5 (0.05)
Qatar	58 (2.0)	495 (4.5)	28 (1.4)	488 (5.9)	14 (1.1)	456 (6.6)	10.3 (0.09)
Saudi Arabia	71 (1.1)	437 (3.5)	21 (0.8)	414 (5.2)	8 (0.5)	404 (6.9)	10.9 (0.05)
Singapore	54 (1.2)	623 (5.5)	38 (1.0)	587 (6.4)	8 (0.8)	590 (14.0)	10.3 (0.05)
South Africa (9)	52 (1.3)	364 (4.2)	36 (0.8)	354 (5.1)	12 (0.7)	375 (6.2)	10.0 (0.05)
Türkiye	68 (1.3)	541 (3.5)	23 (0.8)	510 (4.9)	9 (0.9)	504 (8.8)	10.7 (0.06)
United Arab Emirates	62 (0.7)	507 (2.4)	27 (0.4)	487 (2.4)	11 (0.4)	450 (4.1)	10.5 (0.03)
United States	47 (1.3)	531 (4.3)	36 (0.8)	510 (4.3)	17 (1.1)	502 (4.7)	9.9 (0.07)
International Average	51 (0.3)	496 (0.8)	35 (0.2)	477 (0.9)	14 (0.2)	462 (1.3)	
Benchmarking Participants							
Abu Dhabi, UAE	57 (1.1)	478 (4.3)	30 (0.6)	441 (3.6)	14 (0.9)	404 (5.2)	10.2 (0.05)
Dubai, UAE	58 (1.2)	563 (3.4)	32 (0.8)	544 (3.9)	10 (0.7)	515 (6.0)	10.4 (0.05)
Sharjah, UAE	70 (1.8)	510 (5.8)	22 (1.1)	492 (6.3)	8 (0.8)	470 (9.7)	10.8 (0.08)

Separate Science Results

Exhibit 5.3.3b: Instructional Clarity in Biology Lessons

Country	High Clarity of Instruction		Moderate Clarity of Instruction		Low Clarity of Instruction		Average Scale Score
	Percent of Students	Average Achievement	Percent of Students	Average Achievement	Percent of Students	Average Achievement	
Austria	35 (1.2)	515 (3.9)	44 (1.1)	516 (2.5)	21 (1.5)	506 (5.1)	9.4 (0.07)
Azerbaijan	65 (1.3)	428 (3.2)	25 (1.1)	409 (4.8)	10 (0.7)	403 (5.2)	10.7 (0.05)
Cote d'Ivoire	60 (1.6)	175 (6.6)	35 (1.3)	172 (8.2)	5 (0.6)	182 (17.1)	10.4 (0.06)
Cyprus	43 (1.3)	489 (4.3)	34 (1.0)	464 (3.2)	23 (1.3)	451 (4.8)	9.6 (0.07)
Czech Republic	39 (1.5)	532 (2.8)	45 (1.1)	529 (2.3)	16 (1.1)	529 (4.4)	9.7 (0.06)
Finland	36 (1.0)	552 (3.4)	46 (0.9)	539 (4.0)	17 (0.9)	524 (5.0)	9.6 (0.05)
France	30 (1.5)	492 (4.0)	50 (1.1)	494 (3.7)	20 (1.5)	492 (4.3)	9.3 (0.07)
Georgia	73 (1.2)	462 (2.8)	21 (1.0)	442 (4.2)	5 (0.5)	443 (6.1)	11.1 (0.05)
Hungary	40 (1.6)	528 (4.0)	41 (1.0)	516 (4.0)	19 (1.4)	529 (4.7)	9.6 (0.08)
Kazakhstan	45 (1.4)	465 (3.6)	47 (1.2)	431 (3.4)	8 (0.6)	446 (7.0)	10.1 (0.05)
Lithuania	37 (1.5)	523 (3.8)	41 (1.0)	518 (3.6)	22 (1.4)	530 (4.2)	9.5 (0.08)
Morocco	59 (1.2)	333 (3.9)	30 (0.7)	321 (3.7)	11 (0.8)	328 (6.0)	10.4 (0.05)
Portugal	48 (1.7)	511 (2.9)	39 (1.1)	504 (3.0)	13 (1.1)	508 (4.6)	10.0 (0.07)
Romania	59 (1.6)	477 (4.2)	29 (1.1)	467 (5.0)	12 (1.1)	480 (7.5)	10.4 (0.07)
Sweden	33 (1.4)	544 (4.3)	44 (1.0)	532 (4.0)	23 (1.3)	520 (4.7)	9.4 (0.07)
Uzbekistan	77 (1.2)	405 (4.1)	19 (1.0)	384 (4.2)	4 (0.4)	382 (9.4)	11.2 (0.04)
International Average	49 (0.3)	464 (1.0)	37 (0.3)	452 (1.0)	14 (0.3)	453 (1.7)	
Malta	y	--	--	--	--	--	--

This TIMSS context questionnaire scale was established in 2023 based on the combined response distribution of countries that participated in TIMSS 2023. To provide a point of reference for country comparisons, the scale centerpoint of 10 was located at the mean of the combined distribution. The units of the scale were chosen so that 2 scale score points corresponded to the standard deviation of the distribution. The separate scales for biology, chemistry, physics, and earth science were each established in 2023 using a comparable approach.

() Standard errors appear in parentheses. Because of rounding some results may appear inconsistent.

An "r" indicates data are available for at least 70% but less than 85% of the students.

A "y" indicates data are available for less than 40% of the students.

A dash (-) indicates comparable data not available.

Exhibit 5.3.3: Instructional Clarity in Science Lessons

Separate Science Results

(Continued)

Exhibit 5.3.3c: Instructional Clarity in Chemistry Lessons

Chemistry		High Clarity of Instruction		Moderate Clarity of Instruction		Low Clarity of Instruction		Average Scale Score
Country		Percent of Students	Average Achievement	Percent of Students	Average Achievement	Percent of Students	Average Achievement	
Austria		34 (1.3)	522 (3.7)	40 (1.1)	514 (2.8)	25 (1.5)	507 (5.1)	9.5 (0.07)
Azerbaijan	r	59 (1.4)	428 (3.1)	28 (1.1)	406 (4.5)	13 (0.9)	417 (5.4)	10.5 (0.06)
Cote d'Ivoire		60 (1.3)	184 (8.3)	34 (1.1)	182 (8.8)	6 (0.6)	186 (16.5)	10.6 (0.05)
Cyprus	r	48 (1.1)	489 (3.8)	33 (1.0)	467 (3.9)	20 (1.0)	448 (4.6)	10.0 (0.05)
Czech Republic		35 (1.4)	531 (2.7)	44 (0.9)	530 (2.1)	20 (1.4)	528 (4.0)	9.7 (0.07)
Finland	r	34 (1.1)	562 (3.6)	43 (0.9)	539 (3.5)	23 (1.1)	521 (4.2)	9.6 (0.06)
France		28 (1.6)	503 (4.7)	47 (1.4)	494 (3.4)	26 (1.8)	485 (4.8)	9.3 (0.09)
Georgia		69 (1.3)	461 (2.7)	23 (1.1)	451 (4.1)	8 (0.7)	433 (8.0)	10.9 (0.05)
Hungary		36 (1.5)	533 (3.5)	41 (1.1)	522 (3.6)	24 (1.7)	513 (5.0)	9.6 (0.08)
Kazakhstan		40 (1.2)	473 (3.6)	50 (1.1)	434 (3.4)	10 (0.7)	446 (5.6)	10.1 (0.04)
Lithuania		39 (1.5)	531 (3.7)	40 (1.0)	519 (3.3)	21 (1.2)	513 (4.1)	9.7 (0.07)
Morocco	r	59 (1.1)	337 (3.6)	30 (0.8)	317 (3.9)	11 (0.7)	320 (5.2)	10.5 (0.05)
Portugal		44 (1.5)	515 (3.0)	39 (0.9)	505 (2.4)	17 (1.3)	497 (3.9)	10.0 (0.07)
Romania	r	51 (1.7)	477 (4.0)	31 (1.1)	471 (4.9)	18 (1.5)	479 (5.9)	10.1 (0.09)
Sweden	s	33 (1.4)	547 (4.7)	44 (1.2)	535 (4.3)	23 (1.4)	519 (4.7)	9.6 (0.07)
Uzbekistan		73 (1.0)	403 (4.1)	22 (0.9)	390 (4.8)	5 (0.4)	398 (7.1)	11.1 (0.04)
International Average		46 (0.3)	468 (1.0)	37 (0.3)	455 (1.1)	17 (0.3)	451 (1.6)	
Malta	y	--	--	--	--	--	--	--

Exhibit 5.3.3d: Instructional Clarity in Physics Lessons

Physics		High Clarity of Instruction		Moderate Clarity of Instruction		Low Clarity of Instruction		Average Scale Score
Country		Percent of Students	Average Achievement	Percent of Students	Average Achievement	Percent of Students	Average Achievement	
Austria		31 (1.6)	518 (4.3)	40 (1.2)	517 (3.1)	30 (1.9)	511 (4.7)	9.3 (0.09)
Azerbaijan	r	61 (1.3)	430 (3.3)	28 (0.9)	403 (4.3)	12 (0.8)	410 (5.9)	10.6 (0.06)
Cote d'Ivoire		60 (1.4)	185 (8.1)	34 (1.1)	180 (8.6)	6 (0.6)	195 (19.2)	10.7 (0.04)
Cyprus	r	45 (1.2)	490 (4.0)	32 (0.8)	465 (4.1)	23 (1.0)	451 (3.6)	9.8 (0.06)
Czech Republic		34 (1.3)	535 (2.8)	44 (1.0)	530 (2.3)	23 (1.4)	522 (3.8)	9.6 (0.07)
Finland	r	33 (1.3)	560 (4.1)	42 (0.9)	544 (3.7)	24 (1.3)	524 (4.6)	9.6 (0.07)
France		28 (1.6)	503 (4.7)	47 (1.4)	494 (3.4)	26 (1.8)	485 (4.8)	9.3 (0.08)
Georgia	r	65 (1.4)	463 (3.2)	25 (1.0)	445 (3.8)	10 (0.8)	440 (6.0)	10.8 (0.06)
Hungary		34 (1.4)	535 (4.3)	39 (0.9)	516 (3.8)	27 (1.8)	520 (4.4)	9.5 (0.09)
Kazakhstan		41 (1.3)	471 (4.1)	49 (1.2)	437 (2.7)	10 (0.7)	438 (7.0)	10.1 (0.05)
Lithuania		35 (1.3)	535 (4.2)	39 (0.8)	515 (3.6)	25 (1.4)	516 (4.8)	9.6 (0.07)
Malta	r	53 (0.8)	530 (2.1)	30 (0.8)	502 (4.0)	17 (0.6)	479 (4.6)	10.2 (0.03)
Morocco	r	59 (1.1)	338 (3.7)	30 (0.8)	316 (3.5)	11 (0.7)	316 (5.2)	10.6 (0.04)
Portugal		44 (1.5)	515 (3.0)	39 (0.9)	505 (2.4)	17 (1.3)	497 (3.9)	10.0 (0.07)
Romania	r	55 (1.5)	480 (4.3)	29 (1.0)	471 (4.6)	16 (1.1)	469 (6.7)	10.3 (0.07)
Sweden	r	33 (1.6)	549 (5.1)	43 (1.3)	532 (4.0)	25 (1.4)	522 (4.6)	9.5 (0.07)
Uzbekistan		73 (1.1)	405 (3.8)	22 (0.9)	388 (5.1)	5 (0.6)	384 (7.9)	11.2 (0.04)
International Average		46 (0.3)	473 (1.0)	36 (0.2)	456 (1.0)	18 (0.3)	452 (1.7)	

Exhibit 5.3.3e: Instructional Clarity in Earth Science Lessons

Earth Science		High Clarity of Instruction		Moderate Clarity of Instruction		Low Clarity of Instruction		Average Scale Score
Country		Percent of Students	Average Achievement	Percent of Students	Average Achievement	Percent of Students	Average Achievement	
Austria		32 (1.2)	513 (4.0)	43 (1.1)	517 (2.9)	25 (1.6)	514 (4.9)	9.4 (0.07)
Azerbaijan	r	64 (1.4)	426 (3.3)	25 (0.9)	409 (3.9)	11 (0.8)	410 (4.8)	10.7 (0.06)
Cote d'Ivoire		61 (1.4)	184 (6.6)	35 (1.2)	183 (11.5)	4 (0.4)	193 (21.4)	10.6 (0.05)
Cyprus	r	36 (0.9)	480 (4.8)	34 (0.9)	468 (3.9)	31 (1.0)	454 (3.8)	9.3 (0.05)
Czech Republic		35 (1.4)	526 (3.0)	44 (0.9)	532 (2.4)	21 (1.3)	533 (3.5)	9.6 (0.07)
Finland		35 (1.1)	554 (3.5)	46 (0.8)	542 (3.5)	19 (0.9)	516 (5.0)	9.7 (0.05)
France		30 (1.5)	492 (4.0)	51 (1.1)	494 (3.7)	19 (1.5)	493 (4.3)	9.4 (0.07)
Georgia		67 (1.4)	459 (3.2)	24 (0.9)	448 (3.8)	9 (0.9)	445 (5.7)	10.9 (0.06)
Hungary		39 (1.4)	531 (3.9)	41 (0.9)	516 (3.8)	20 (1.4)	525 (4.7)	9.7 (0.07)
Kazakhstan		42 (1.5)	470 (4.0)	48 (1.3)	433 (3.4)	10 (0.7)	446 (6.0)	10.1 (0.05)
Lithuania		41 (1.3)	525 (3.4)	41 (0.9)	518 (3.7)	18 (1.3)	526 (4.6)	9.8 (0.06)
Morocco	r	57 (1.2)	334 (3.9)	31 (0.8)	323 (3.7)	12 (0.7)	322 (5.5)	10.4 (0.05)
Portugal		48 (1.7)	511 (2.9)	39 (1.1)	504 (3.0)	13 (1.1)	508 (4.6)	10.1 (0.07)
Uzbekistan	r	71 (1.2)	403 (3.9)	24 (1.0)	390 (5.1)	5 (0.5)	388 (7.5)	11.1 (0.05)
International Average		47 (0.4)	458 (1.1)	37 (0.3)	448 (1.3)	15 (0.3)	448 (2.0)	
Malta	x	42 (1.3)	518 (4.4)	38 (1.2)	498 (4.4)	20 (1.0)	493 (5.8)	9.8 (0.05)
Romania	y	--	--	--	--	--	--	--
Sweden		--	--	--	--	--	--	--

This TIMSS context questionnaire scale was established in 2023 based on the combined response distribution of countries that participated in TIMSS 2023. To provide a point of reference for country comparisons, the scale centerpoint of 10 was located at the mean of the combined distribution. The units of the scale were chosen so that 2 scale score points corresponded to the standard deviation of the distribution. The separate scales for biology, chemistry, physics, and earth science were each established in 2023 using a comparable approach.

() Standard errors appear in parentheses. Because of rounding some results may appear inconsistent.

An "r" indicates data are available for at least 70% but less than 85% of the students. An "s" indicates data are available for at least 50% but less than 70% of the students.

An "x" indicates data are available for at least 40% but less than 50% of the students—interpret with caution. A "y" indicates data are available for less than 40% of the students.

A dash (-) indicates comparable data not available.

SOURCE: IEA's Trends in International Mathematics and Science Study - TIMSS 2023
Downloaded from <https://timss2023.org/results>



TIMSS & PIRLS
BOSTON COLLEGE

Disorderly Behavior During Science Lessons

Students' reports of disorderly behavior during science classes have a negative relationship with average science achievement: experiencing more frequent disruptive behavior is associated with lower average achievement. The TIMSS 2023 *Disorderly Behavior During Science Lessons* scale (Exhibit 5.3.4) includes items that asked students about the frequency of experiencing different types of disruptions during science lessons. In countries where eighth-grade science is taught as separate subjects, students provided answers for each science subject in which they were enrolled (biology, chemistry, physics, earth science). Based on their responses, students were assigned into one of three categories on the scale: experiencing disorderly behavior during “few or no lessons,” “some lessons,” or “most lessons.” Higher scale scores indicate less disruption than lower scale scores.

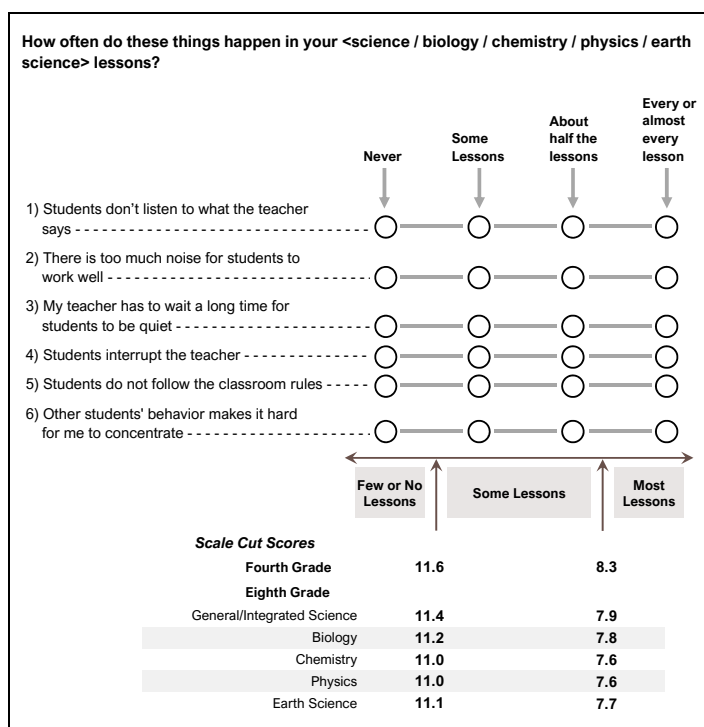
Internationally, 21 percent of fourth-grade students, on average, reported disorderly behavior in “few or no” science lessons, 59 percent reported disorderly behavior in “some” science lessons, and 20 percent reported disorderly behavior in “most” science lessons. There was a negative association between the frequency of disorderly behavior and average science achievement for fourth-grade students internationally. As shown in Exhibit 5.3.5, there was a 34-point difference in average science achievement between fourth-grade students who reported disorderly behavior in “few or no lessons” and those who reported disorderly behavior in “most lessons” (510 vs. 476), with average achievement for students who reported disorderly behavior in “some lessons” in between (497).

The distribution of eighth-grade students across the three scale categories is similar for students who took science as an integrated subject and students who were enrolled in separate science subjects. In integrated science, 28 percent of students on average reported disorderly behavior in “few or no” science lessons, 56 percent reported disorderly behavior in “some” science lessons, and 16 percent reported disorderly behavior in “most” science lessons. For biology, chemistry, physics, and earth science, these percentages ranged from 29 to 35 percent of students reporting disorderly behavior in “no lessons,” 52 to 58 percent of students reporting disorderly behavior in “some lessons,” and 13 to 14 percent of students reporting disorderly behavior in “most lessons,” on average. Internationally for eighth-grade students across all science subjects, there was a negative association between the frequency of disorderly behavior and average student science achievement (Exhibits 5.3.6a to 5.3.6e). Integrated science students who reported disorderly behavior in “few or no lessons” had an average science achievement 32 points higher than those who reported disorderly behavior in “most lessons” (494 vs. 462). Average science achievement for eighth-grade students who reported disorderly behavior in “some lessons” was 481. Results for the separate science subjects follow a similar pattern.

Exhibit 5.3.4: Disorderly Behavior During Science Lessons

About the Scale

Students were scored according to their responses to six statements on the *Disorderly Behavior During Science Lessons* scale. Cut scores divide the scale into three categories. Students who reported disorderly behavior in **Few or No Lessons** had a score at or above the cut score corresponding to reporting that three of the six situations “never” happened in their science lessons and the other three happened in “some lessons,” on average. Students who reported disorderly behavior in **Most Lessons** had a score at or below the cut score corresponding to reporting that three of the six situations happened in “every or almost every lesson” and the other three happened in “about half the lessons,” on average. All other students reported disorderly behavior in **Some Lessons**. At the eighth grade, a comparable approach was used for biology, chemistry, physics, and earth science in countries where these were taught as separate subjects.



SOURCE: IEA's Trends in International Mathematics and Science Study - TIMSS 2023
Downloaded from <https://timss2023.org/results>

Exhibit 5.3.5: Disorderly Behavior During Science Lessons

Country	Few or No Lessons		Some Lessons		Most Lessons		Average Scale Score
	Percent of Students	Average Achievement	Percent of Students	Average Achievement	Percent of Students	Average Achievement	
Albania	47 (2.4)	505 (4.9)	38 (1.8)	496 (5.8)	15 (1.5)	469 (7.1)	11.2 (0.13)
Armenia	42 (1.8)	470 (3.0)	43 (1.3)	461 (3.1)	15 (0.9)	438 (3.5)	10.9 (0.09)
Australia	9 (0.7)	574 (5.8)	70 (1.0)	558 (2.6)	22 (1.1)	528 (4.4)	9.5 (0.05)
Azerbaijan	29 (1.4)	441 (4.2)	53 (1.1)	427 (3.3)	19 (0.9)	408 (5.2)	10.3 (0.07)
Bahrain	28 (1.6)	505 (5.2)	49 (1.2)	479 (5.0)	23 (1.2)	450 (4.6)	10.1 (0.09)
Belgium (Flemish)	10 (0.7)	510 (5.0)	76 (0.9)	493 (2.5)	14 (0.9)	466 (4.8)	9.8 (0.05)
Belgium (French)	11 (0.7)	501 (5.2)	67 (1.0)	487 (3.0)	21 (1.0)	461 (3.6)	9.5 (0.05)
Bosnia & Herzegovina	18 (1.8)	465 (4.7)	54 (1.5)	461 (3.8)	29 (1.9)	435 (6.1)	9.5 (0.11)
Brazil	7 (0.6)	444 (8.3)	58 (0.9)	442 (3.9)	36 (1.1)	434 (4.8)	9.0 (0.04)
Bulgaria	48 (2.5)	546 (6.2)	45 (2.0)	526 (7.0)	7 (0.8)	457 (13.1)	11.3 (0.11)
Canada	12 (0.5)	540 (3.7)	68 (0.8)	527 (2.3)	20 (0.9)	509 (2.9)	9.7 (0.04)
Chile	10 (0.8)	495 (5.3)	58 (1.0)	491 (3.1)	33 (1.1)	466 (3.0)	9.1 (0.06)
Chinese Taipei	21 (1.2)	565 (3.8)	57 (1.1)	576 (2.2)	22 (1.2)	576 (2.7)	9.9 (0.07)
Cyprus	13 (1.0)	504 (5.5)	62 (1.4)	492 (3.0)	26 (1.3)	478 (4.3)	9.5 (0.06)
Czech Republic	13 (0.9)	537 (4.0)	64 (1.1)	532 (2.6)	23 (1.2)	508 (3.5)	9.6 (0.06)
Denmark	12 (0.9)	538 (4.6)	78 (0.8)	524 (2.8)	10 (0.7)	513 (4.6)	10.0 (0.05)
England	13 (1.1)	578 (6.3)	68 (1.1)	563 (3.1)	19 (1.2)	539 (4.9)	9.7 (0.07)
Finland	21 (1.2)	558 (3.3)	70 (1.0)	546 (2.9)	9 (0.6)	514 (7.0)	10.4 (0.05)
France	15 (1.0)	508 (4.6)	65 (1.2)	494 (3.5)	20 (1.1)	471 (4.7)	9.8 (0.05)
Georgia	25 (1.5)	482 (4.8)	57 (1.4)	471 (3.3)	18 (1.0)	446 (5.5)	10.1 (0.07)
Germany	11 (0.8)	530 (5.8)	73 (1.0)	523 (3.0)	16 (0.9)	496 (5.2)	9.7 (0.05)
Hong Kong SAR	31 (1.3)	547 (3.8)	54 (1.0)	548 (4.8)	15 (1.2)	536 (6.8)	10.6 (0.08)
Hungary	22 (1.3)	545 (4.4)	61 (1.1)	529 (3.2)	17 (1.1)	497 (6.1)	10.1 (0.06)
Iran, Islamic Rep. of	20 (1.2)	444 (6.3)	54 (1.1)	440 (5.1)	27 (1.3)	424 (5.5)	9.7 (0.08)
Ireland	19 (1.3)	546 (4.3)	67 (1.3)	536 (3.4)	14 (1.3)	499 (6.0)	10.1 (0.07)
Italy	15 (1.0)	518 (5.7)	68 (1.1)	514 (2.6)	17 (1.0)	502 (4.1)	9.8 (0.05)
Japan	51 (1.7)	561 (2.7)	43 (1.5)	556 (3.0)	6 (0.5)	522 (7.8)	11.4 (0.07)
Jordan	31 (2.5)	447 (7.7)	45 (1.8)	413 (5.8)	24 (1.5)	405 (5.2)	10.2 (0.13)
Kazakhstan	35 (1.3)	483 (4.3)	49 (1.1)	467 (3.9)	17 (0.8)	457 (4.7)	10.6 (0.06)
Korea, Rep. of	29 (1.7)	586 (2.9)	60 (1.4)	584 (2.6)	10 (1.0)	574 (6.5)	10.5 (0.07)
Kosovo	32 (1.5)	417 (4.9)	49 (1.4)	407 (3.7)	19 (1.0)	384 (4.9)	10.4 (0.07)
Kuwait	21 (1.5)	406 (7.5)	55 (1.3)	388 (6.2)	24 (1.2)	366 (8.0)	9.8 (0.08)
Latvia	13 (1.2)	539 (4.9)	64 (1.1)	532 (3.2)	23 (1.1)	506 (4.8)	9.6 (0.06)
Lithuania	18 (1.2)	557 (4.4)	65 (1.1)	541 (3.0)	17 (1.1)	514 (4.5)	10.0 (0.06)
Macao SAR	24 (0.5)	548 (2.5)	61 (0.6)	533 (1.6)	16 (0.4)	527 (3.6)	10.2 (0.02)
Montenegro	21 (0.9)	486 (3.1)	52 (0.9)	466 (2.5)	27 (1.0)	446 (3.2)	9.7 (0.05)
Morocco	27 (2.1)	433 (10.4)	57 (1.9)	382 (5.4)	16 (0.9)	361 (5.5)	10.3 (0.09)
Netherlands	13 (1.1)	523 (5.1)	76 (1.2)	521 (3.1)	11 (1.1)	496 (5.2)	10.0 (0.06)
New Zealand	9 (0.5)	546 (7.2)	64 (1.1)	527 (2.9)	27 (1.1)	500 (3.2)	9.4 (0.04)
North Macedonia	32 (1.4)	463 (4.5)	46 (1.2)	452 (4.7)	22 (1.1)	418 (4.9)	10.3 (0.08)
Norway (5)	12 (1.0)	539 (4.9)	75 (1.1)	535 (2.7)	13 (0.9)	519 (4.7)	10.0 (0.05)
Oman	20 (1.0)	471 (8.5)	53 (0.9)	433 (4.0)	27 (0.9)	425 (4.5)	9.7 (0.05)
Poland	19 (1.2)	555 (3.7)	65 (1.1)	554 (2.5)	16 (0.9)	533 (4.2)	10.0 (0.06)
Portugal	15 (1.1)	527 (3.9)	66 (1.1)	516 (2.6)	19 (1.2)	487 (3.9)	9.8 (0.06)
Qatar	24 (0.9)	485 (4.7)	53 (0.8)	479 (4.5)	23 (1.0)	464 (5.2)	10.0 (0.05)
Romania	25 (1.7)	540 (5.3)	55 (1.5)	534 (5.1)	20 (1.4)	520 (5.6)	10.1 (0.10)
Saudi Arabia	30 (1.3)	461 (5.5)	46 (1.1)	432 (4.8)	24 (1.0)	422 (4.1)	10.1 (0.07)
Serbia	23 (1.6)	519 (6.1)	56 (1.4)	515 (3.5)	21 (1.3)	494 (3.5)	10.1 (0.08)
Slovak Republic	17 (1.7)	521 (11.5)	63 (1.5)	526 (4.1)	19 (1.3)	512 (5.9)	9.9 (0.08)
Slovenia	14 (1.0)	546 (4.0)	66 (1.0)	533 (2.4)	19 (0.9)	502 (3.6)	9.7 (0.05)
South Africa (5)	11 (0.8)	321 (11.7)	65 (1.0)	299 (5.8)	25 (0.9)	323 (6.9)	9.4 (0.05)
Spain	7 (0.6)	520 (4.1)	68 (0.9)	509 (1.9)	25 (1.0)	496 (3.1)	9.3 (0.04)
Sweden	17 (1.3)	549 (4.9)	70 (1.2)	535 (2.7)	13 (1.3)	516 (8.4)	10.1 (0.08)
Türkiye (5)	18 (1.1)	583 (4.9)	62 (0.9)	569 (3.7)	20 (1.1)	562 (5.2)	9.8 (0.06)
United Arab Emirates	25 (0.6)	529 (2.5)	53 (0.5)	502 (1.9)	22 (0.5)	469 (3.3)	10.1 (0.03)
United States	14 (0.7)	554 (4.6)	63 (0.7)	543 (3.1)	23 (0.9)	513 (3.6)	9.6 (0.05)
Uzbekistan	39 (1.5)	439 (3.6)	42 (1.2)	404 (3.8)	19 (0.9)	387 (4.3)	10.7 (0.08)
International Average	21 (0.2)	510 (0.7)	59 (0.2)	497 (0.5)	20 (0.1)	476 (0.7)	
Singapore	--	--	--	--	--	--	--
Benchmarking Participants							
Ontario, Canada	10 (0.7)	537 (5.4)	68 (1.3)	533 (3.6)	23 (1.5)	520 (4.3)	9.5 (0.07)
Quebec, Canada	15 (1.1)	524 (4.5)	69 (1.0)	511 (3.0)	16 (1.2)	491 (4.5)	9.9 (0.06)
Abu Dhabi, UAE	18 (0.9)	492 (5.1)	56 (0.8)	455 (3.0)	26 (0.8)	428 (4.8)	9.6 (0.05)
Dubai, UAE	25 (1.0)	580 (2.8)	57 (1.0)	568 (2.0)	18 (0.8)	540 (4.1)	10.2 (0.05)
Sharjah, UAE	32 (1.9)	532 (4.8)	49 (1.1)	504 (3.6)	19 (1.3)	481 (6.9)	10.4 (0.10)

This TIMSS context questionnaire scale was established in 2023 based on the combined response distribution of countries that participated in TIMSS 2023. To provide a point of reference for country comparisons, the scale centerpoint of 10 was located at the mean of the combined distribution. The units of the scale were chosen so that 2 scale score points corresponded to the standard deviation of the distribution.

() Standard errors appear in parentheses. Because of rounding some results may appear inconsistent.

An "r" indicates data are available for at least 70% but less than 85% of the students.

A dash (-) indicates comparable data not available.

SOURCE: IEA's Trends in International Mathematics and Science Study - TIMSS 2023
Downloaded from <https://timss2023.org/results>



TIMSS & PIRLS
BOSTON COLLEGE

Exhibit 5.3.6: Disorderly Behavior During Science Lessons

The general/integrated science panel summarizes responses for countries where students are enrolled in science as a single subject. The following panels for biology, chemistry, physics, and earth science summarize responses for countries where students are taught science as separate subjects.

Exhibit 5.3.6a: Disorderly Behavior in General/Integrated Science Lessons

General/Integrated Science		Few or No Lessons		Some Lessons		Most Lessons		Average Scale Score
Country		Percent of Students	Average Achievement	Percent of Students	Average Achievement	Percent of Students	Average Achievement	
Australia		12 (0.7)	545 (5.8)	67 (0.9)	528 (3.1)	20 (1.0)	508 (3.9)	9.3 (0.05)
Bahrain		31 (1.1)	486 (3.7)	51 (0.9)	458 (3.2)	18 (1.0)	423 (5.3)	10.0 (0.06)
Brazil		10 (0.6)	439 (5.9)	59 (0.7)	433 (3.4)	31 (0.8)	415 (2.9)	8.9 (0.04)
Chile		11 (0.8)	469 (4.8)	67 (1.1)	462 (2.9)	22 (1.1)	450 (3.7)	9.2 (0.05)
Chinese Taipei		41 (1.7)	563 (3.5)	50 (1.3)	579 (3.0)	10 (1.0)	583 (5.2)	10.7 (0.08)
England		22 (1.1)	555 (5.9)	66 (1.0)	538 (4.5)	11 (0.8)	510 (7.7)	10.0 (0.05)
Hong Kong SAR		34 (1.7)	538 (5.3)	56 (1.4)	527 (5.2)	9 (0.9)	519 (8.2)	10.5 (0.07)
Iran, Islamic Rep. of		22 (1.0)	437 (5.0)	59 (0.9)	421 (4.0)	19 (0.7)	397 (4.5)	9.6 (0.05)
Ireland		38 (1.6)	540 (2.6)	53 (1.3)	534 (4.7)	9 (0.7)	512 (9.2)	10.5 (0.07)
Israel		20 (1.1)	488 (6.8)	59 (1.0)	487 (3.7)	21 (1.1)	479 (5.3)	9.6 (0.07)
Italy		25 (1.4)	505 (4.3)	64 (1.2)	503 (3.4)	11 (0.8)	496 (4.8)	10.1 (0.06)
Japan		64 (2.3)	561 (4.3)	33 (2.0)	556 (3.0)	3 (0.5)	533 (7.6)	11.5 (0.08)
Jordan		29 (1.2)	445 (4.6)	49 (1.0)	417 (3.9)	22 (0.8)	392 (5.7)	9.8 (0.06)
Korea, Rep. of		46 (1.4)	541 (2.8)	47 (1.2)	549 (3.1)	7 (0.7)	557 (6.2)	10.9 (0.06)
Kuwait		31 (1.3)	440 (6.1)	51 (1.1)	429 (6.2)	17 (1.1)	397 (9.0)	10.0 (0.07)
Malaysia		26 (1.0)	456 (4.1)	64 (0.8)	422 (3.6)	9 (0.5)	384 (5.8)	10.1 (0.05)
Norway (9)		22 (1.3)	503 (4.5)	68 (1.2)	497 (2.6)	10 (0.8)	477 (5.3)	10.1 (0.06)
Oman		23 (1.0)	490 (3.7)	58 (0.9)	460 (3.1)	19 (0.7)	443 (3.7)	9.6 (0.05)
Palestinian Nat'l Auth.		29 (1.0)	426 (3.7)	48 (0.9)	396 (3.9)	23 (0.8)	383 (3.5)	9.8 (0.05)
Qatar		30 (1.3)	501 (6.8)	51 (1.0)	489 (4.8)	19 (1.1)	460 (5.4)	9.9 (0.07)
Saudi Arabia		37 (1.2)	447 (4.0)	45 (1.0)	429 (3.8)	18 (0.8)	393 (4.9)	10.2 (0.06)
South Africa (9)		13 (0.7)	389 (6.7)	67 (0.8)	357 (4.2)	20 (0.9)	362 (5.7)	9.3 (0.05)
Türkiye		21 (1.2)	544 (5.4)	60 (1.0)	530 (4.0)	19 (1.1)	519 (5.3)	9.7 (0.07)
United Arab Emirates		33 (0.7)	516 (3.0)	48 (0.5)	498 (2.1)	18 (0.4)	450 (2.9)	10.1 (0.03)
United States		26 (1.3)	534 (4.6)	60 (1.0)	516 (4.2)	14 (0.8)	497 (4.2)	10.0 (0.06)
International Average		28 (0.2)	494 (1.0)	56 (0.2)	481 (0.8)	16 (0.2)	462 (1.1)	
Singapore		--	--	--	--	--	--	--
Benchmarking Participants								
Abu Dhabi, UAE		27 (1.2)	488 (5.1)	51 (0.9)	459 (3.5)	22 (0.8)	416 (4.5)	9.7 (0.05)
Dubai, UAE		32 (1.2)	572 (4.0)	54 (1.1)	550 (3.2)	14 (0.5)	514 (5.6)	10.2 (0.05)
Sharjah, UAE		40 (2.3)	516 (7.6)	43 (1.5)	505 (4.9)	17 (1.1)	467 (5.3)	10.4 (0.11)

Separate Science Results

Exhibit 5.3.6b: Disorderly Behavior in Biology Lessons

Biology		Few or No Lessons		Some Lessons		Most Lessons		Average Scale Score
Country		Percent of Students	Average Achievement	Percent of Students	Average Achievement	Percent of Students	Average Achievement	
Austria		29 (1.8)	523 (4.1)	58 (1.5)	510 (3.0)	12 (1.1)	510 (4.9)	10.0 (0.08)
Azerbaijan	r	33 (1.2)	432 (3.8)	51 (1.0)	416 (3.5)	17 (0.8)	410 (4.3)	10.0 (0.06)
Cote d'Ivoire		26 (1.5)	182 (9.6)	63 (1.2)	171 (6.8)	12 (0.7)	177 (8.3)	9.8 (0.07)
Cyprus		22 (1.0)	487 (4.2)	59 (0.9)	468 (3.6)	19 (0.8)	464 (4.1)	9.5 (0.05)
Czech Republic		26 (1.2)	541 (3.1)	63 (0.9)	528 (2.0)	11 (0.9)	515 (3.8)	9.9 (0.06)
Finland	r	29 (1.3)	554 (4.0)	63 (1.2)	537 (3.3)	8 (0.6)	523 (6.4)	10.2 (0.05)
France		33 (1.8)	502 (3.5)	55 (1.3)	493 (3.1)	12 (1.2)	471 (7.5)	10.1 (0.09)
Georgia		30 (1.3)	464 (4.2)	57 (1.2)	454 (3.0)	13 (0.9)	438 (4.8)	10.0 (0.06)
Hungary		31 (1.7)	531 (3.7)	59 (1.3)	521 (4.0)	11 (0.9)	510 (6.3)	10.1 (0.08)
Kazakhstan		43 (1.3)	456 (3.7)	48 (1.1)	442 (3.4)	9 (0.6)	431 (7.3)	10.6 (0.06)
Lithuania		28 (1.3)	529 (4.1)	59 (1.0)	520 (3.2)	13 (0.9)	515 (4.7)	9.9 (0.07)
Morocco		23 (1.0)	339 (5.3)	57 (0.9)	326 (3.5)	20 (0.8)	325 (4.3)	9.5 (0.05)
Portugal		16 (1.2)	520 (3.7)	67 (1.0)	506 (2.6)	17 (1.1)	503 (4.2)	9.4 (0.07)
Romania	r	32 (1.7)	484 (4.1)	51 (1.4)	477 (3.7)	17 (1.0)	451 (8.4)	10.0 (0.08)
Sweden	r	22 (1.2)	539 (5.9)	67 (1.1)	534 (3.1)	11 (0.8)	523 (6.2)	9.9 (0.06)
Uzbekistan		42 (1.5)	412 (5.0)	44 (1.2)	397 (3.7)	14 (0.9)	375 (5.9)	10.4 (0.07)
International Average		29 (0.3)	468 (1.2)	58 (0.3)	456 (0.9)	14 (0.2)	446 (1.5)	
Malta	y	--	--	--	--	--	--	--

This TIMSS context questionnaire scale was established in 2023 based on the combined response distribution of countries that participated in TIMSS 2023. To provide a point of reference for country comparisons, the scale centerpoint of 10 was located at the mean of the combined distribution. The units of the scale were chosen so that 2 scale score points corresponded to the standard deviation of the distribution. The separate scales for biology, chemistry, physics, and earth science were each established in 2023 using a comparable approach.

() Standard errors appear in parentheses. Because of rounding some results may appear inconsistent.

An "r" indicates data are available for at least 70% but less than 85% of the students.

A "y" indicates data are available for less than 40% of the students.

A dash (-) indicates comparable data not available.

Exhibit 5.3.6: Disorderly Behavior During Science Lessons

Separate Science Results

(Continued)

Exhibit 5.3.6c: Disorderly Behavior in Chemistry Lessons

Chemistry		Few or No Lessons		Some Lessons		Most Lessons		Average Scale Score
Country		Percent of Students	Average Achievement	Percent of Students	Average Achievement	Percent of Students	Average Achievement	
Austria		34 (1.8)	525 (3.3)	54 (1.6)	513 (2.7)	11 (1.0)	497 (8.0)	10.0 (0.08)
Azerbaijan	r	39 (1.4)	434 (3.8)	45 (1.2)	416 (3.8)	17 (0.8)	405 (4.4)	9.9 (0.07)
Cote d'Ivoire		29 (1.5)	198 (12.3)	59 (1.2)	178 (7.8)	13 (0.6)	178 (7.9)	9.7 (0.06)
Cyprus	r	35 (1.2)	481 (3.7)	51 (1.0)	473 (3.7)	15 (0.7)	455 (5.3)	9.9 (0.05)
Czech Republic		32 (1.4)	537 (2.9)	59 (1.1)	530 (2.2)	10 (0.8)	508 (3.5)	10.0 (0.06)
Finland	r	33 (1.5)	555 (4.0)	59 (1.3)	540 (2.9)	7 (0.5)	508 (6.7)	10.1 (0.06)
France		34 (1.8)	503 (3.6)	52 (1.4)	494 (3.6)	14 (1.3)	470 (6.3)	9.9 (0.09)
Georgia		38 (1.3)	466 (4.5)	50 (1.1)	452 (2.5)	12 (0.7)	436 (4.8)	10.1 (0.06)
Hungary		38 (2.0)	536 (3.6)	53 (1.6)	520 (3.8)	10 (0.9)	491 (5.9)	10.2 (0.08)
Kazakhstan		49 (1.4)	458 (3.7)	43 (1.3)	447 (3.5)	8 (0.5)	429 (6.1)	10.7 (0.06)
Lithuania		37 (1.6)	529 (3.6)	54 (1.4)	522 (3.3)	10 (0.7)	498 (6.6)	10.1 (0.07)
Morocco	r	28 (1.0)	341 (4.1)	51 (0.9)	325 (3.6)	20 (0.9)	321 (4.2)	9.5 (0.06)
Portugal		19 (1.3)	515 (3.7)	65 (1.2)	508 (2.3)	16 (1.1)	500 (4.8)	9.4 (0.06)
Romania	r	38 (2.0)	486 (4.0)	46 (1.8)	475 (4.2)	16 (1.2)	454 (7.0)	10.0 (0.08)
Sweden	s	26 (1.4)	541 (6.0)	64 (1.2)	535 (3.6)	10 (1.0)	524 (6.2)	9.8 (0.07)
Uzbekistan		45 (1.6)	414 (4.7)	40 (1.4)	396 (3.9)	15 (1.0)	369 (5.4)	10.3 (0.08)
International Average		35 (0.4)	470 (1.2)	53 (0.3)	458 (1.0)	13 (0.2)	440 (1.5)	
Malta	y	--	--	--	--	--	--	--

Exhibit 5.3.6d: Disorderly Behavior in Physics Lessons

Physics		Few or No Lessons		Some Lessons		Most Lessons		Average Scale Score
Country		Percent of Students	Average Achievement	Percent of Students	Average Achievement	Percent of Students	Average Achievement	
Austria		32 (1.9)	525 (3.3)	55 (1.4)	514 (2.9)	12 (1.1)	498 (7.6)	9.9 (0.08)
Azerbaijan	r	41 (1.5)	434 (3.8)	42 (1.3)	414 (3.8)	17 (0.9)	403 (4.9)	10.0 (0.07)
Cote d'Ivoire		29 (1.5)	198 (12.5)	58 (1.3)	180 (7.9)	12 (0.7)	175 (7.2)	9.7 (0.06)
Cyprus	r	30 (1.0)	483 (3.8)	54 (0.9)	472 (4.0)	16 (0.7)	458 (4.6)	9.7 (0.04)
Czech Republic		35 (1.5)	538 (2.8)	56 (1.2)	528 (2.3)	9 (0.7)	509 (4.3)	10.1 (0.06)
Finland	r	34 (1.4)	558 (3.9)	58 (1.2)	541 (3.4)	8 (0.5)	510 (8.2)	10.2 (0.06)
France		34 (1.8)	503 (3.6)	52 (1.4)	494 (3.6)	14 (1.3)	470 (6.2)	9.9 (0.09)
Georgia	r	37 (1.4)	464 (4.7)	50 (1.3)	454 (2.9)	13 (0.7)	437 (5.2)	10.1 (0.06)
Hungary		38 (1.9)	532 (4.1)	52 (1.5)	521 (3.8)	10 (0.9)	500 (6.7)	10.2 (0.08)
Kazakhstan		51 (1.4)	458 (3.8)	41 (1.1)	447 (3.5)	7 (0.5)	429 (6.1)	10.7 (0.06)
Lithuania		37 (1.5)	530 (3.8)	53 (1.2)	520 (3.2)	10 (0.8)	509 (7.3)	10.1 (0.07)
Malta	r	35 (0.8)	536 (2.9)	51 (0.9)	507 (2.9)	13 (0.6)	473 (5.7)	9.9 (0.03)
Morocco		28 (1.1)	341 (4.4)	50 (0.8)	324 (3.7)	21 (0.9)	322 (4.2)	9.5 (0.06)
Portugal		19 (1.3)	515 (3.7)	65 (1.2)	508 (2.3)	16 (1.1)	500 (4.8)	9.4 (0.06)
Romania	r	39 (2.0)	490 (3.8)	46 (1.7)	471 (4.8)	16 (1.2)	453 (6.7)	10.0 (0.09)
Sweden	r	24 (1.4)	545 (5.9)	66 (1.3)	533 (3.1)	10 (0.8)	526 (6.8)	9.8 (0.06)
Uzbekistan		46 (1.4)	414 (4.5)	39 (1.1)	396 (3.8)	15 (0.8)	369 (5.0)	10.3 (0.07)
International Average		35 (0.4)	474 (1.2)	52 (0.3)	460 (0.9)	13 (0.2)	444 (1.5)	

Exhibit 5.3.6e: Disorderly Behavior in Earth Science Lessons

Earth Science		Few or No Lessons		Some Lessons		Most Lessons		Average Scale Score
Country		Percent of Students	Average Achievement	Percent of Students	Average Achievement	Percent of Students	Average Achievement	
Austria		33 (1.8)	523 (3.5)	55 (1.5)	512 (3.0)	13 (1.3)	507 (6.1)	10.0 (0.09)
Azerbaijan	r	37 (1.3)	435 (4.1)	46 (1.1)	414 (3.5)	17 (0.8)	403 (4.7)	10.1 (0.06)
Cote d'Ivoire		28 (1.7)	201 (15.3)	60 (1.4)	177 (6.8)	12 (0.8)	181 (8.6)	9.8 (0.07)
Cyprus	r	22 (1.2)	470 (5.7)	55 (1.0)	466 (3.8)	23 (0.9)	469 (4.4)	9.4 (0.05)
Czech Republic		30 (1.4)	533 (2.8)	59 (1.1)	531 (2.1)	10 (0.8)	516 (4.5)	10.1 (0.06)
Finland	r	30 (1.3)	556 (3.4)	61 (1.2)	538 (3.3)	9 (0.5)	517 (6.5)	10.1 (0.05)
France		33 (1.8)	502 (3.5)	55 (1.3)	493 (3.1)	12 (1.2)	471 (7.5)	10.0 (0.09)
Georgia		33 (1.4)	464 (4.4)	53 (1.0)	455 (2.8)	14 (1.0)	435 (4.6)	10.1 (0.07)
Hungary		36 (1.8)	530 (3.8)	54 (1.3)	520 (3.7)	11 (1.0)	515 (7.9)	10.2 (0.08)
Kazakhstan		47 (1.4)	455 (3.9)	44 (1.1)	447 (3.5)	9 (0.7)	435 (6.6)	10.7 (0.06)
Lithuania		32 (1.4)	529 (4.2)	56 (1.1)	521 (3.2)	12 (0.8)	512 (5.7)	10.1 (0.07)
Morocco	r	26 (1.0)	341 (4.2)	54 (0.8)	326 (3.5)	20 (0.7)	323 (5.2)	9.6 (0.05)
Portugal		16 (1.2)	520 (3.7)	67 (1.0)	506 (2.6)	17 (1.1)	503 (4.2)	9.4 (0.07)
Uzbekistan	r	44 (1.5)	412 (4.9)	43 (1.3)	396 (3.8)	14 (0.9)	373 (4.9)	10.4 (0.07)
International Average		32 (0.4)	462 (1.5)	54 (0.3)	450 (1.0)	14 (0.2)	440 (1.6)	
Malta	x	26 (1.0)	536 (5.3)	55 (1.1)	501 (3.9)	19 (0.8)	473 (7.8)	9.7 (0.04)
Romania	y	--	--	--	--	--	--	--
Sweden		--	--	--	--	--	--	--

This TIMSS context questionnaire scale was established in 2023 based on the combined response distribution of countries that participated in TIMSS 2023. To provide a point of reference for country comparisons, the scale centerpoint of 10 was located at the mean of the combined distribution. The units of the scale were chosen so that 2 scale score points corresponded to the standard deviation of the distribution. The separate scales for biology, chemistry, physics, and earth science were each established in 2023 using a comparable approach.

() Standard errors appear in parentheses. Because of rounding some results may appear inconsistent.

An "r" indicates data are available for at least 70% but less than 85% of the students. An "s" indicates data are available for at least 50% but less than 70% of the students.

An "x" indicates data are available for at least 40% but less than 50% of the students—interpret with caution. A "y" indicates data are available for less than 40% of the students.

A dash (-) indicates comparable data not available.

SOURCE: IEA's Trends in International Mathematics and Science Study - TIMSS 2023
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TIMSS & PIRLS
BOSTON COLLEGE

Teachers Emphasize Science Inquiry – Teachers’ Reports (Grade 4)

The degree to which teachers emphasize different components of science inquiry in their teaching varies internationally. Science teachers were asked about the emphasis they place on various aspects of inquiry during science lessons. Fourth-grade teachers responded to five items about their emphasis on activities such as encouraging students to ask questions about scientific phenomena or having students predict the outcomes of experiments or investigations (Exhibit 5.3.7).

Exhibit 5.3.8 presents the percentages of fourth-grade students whose teachers reported placing “a lot” of emphasis on the science inquiry practices. On average and within many countries, the most frequently emphasized science inquiry practices in the fourth grade were “ask questions about scientific phenomena” and “predict the outcomes of scientific experiments or investigations,” with 77 percent and 70 percent, respectively, of students having teachers who reported that they emphasized these practices “a lot.” The least frequently emphasized practice was “create representations to explain scientific phenomena,” with only 39 percent of students, on average, having teachers who reported that they emphasized this practice “a lot.”

Science • Grade 4

Exhibit 5.3.7: Teachers Emphasize Science Inquiry – Teachers’ Reports

About the Items

Exhibit 5.3.8 reports the percentage of students whose teachers responded “a lot” to each of five items.

How much emphasis do you place on the following when teaching science to students in this class?

	A lot	Some	None
1) Encouraging students to ask questions about scientific phenomena -----	☐	☐	☐
2) Having students predict the outcomes of experiments or investigations -----	☐	☐	☐
3) Having students create representations (e.g., models, graphs) to explain scientific phenomena -----	☐	☐	☐
4) Having students use scientific concepts to explain phenomena -----	☐	☐	☐
5) Having students conduct experiments (hands-on or virtually) -----	☐	☐	☐

SOURCE: IEA's Trends in International Mathematics and Science Study - TIMSS 2023
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Exhibit 5.3.8: Teachers Emphasize Science Inquiry – Teachers' Reports

Country	Percent of Students Whose Teachers Place "A lot" of Emphasis on Science Inquiry Practices				
	Ask Questions about Scientific Phenomena	Predict the Outcomes of Experiments or Investigations	Create Representations to Explain Scientific Phenomena	Use Scientific Concepts to Explain Phenomena	Conduct Experiments
Albania	r 88 (3.8)	r 77 (5.2)	r 59 (6.2)	r 73 (5.5)	r 67 (5.7)
Armenia	91 (2.3)	52 (4.1)	44 (4.4)	58 (4.3)	42 (3.9)
Australia	s 72 (3.8)	s 81 (3.0)	s 36 (4.1)	s 45 (3.7)	s 54 (4.3)
Azerbaijan	r 82 (3.1)	r 64 (3.9)	r 57 (4.1)	r 67 (3.5)	r 43 (3.9)
Bahrain	94 (1.6)	87 (2.3)	55 (3.4)	77 (3.7)	65 (3.8)
Belgium (Flemish)	r 51 (3.5)	r 50 (4.3)	r 6 (2.2)	r 7 (1.7)	r 17 (2.8)
Belgium (French)	r 88 (2.4)	r 87 (2.4)	r 48 (3.2)	r 52 (3.6)	r 62 (2.8)
Bosnia & Herzegovina	r 92 (2.5)	r 73 (4.2)	r 26 (3.7)	r 43 (5.0)	r 26 (4.8)
Brazil	83 (2.4)	60 (3.0)	33 (3.8)	35 (3.4)	38 (3.0)
Bulgaria	89 (2.4)	59 (4.2)	58 (3.7)	63 (3.6)	35 (3.6)
Canada	83 (1.9)	75 (2.3)	29 (2.0)	48 (2.5)	45 (2.3)
Chile	83 (3.1)	72 (3.7)	65 (3.9)	60 (3.9)	57 (4.1)
Chinese Taipei	69 (3.3)	59 (3.5)	27 (3.3)	53 (3.9)	81 (2.8)
Cyprus	85 (2.6)	96 (1.6)	39 (3.7)	81 (3.2)	67 (3.2)
Czech Republic	71 (2.8)	41 (3.2)	18 (3.1)	11 (2.0)	24 (2.7)
Denmark	s 71 (3.7)	s 68 (4.0)	s 30 (3.9)	s 35 (4.3)	s 42 (4.2)
England	r 74 (4.6)	r 91 (2.7)	r 38 (4.2)	r 70 (4.8)	r 65 (4.3)
Finland	61 (2.9)	20 (2.6)	4 (1.1)	17 (2.6)	5 (1.6)
France	r 71 (3.9)	r 62 (3.9)	r 33 (3.5)	r 31 (3.5)	r 36 (3.8)
Georgia	54 (3.9)	53 (4.0)	34 (4.0)	22 (3.5)	35 (3.7)
Germany	r 80 (2.4)	r 67 (3.3)	r 24 (3.1)	r 27 (3.4)	r 61 (3.5)
Hong Kong SAR	s 54 (4.8)	s 60 (4.8)	s 17 (3.9)	s 46 (4.7)	s 39 (4.6)
Hungary	r 77 (3.0)	r 54 (3.8)	r 18 (3.1)	r 25 (3.3)	r 17 (2.9)
Iran, Islamic Rep. of	83 (2.9)	77 (3.0)	59 (3.4)	58 (3.2)	76 (2.7)
Ireland	71 (3.0)	84 (2.9)	16 (2.6)	24 (3.3)	33 (4.0)
Italy	94 (1.4)	79 (3.2)	47 (3.1)	57 (3.6)	63 (3.4)
Japan	59 (4.2)	88 (2.9)	74 (4.0)	58 (4.6)	88 (2.9)
Jordan	84 (3.1)	79 (3.3)	48 (4.5)	69 (4.2)	64 (4.6)
Kazakhstan	r 75 (3.0)	r 65 (3.6)	r 49 (3.7)	r 57 (4.0)	r 53 (3.9)
Korea, Rep. of	42 (4.1)	67 (4.2)	21 (3.5)	53 (4.5)	72 (4.1)
Kosovo	90 (2.6)	49 (4.7)	53 (4.2)	35 (4.2)	39 (3.9)
Kuwait	79 (3.2)	84 (3.0)	39 (4.2)	67 (3.8)	70 (3.2)
Latvia	76 (3.6)	64 (3.9)	48 (4.1)	50 (3.9)	62 (4.2)
Lithuania	60 (3.6)	56 (3.7)	45 (3.5)	43 (3.4)	57 (3.6)
Macao SAR	74 (0.1)	76 (0.1)	33 (0.1)	55 (0.1)	59 (0.1)
Montenegro	94 (1.5)	79 (2.6)	51 (3.1)	50 (2.9)	57 (3.0)
Morocco	95 (1.7)	87 (2.4)	38 (4.2)	68 (3.6)	32 (4.3)
Netherlands	s 43 (5.2)	s 32 (5.1)	s 7 (2.6)	s 7 (2.2)	s 17 (3.8)
New Zealand	s 66 (4.4)	s 69 (4.0)	s 26 (3.3)	s 28 (3.8)	s 49 (4.2)
North Macedonia	r 90 (2.4)	r 73 (3.8)	r 49 (3.8)	r 56 (4.2)	r 60 (4.2)
Norway (5)	s 65 (4.0)	s 53 (3.9)	s 12 (2.2)	s 31 (3.7)	s 17 (3.1)
Oman	74 (3.1)	91 (1.9)	71 (3.1)	77 (2.8)	77 (2.8)
Poland	87 (2.7)	60 (3.9)	31 (3.6)	36 (3.8)	30 (3.9)
Portugal	89 (1.9)	89 (2.0)	36 (3.3)	51 (3.5)	49 (3.8)
Qatar	92 (1.9)	92 (2.0)	67 (3.4)	77 (3.0)	72 (3.1)
Romania	s 90 (4.1)	s 73 (4.7)	s 42 (4.7)	s 42 (5.5)	s 51 (5.5)
Saudi Arabia	91 (2.2)	85 (2.7)	44 (3.9)	78 (3.1)	71 (3.7)
Serbia	86 (2.9)	72 (3.6)	43 (3.8)	39 (3.8)	41 (4.1)
Singapore	63 (2.8)	75 (2.3)	17 (2.2)	65 (2.7)	61 (2.7)
Slovak Republic	61 (3.5)	62 (2.9)	39 (3.3)	36 (3.2)	51 (2.9)
Slovenia	69 (3.0)	63 (3.2)	26 (3.5)	13 (2.5)	33 (3.2)
South Africa (5)	r 83 (3.2)	r 67 (3.8)	r 30 (4.0)	r 46 (4.2)	r 38 (4.1)
Spain	84 (1.9)	72 (2.5)	51 (2.7)	55 (2.5)	61 (2.9)
Sweden	r 79 (3.2)	r 65 (4.2)	r 17 (3.7)	r 66 (4.5)	r 51 (4.1)
Türkiye (5)	64 (4.1)	88 (2.6)	61 (4.1)	60 (4.2)	64 (4.2)
United Arab Emirates	89 (1.1)	87 (1.1)	59 (1.5)	74 (1.4)	72 (1.5)
United States	73 (2.4)	69 (2.4)	32 (2.5)	40 (2.4)	42 (2.7)
Uzbekistan	87 (3.1)	71 (4.1)	71 (4.3)	79 (3.7)	72 (4.4)
International Average	77 (0.4)	70 (0.4)	39 (0.5)	49 (0.5)	50 (0.5)
Benchmarking Participants					
Ontario, Canada	r 80 (3.2)	r 70 (4.0)	r 30 (2.9)	r 44 (3.9)	r 31 (3.5)
Quebec, Canada	89 (2.7)	80 (3.6)	25 (3.6)	57 (4.3)	60 (4.1)
Abu Dhabi, UAE	85 (2.8)	84 (2.0)	49 (2.6)	69 (2.0)	64 (2.7)
Dubai, UAE	92 (1.3)	93 (1.3)	64 (2.5)	78 (2.1)	79 (2.4)
Sharjah, UAE	r 95 (1.9)	r 90 (2.6)	r 70 (4.1)	r 80 (3.7)	r 78 (3.5)

() Standard errors appear in parentheses. Because of rounding some results may appear inconsistent.
 An "r" indicates data are available for at least 70% but less than 85% of the students.
 An "s" indicates data are available for at least 50% but less than 70% of the students.

SOURCE: IEA's Trends in International Mathematics and Science Study - TIMSS 2023
 Downloaded from <https://timss2023.org/results>

Teachers Emphasize Science Inquiry – Teachers’ Reports (Grade 8)

The degree to which teachers emphasize different components of science inquiry in their teaching varies internationally. Science teachers were asked about the emphasis they place on various aspects of inquiry during science lessons. Eighth-grade teachers responded to eight items about their emphasis on activities such as encouraging students to ask questions about scientific phenomena or having students predict the outcomes of experiments or investigations, reflecting the increasing complexity of science teaching as students progress through school (Exhibit 5.3.9).

Exhibit 5.3.10 presents the percentages of eighth-grade students whose teachers reported placing “a lot” of emphasis on the science inquiry practices. On average and within many countries, the most frequently reported science inquiry practices emphasized in the eighth grade were “ask questions about scientific phenomena” and “predict the outcomes of scientific experiments or investigations.” On average internationally, 73 percent and 62 percent, respectively, of students had teachers who reported they emphasized these practices “a lot.” The least commonly reported science inquiry practices emphasized, on average, were “use multiple sources of evidence to explain scientific phenomena” and “create representations to explain scientific phenomena.” Only 42 percent and 40 percent, respectively, of students had teachers who reported they emphasized these practices “a lot.”

About the Items

Exhibit 5.3.10 reports the percentage of students whose teachers responded “a lot” to each of eight items.

How much emphasis do you place on the following when teaching science to students in this class?

	A lot	Some	None
1) Encouraging students to ask questions about scientific phenomena -----	☐	☐	☐
2) Having students predict the outcomes of experiments or investigations -----	☐	☐	☐
3) Having students discuss variation in data from experiments or investigations -----	☐	☐	☐
4) Having students use multiple sources of evidence to explain scientific phenomena ----	☐	☐	☐
5) Having students create representations (e.g., models, graphs) to explain scientific phenomena -----	☐	☐	☐
6) Having students use scientific concepts to explain phenomena -----	☐	☐	☐
7) Having students argue about science questions -----	☐	☐	☐
8) Having students conduct experiments (hands-on or virtually) -----	☐	☐	☐

SOURCE: IEA's Trends in International Mathematics and Science Study - TIMSS 2023
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Exhibit 5.3.10: Teachers Emphasize Science Inquiry – Teachers’ Reports

Country	Percent of Students Whose Teachers Place “A lot” of Emphasis on Science Inquiry Practices							
	Ask Questions about Scientific Phenomena	Predict the Outcomes of Experiments or Investigations	Discuss Variation in Data from Experiments or Investigations	Use Multiple Sources of Evidence to Explain Scientific Phenomena	Create Representations to Explain Scientific Phenomena	Use Scientific Concepts to Explain Phenomena	Argue about Science Questions	Conduct Experiments
Australia	s 76 (3.1)	s 71 (3.5)	s 50 (3.4)	s 28 (3.4)	s 41 (3.5)	s 59 (3.4)	s 16 (2.1)	s 56 (4.0)
Austria	72 (2.0)	46 (2.0)	28 (2.0)	21 (2.2)	16 (1.4)	30 (2.2)	43 (2.7)	31 (1.8)
Azerbaijan	r 91 (1.1)	r 67 (2.3)	r 74 (1.9)	r 61 (1.9)	r 56 (2.2)	r 63 (2.0)	r 68 (1.8)	r 47 (2.0)
Bahrain	89 (2.7)	82 (3.7)	65 (3.3)	53 (2.8)	56 (2.9)	76 (4.0)	70 (2.9)	58 (4.4)
Brazil	76 (1.9)	51 (3.2)	45 (2.7)	42 (2.8)	32 (2.4)	51 (3.0)	54 (2.9)	32 (2.4)
Chile	83 (2.8)	72 (4.0)	53 (4.5)	50 (4.3)	68 (4.3)	75 (3.1)	42 (4.0)	54 (4.0)
Chinese Taipei	57 (4.2)	39 (4.1)	34 (3.9)	39 (4.0)	42 (3.8)	59 (3.9)	20 (2.9)	52 (3.8)
Cyprus	82 (1.1)	80 (1.1)	53 (2.0)	43 (1.7)	40 (1.9)	66 (1.5)	63 (1.5)	48 (1.7)
Czech Republic	44 (1.8)	41 (1.7)	32 (1.8)	41 (1.9)	27 (1.6)	20 (1.6)	33 (1.9)	29 (1.5)
England	s 55 (5.5)	s 56 (5.2)	s 37 (5.3)	s 9 (2.7)	s 35 (4.7)	s 58 (5.2)	s 9 (2.8)	s 54 (4.6)
Finland	51 (2.3)	26 (1.9)	18 (1.2)	14 (1.8)	14 (1.4)	49 (2.0)	25 (1.9)	39 (1.7)
France	90 (1.7)	66 (3.0)	44 (2.5)	34 (2.8)	61 (2.8)	55 (3.2)	23 (2.4)	60 (3.0)
Georgia	59 (1.7)	49 (2.0)	46 (2.2)	39 (2.3)	41 (2.2)	44 (1.6)	53 (1.7)	31 (2.0)
Hong Kong SAR	s 52 (5.0)	s 68 (5.1)	s 40 (5.4)	s 19 (4.1)	s 16 (4.1)	s 52 (5.7)	s 21 (4.4)	s 73 (4.1)
Hungary	r 71 (1.8)	r 43 (1.9)	r 36 (2.2)	r 38 (2.1)	r 28 (2.1)	r 51 (2.2)	r 25 (1.8)	r 24 (1.9)
Iran, Islamic Rep. of	78 (2.7)	69 (3.4)	62 (3.5)	62 (3.4)	48 (3.5)	59 (3.6)	71 (3.0)	59 (3.3)
Ireland	65 (3.4)	77 (3.0)	50 (4.0)	23 (3.4)	33 (3.7)	37 (2.9)	20 (2.6)	53 (3.3)
Israel	77 (2.9)	74 (3.2)	58 (3.7)	42 (3.8)	40 (3.5)	74 (3.4)	67 (3.6)	52 (3.6)
Italy	83 (2.6)	56 (4.0)	48 (3.9)	43 (3.7)	44 (4.0)	52 (3.6)	52 (3.5)	43 (3.9)
Japan	56 (4.8)	61 (4.0)	66 (3.8)	61 (4.4)	69 (4.1)	69 (4.4)	61 (4.7)	80 (3.7)
Jordan	85 (3.0)	72 (3.5)	59 (4.0)	53 (4.1)	44 (4.0)	73 (4.0)	55 (4.1)	53 (4.1)
Kazakhstan	67 (1.9)	56 (1.9)	54 (2.0)	55 (2.2)	49 (2.1)	52 (2.0)	55 (1.9)	50 (1.9)
Korea, Rep. of	54 (3.2)	55 (3.4)	46 (3.5)	49 (3.5)	42 (3.6)	68 (3.4)	23 (3.1)	36 (3.7)
Kuwait	73 (3.9)	73 (3.8)	63 (4.3)	44 (4.5)	35 (3.7)	66 (4.5)	46 (4.3)	62 (4.1)
Lithuania	49 (2.2)	46 (1.8)	45 (1.8)	41 (2.0)	37 (2.0)	55 (2.0)	32 (1.6)	42 (2.0)
Malaysia	68 (3.1)	67 (3.3)	47 (2.8)	38 (2.9)	36 (2.7)	55 (3.4)	40 (3.1)	55 (3.2)
Malta	r 68 (0.5)	r 60 (0.6)	r 45 (0.6)	r 26 (0.5)	r 18 (0.5)	r 47 (0.5)	r 36 (0.5)	r 44 (0.6)
Morocco	87 (1.8)	62 (2.8)	57 (2.7)	47 (2.5)	45 (2.6)	67 (2.4)	52 (2.6)	18 (2.2)
Norway (9)	r 62 (3.6)	r 45 (3.7)	r 19 (2.7)	r 14 (2.6)	r 14 (2.5)	r 53 (3.2)	r 42 (3.3)	r 21 (2.9)
Oman	92 (1.9)	90 (1.8)	83 (2.3)	62 (3.3)	68 (2.9)	73 (3.0)	57 (3.4)	79 (2.8)
Palestinian Nat'l Auth.	87 (2.6)	70 (3.4)	57 (3.3)	47 (3.5)	37 (3.8)	70 (3.5)	90 (2.4)	53 (3.3)
Portugal	88 (1.6)	68 (2.4)	53 (2.7)	40 (2.5)	28 (2.3)	74 (2.3)	55 (2.7)	48 (2.4)
Qatar	89 (2.3)	78 (4.0)	72 (4.2)	62 (4.2)	60 (4.9)	78 (3.7)	63 (4.0)	62 (4.4)
Romania	r 89 (2.1)	r 55 (3.2)	r 54 (3.1)	r 56 (3.4)	r 44 (3.8)	r 61 (2.8)	r 50 (3.6)	r 38 (2.8)
Saudi Arabia	88 (2.6)	81 (3.1)	59 (3.5)	67 (3.9)	50 (3.8)	74 (3.0)	80 (2.9)	57 (3.5)
Singapore	58 (3.4)	42 (3.4)	23 (3.2)	11 (2.1)	11 (2.4)	54 (3.5)	9 (2.1)	30 (3.1)
South Africa (9)	r 79 (3.2)	r 52 (3.8)	r 31 (3.7)	r 33 (3.6)	r 27 (3.1)	r 46 (4.5)	r 39 (4.3)	r 19 (3.0)
Sweden	r 70 (3.2)	r 53 (3.7)	r 40 (3.9)	r 23 (3.0)	r 14 (2.4)	r 78 (3.0)	r 66 (3.5)	r 60 (3.4)
Türkiye	62 (4.0)	77 (3.2)	60 (4.1)	53 (4.2)	53 (3.8)	61 (3.9)	68 (3.7)	63 (3.5)
United Arab Emirates	88 (1.1)	81 (1.4)	69 (1.4)	67 (1.4)	58 (1.6)	77 (1.5)	59 (1.7)	60 (1.3)
United States	72 (3.0)	62 (3.2)	43 (3.1)	43 (3.3)	49 (3.3)	58 (3.2)	26 (2.6)	46 (3.9)
Uzbekistan	89 (1.2)	71 (1.6)	75 (2.0)	78 (1.9)	66 (2.2)	74 (1.9)	86 (1.8)	71 (2.2)
International Average	73 (0.4)	62 (0.5)	50 (0.5)	42 (0.5)	40 (0.5)	60 (0.5)	47 (0.5)	49 (0.5)
Cote d'Ivoire	x 95 (1.6)	x 46 (4.3)	x 46 (5.1)	x 42 (4.4)	x 11 (2.3)	x 38 (4.6)	x 45 (4.7)	x 31 (4.2)
Benchmarking Participants								
Abu Dhabi, UAE	87 (2.0)	r 77 (2.6)	r 63 (2.4)	61 (3.0)	r 53 (2.6)	71 (2.9)	r 57 (3.0)	r 52 (2.4)
Dubai, UAE	89 (2.3)	86 (1.9)	71 (2.2)	65 (2.0)	57 (3.1)	79 (2.8)	52 (3.1)	61 (2.7)
Sharjah, UAE	r 90 (1.6)	r 79 (3.1)	r 68 (3.4)	r 73 (2.5)	r 59 (3.0)	r 81 (3.2)	r 65 (3.7)	r 62 (3.0)

() Standard errors appear in parentheses. Because of rounding some results may appear inconsistent.

An “r” indicates data are available for at least 70% but less than 85% of the students.

An “s” indicates data are available for at least 50% but less than 70% of the students.

An “x” indicates data are available for at least 40% but less than 50% of the students—interpret with caution.

SOURCE: IEA's Trends in International Mathematics and Science Study - TIMSS 2023
Downloaded from <https://timss2023.org/results>

Frequency Students Conduct Experiments in Science Class

The reported frequency of conducting experiments in science lessons does not have a linear relationship with average science achievement for fourth- or eighth-grade students. Students who reported conducting occasional experiments had higher average science achievement than those who reported conducting experiments more frequently or not at all. Students in both grades were asked to report how often they conducted science experiments in their science lessons (Exhibit 5.3.11). Students could respond “at least once a week,” “once or twice a month,” “a few times a year,” or “never.” In countries where eighth-grade students study separate science subjects, students responded to the item for each subject in which they were enrolled (biology, chemistry, physics, earth science).

In fourth grade, 31 percent of students reported that they conducted experiments “at least once a week,” 28 percent “once or twice a month,” 25 percent “a few times a year,” and 15 percent “never,” on average (Exhibit 5.3.12). There is variation in these percentages across countries. Eight countries have more than 50 percent of fourth-grade students reporting that they conduct experiments “at least once a week,” while 23 countries have less than 25 percent of students in this category. Internationally, fourth-grade students who reported doing experiments “once or twice a month” or “a few times a year” had higher average science achievement than students who reported doing experiments “at least once a week” or “never” (500 and 506 vs. 477 and 485, respectively).

In eighth grade, students’ reported frequencies of conducting science experiments varied across science subjects (Exhibits 5.3.13a to 5.3.13e). In countries teaching science as an integrated subject, 26 percent of students reported that they conducted experiments “at least once a week,” 38 percent “once or twice a month,” 24 percent “a few times a year,” and 11 percent reported they “never” conducted experiments, on average. Four countries had more than 40 percent of eighth-grade integrated science students reporting that they do experiments “at least once a week” and four countries had fewer than 10 percent of students who reported this. In countries teaching science as separate subjects, on average, students reported conducting experiments more frequently in chemistry and physics lessons and less frequently in biology and earth science lessons. The percent of students internationally who reported conducting experiments “at least once a week” was highest in chemistry and physics (32 and 31 percent, respectively), while earth science and biology had the highest percentages of students “never” conducting experiments (34 and 23 percent, respectively). In general, across the science subjects internationally, students who reported conducting experiments “once or twice a month” had higher average science achievement than those who reported conducting experiments “at least once a week” or “never.” However, in earth science students who reported “never” conducting experiments

had higher average science achievement than those who reported doing so “once or twice a month.”

Exhibit 5.3.11: Frequency Students Conduct Experiments in Science Lessons

About the Item	
In <science / biology / chemistry / physics / earth science> lessons, how often does your teacher ask you to conduct <science / biology / chemistry / physics / earth science> experiments?	
At least once a week - - -	☐
Once or twice a month - - -	☐
A few times a year - - -	☐
Never - - -	☐

SOURCE: IEA's Trends in International Mathematics and Science Study - TIMSS 2023
Downloaded from <https://timss2023.org/results>

Exhibit 5.3.12: Frequency Students Conduct Experiments in Science Lessons

Country	At Least Once a Week		Once or Twice a Month		A Few Times a Year		Never	
	Percent of Students	Average Achievement	Percent of Students	Average Achievement	Percent of Students	Average Achievement	Percent of Students	Average Achievement
Albania	51 (1.8)	486 (5.1)	26 (1.6)	507 (6.5)	17 (1.3)	501 (6.9)	6 (0.7)	497 (12.1)
Armenia	38 (1.3)	453 (3.2)	29 (0.9)	465 (2.5)	18 (1.0)	465 (4.5)	15 (1.0)	453 (5.2)
Australia	27 (1.3)	534 (4.2)	30 (1.1)	562 (2.9)	32 (1.2)	563 (3.6)	10 (0.9)	541 (5.9)
Azerbaijan	57 (1.0)	426 (3.1)	24 (1.0)	418 (5.8)	9 (0.5)	411 (5.5)	10 (0.6)	427 (5.9)
Bahrain	39 (1.2)	474 (4.9)	30 (1.0)	483 (5.1)	20 (0.9)	482 (5.9)	11 (0.6)	461 (7.2)
Belgium (Flemish)	21 (1.0)	472 (4.2)	35 (1.2)	494 (2.6)	27 (1.1)	500 (3.7)	18 (1.1)	491 (4.7)
Belgium (French)	19 (1.0)	455 (4.8)	31 (1.3)	484 (3.4)	33 (1.2)	498 (3.2)	17 (1.1)	477 (4.7)
Bosnia & Herzegovina	28 (1.1)	423 (6.1)	22 (1.3)	456 (5.0)	27 (1.4)	469 (4.9)	23 (1.0)	456 (4.0)
Brazil	33 (0.8)	396 (2.9)	21 (0.8)	424 (5.6)	23 (0.8)	468 (6.2)	23 (0.7)	438 (3.6)
Bulgaria	23 (1.3)	508 (6.8)	29 (1.5)	530 (7.1)	31 (1.7)	549 (8.4)	17 (1.1)	538 (7.2)
Canada	21 (0.7)	495 (2.9)	30 (0.7)	528 (2.6)	35 (0.8)	537 (2.4)	14 (0.6)	526 (4.3)
Chile	23 (0.9)	445 (3.5)	22 (1.0)	475 (4.4)	35 (1.2)	509 (3.0)	20 (1.2)	483 (4.2)
Chinese Taipei	52 (1.6)	575 (2.0)	38 (1.5)	580 (2.2)	6 (0.5)	549 (6.2)	4 (0.4)	526 (6.8)
Cyprus	43 (1.7)	487 (4.0)	33 (1.2)	502 (3.6)	15 (1.0)	493 (4.6)	9 (1.2)	470 (5.9)
Czech Republic	13 (0.6)	487 (3.5)	21 (0.9)	522 (3.8)	23 (1.0)	542 (3.9)	43 (1.3)	533 (2.5)
Denmark	27 (1.6)	503 (4.2)	38 (1.2)	534 (2.8)	25 (1.3)	536 (3.3)	10 (1.1)	513 (5.1)
England	28 (1.3)	544 (4.0)	43 (1.2)	571 (3.2)	24 (1.2)	564 (5.0)	4 (0.4)	520 (6.6)
Finland	10 (0.6)	481 (5.5)	32 (0.8)	541 (3.7)	40 (0.8)	562 (3.0)	18 (0.8)	548 (4.0)
France	22 (1.1)	466 (4.0)	17 (1.0)	487 (5.5)	35 (1.3)	504 (4.3)	26 (1.5)	494 (4.4)
Georgia	37 (1.0)	458 (3.9)	32 (1.2)	479 (5.0)	16 (0.9)	474 (4.5)	15 (0.9)	453 (4.7)
Germany	31 (1.0)	495 (4.2)	32 (0.9)	515 (3.5)	28 (0.9)	550 (3.6)	9 (0.7)	518 (6.5)
Hong Kong SAR	13 (2.2)	542 (22.1)	25 (1.5)	544 (4.4)	37 (1.7)	554 (4.1)	25 (1.5)	536 (4.5)
Hungary	16 (1.1)	478 (7.1)	16 (0.9)	518 (6.3)	26 (1.0)	555 (3.9)	42 (1.5)	530 (3.9)
Iran, Islamic Rep. of	54 (1.4)	430 (4.8)	25 (1.3)	455 (6.2)	12 (0.6)	440 (7.2)	8 (0.8)	415 (8.4)
Ireland	8 (0.7)	483 (7.3)	31 (1.2)	536 (3.9)	50 (1.3)	543 (3.6)	11 (0.9)	511 (7.1)
Italy	24 (0.9)	484 (4.2)	26 (1.2)	520 (3.3)	34 (1.1)	524 (3.1)	17 (1.1)	515 (4.2)
Japan	60 (2.0)	557 (3.2)	37 (1.7)	562 (2.7)	3 (0.4)	517 (9.1)	1 ~	~ ~
Jordan	49 (1.4)	427 (5.5)	26 (1.1)	417 (6.5)	13 (0.9)	408 (7.2)	11 (1.0)	394 (7.5)
Kazakhstan	42 (0.9)	458 (3.5)	28 (1.0)	469 (6.2)	15 (0.7)	487 (5.3)	15 (0.7)	474 (4.5)
Korea, Rep. of	76 (1.4)	585 (2.5)	21 (1.2)	583 (3.7)	2 ~	~ ~	1 ~	~ ~
Kosovo	46 (1.4)	396 (4.1)	28 (1.2)	416 (5.1)	15 (1.0)	411 (6.1)	10 (0.6)	389 (7.0)
Kuwait	51 (1.3)	374 (5.7)	21 (1.0)	396 (8.0)	14 (1.0)	420 (9.4)	14 (0.8)	382 (8.4)
Latvia	20 (1.4)	501 (4.7)	39 (1.3)	536 (3.2)	31 (1.3)	540 (3.9)	10 (0.8)	501 (5.7)
Lithuania	17 (0.8)	503 (4.7)	28 (1.0)	540 (3.7)	35 (0.9)	553 (3.2)	19 (1.2)	540 (3.7)
Macao SAR	14 (0.4)	515 (3.7)	36 (0.5)	542 (2.0)	41 (0.5)	545 (2.1)	10 (0.3)	504 (4.2)
Montenegro	34 (0.9)	448 (2.5)	22 (0.8)	462 (4.4)	19 (0.9)	478 (3.6)	25 (0.9)	470 (3.5)
Morocco	40 (1.6)	391 (6.5)	32 (1.6)	410 (8.5)	17 (0.9)	389 (6.2)	11 (1.0)	370 (9.4)
Netherlands	13 (0.9)	509 (6.2)	24 (1.1)	522 (3.9)	37 (1.1)	525 (3.0)	26 (1.3)	509 (3.9)
New Zealand	16 (1.0)	479 (5.8)	21 (0.8)	522 (3.6)	35 (1.2)	538 (3.2)	28 (1.3)	519 (4.2)
North Macedonia	45 (1.3)	430 (4.1)	30 (1.2)	453 (4.4)	18 (1.0)	454 (6.0)	7 (0.6)	426 (8.6)
Norway (5)	27 (1.2)	506 (3.8)	34 (1.3)	542 (3.2)	33 (1.3)	545 (3.5)	7 (0.7)	531 (6.4)
Oman	42 (1.0)	438 (5.1)	28 (0.8)	430 (5.3)	20 (0.7)	444 (5.4)	9 (0.5)	410 (6.0)
Poland	11 (0.6)	505 (4.7)	20 (0.9)	544 (3.6)	39 (0.9)	564 (2.4)	30 (1.1)	552 (2.9)
Portugal	30 (1.5)	497 (3.3)	24 (0.9)	516 (4.0)	32 (1.2)	525 (2.6)	15 (0.8)	504 (4.4)
Qatar	41 (0.9)	458 (4.2)	28 (1.0)	489 (5.6)	20 (0.8)	499 (5.1)	11 (0.7)	449 (7.1)
Romania	33 (1.5)	506 (7.8)	29 (1.1)	534 (6.2)	26 (1.2)	550 (5.3)	12 (1.1)	535 (6.7)
Saudi Arabia	48 (1.0)	432 (5.0)	24 (0.8)	429 (4.6)	13 (0.5)	440 (5.9)	16 (0.7)	424 (6.3)
Serbia	18 (1.0)	472 (5.3)	20 (1.2)	512 (5.1)	31 (1.7)	523 (4.5)	31 (1.2)	518 (3.0)
Singapore	32 (0.9)	600 (3.3)	44 (0.9)	620 (3.1)	20 (0.6)	602 (3.6)	4 (0.3)	560 (6.0)
Slovak Republic	17 (0.8)	492 (5.5)	24 (1.3)	521 (6.9)	39 (1.7)	531 (6.0)	20 (1.1)	531 (4.5)
Slovenia	22 (0.7)	489 (3.7)	30 (0.9)	531 (2.7)	31 (0.9)	553 (2.6)	16 (0.7)	524 (4.2)
South Africa (5)	30 (0.9)	300 (6.4)	23 (0.8)	308 (8.0)	24 (0.9)	345 (8.4)	22 (1.1)	271 (8.1)
Spain	16 (0.6)	470 (3.7)	18 (0.7)	493 (3.3)	34 (1.0)	521 (2.4)	32 (1.3)	513 (2.6)
Sweden	21 (1.6)	517 (6.0)	35 (1.5)	543 (3.7)	28 (1.3)	542 (4.1)	16 (1.3)	527 (4.7)
Türkiye (5)	25 (1.4)	545 (5.5)	48 (1.4)	581 (3.3)	16 (0.9)	586 (4.9)	11 (1.0)	556 (5.8)
United Arab Emirates	39 (0.5)	484 (2.3)	34 (0.4)	513 (2.2)	20 (0.3)	515 (2.2)	7 (0.2)	464 (4.0)
United States	25 (0.8)	507 (4.0)	27 (0.9)	543 (3.7)	30 (0.8)	553 (3.6)	18 (0.8)	533 (4.2)
Uzbekistan	66 (1.2)	416 (3.4)	16 (0.8)	407 (5.7)	9 (0.5)	401 (6.3)	9 (0.6)	403 (6.6)
International Average	31 (0.2)	477 (0.7)	28 (0.1)	500 (0.6)	25 (0.1)	506 (0.7)	15 (0.1)	485 (0.8)
Benchmarking Participants								
Ontario, Canada	18 (1.0)	491 (4.5)	29 (1.1)	532 (3.9)	36 (1.1)	543 (3.8)	17 (1.2)	533 (5.8)
Quebec, Canada	22 (1.2)	490 (4.3)	30 (1.2)	509 (3.5)	38 (1.5)	521 (3.6)	10 (0.9)	510 (5.3)
Abu Dhabi, UAE	38 (0.8)	433 (3.4)	33 (0.7)	458 (3.8)	21 (0.5)	471 (4.6)	8 (0.3)	440 (6.3)
Dubai, UAE	33 (1.1)	547 (2.8)	42 (0.9)	578 (2.0)	21 (0.6)	575 (2.3)	4 (0.3)	519 (6.5)
Sharjah, UAE	43 (1.1)	496 (4.1)	31 (0.8)	515 (5.1)	19 (0.7)	522 (3.9)	7 (0.4)	480 (9.3)

() Standard errors appear in parentheses. Because of rounding some results may appear inconsistent.
 A tilde (~) indicates insufficient data to report result.

SOURCE: IEA's Trends in International Mathematics and Science Study - TIMSS 2023
 Downloaded from <https://timss2023.org/results>

Exhibit 5.3.13: Frequency Students Conduct Experiments in Science Lessons

The general/integrated science panel summarizes responses for countries where students are enrolled in science as a single subject. The following panels for biology, chemistry, physics, and earth science summarize responses for countries where students are taught science as separate subjects.

Exhibit 5.3.13a: Frequency Students Conduct Experiments in General/Integrated Science Lessons

General/Integrated Science	At Least Once a Week		Once or Twice a Month		A Few Times a Year		Never	
	Percent of Students	Average Achievement	Percent of Students	Average Achievement	Percent of Students	Average Achievement	Percent of Students	Average Achievement
Australia	37 (1.5)	526 (4.4)	47 (1.2)	531 (3.8)	13 (0.8)	522 (4.9)	3 (0.3)	439 (9.2)
Bahrain	24 (0.7)	432 (4.9)	33 (0.9)	469 (3.7)	29 (0.8)	479 (3.5)	15 (0.8)	430 (5.3)
Brazil	20 (0.6)	361 (3.8)	20 (0.9)	429 (5.0)	27 (0.9)	451 (3.4)	33 (1.1)	431 (3.5)
Chile	13 (0.8)	416 (5.3)	30 (1.4)	457 (3.6)	44 (1.3)	472 (3.4)	13 (1.1)	455 (5.5)
Chinese Taipei	10 (1.1)	555 (6.9)	55 (2.3)	577 (3.0)	25 (1.9)	585 (4.2)	10 (1.4)	538 (6.5)
England	22 (1.8)	528 (8.7)	52 (1.6)	545 (4.7)	19 (1.5)	529 (5.3)	7 (1.1)	488 (14.8)
Hong Kong SAR	48 (2.2)	536 (5.6)	42 (1.8)	533 (5.3)	7 (0.9)	503 (10.4)	2 ~	~ ~
Iran, Islamic Rep. of	37 (1.4)	404 (4.7)	35 (1.1)	433 (3.9)	15 (0.7)	439 (5.4)	13 (1.0)	406 (4.7)
Ireland	22 (1.6)	518 (3.4)	49 (1.8)	541 (5.1)	26 (1.8)	537 (3.9)	4 (0.7)	512 (8.1)
Israel	17 (1.0)	453 (7.9)	34 (1.4)	494 (5.0)	32 (1.3)	497 (4.6)	17 (1.4)	467 (6.5)
Italy	6 (0.4)	458 (8.3)	18 (1.1)	488 (4.1)	43 (1.4)	514 (3.1)	32 (1.7)	501 (4.4)
Japan	34 (2.8)	561 (3.3)	56 (2.6)	559 (4.3)	9 (1.4)	551 (7.4)	1 ~	~ ~
Jordan	44 (1.2)	403 (4.6)	31 (0.9)	430 (4.1)	15 (0.7)	430 (6.8)	10 (0.7)	398 (6.0)
Korea, Rep. of	10 (1.4)	530 (7.5)	53 (2.0)	548 (2.6)	30 (1.8)	553 (3.3)	7 (1.2)	517 (7.4)
Kuwait	36 (1.5)	411 (6.1)	34 (1.1)	435 (6.4)	18 (1.2)	456 (10.0)	12 (0.8)	398 (10.7)
Malaysia	33 (1.2)	414 (4.6)	48 (1.0)	438 (3.4)	14 (0.9)	432 (6.2)	5 (0.6)	385 (11.5)
Norway (9)	9 (1.2)	472 (7.4)	29 (1.5)	503 (3.5)	51 (1.7)	497 (2.7)	11 (1.0)	467 (6.5)
Oman	44 (1.0)	453 (3.5)	31 (0.8)	470 (3.0)	15 (0.7)	472 (5.1)	10 (0.6)	446 (6.0)
Palestinian Nat'l Auth.	45 (0.9)	395 (3.0)	26 (0.7)	403 (3.4)	14 (0.5)	408 (4.8)	15 (0.8)	373 (4.2)
Qatar	31 (1.4)	453 (5.3)	36 (1.3)	502 (5.4)	23 (1.3)	512 (6.9)	10 (0.8)	464 (10.3)
Saudi Arabia	37 (1.0)	396 (4.1)	31 (0.9)	441 (3.9)	18 (0.7)	453 (4.8)	14 (0.7)	416 (6.3)
Singapore	9 (0.7)	589 (13.3)	52 (1.4)	617 (5.9)	37 (1.6)	603 (5.8)	2 ~	~ ~
South Africa (9)	35 (0.8)	328 (3.3)	27 (0.7)	369 (6.2)	26 (0.8)	387 (6.3)	12 (0.7)	389 (6.6)
Türkiye	9 (0.8)	493 (8.1)	39 (1.7)	524 (4.4)	33 (1.1)	550 (4.6)	19 (1.4)	523 (5.8)
United Arab Emirates	29 (0.6)	453 (3.1)	38 (0.4)	506 (2.1)	24 (0.5)	525 (2.8)	9 (0.4)	467 (4.4)
United States	18 (1.2)	496 (6.4)	44 (1.0)	522 (4.0)	29 (1.2)	530 (4.9)	9 (0.7)	490 (8.6)
International Average	26 (0.3)	463 (1.2)	38 (0.3)	491 (0.9)	24 (0.2)	496 (1.1)	11 (0.2)	452 (1.6)
Benchmarking Participants								
Abu Dhabi, UAE	29 (0.8)	406 (5.2)	37 (0.7)	469 (4.0)	23 (0.8)	490 (4.5)	10 (0.6)	434 (5.2)
Dubai, UAE	21 (1.1)	523 (5.2)	41 (0.8)	557 (3.1)	31 (1.3)	565 (4.0)	7 (0.6)	523 (7.5)
Sharjah, UAE	33 (1.6)	472 (6.2)	37 (0.9)	511 (6.3)	21 (1.0)	533 (6.5)	9 (0.9)	489 (8.9)

Separate Science Results

Exhibit 5.3.13b: Frequency Students Conduct Experiments in Biology Lessons

Biology	At Least Once a Week		Once or Twice a Month		A Few Times a Year		Never	
	Percent of Students	Average Achievement	Percent of Students	Average Achievement	Percent of Students	Average Achievement	Percent of Students	Average Achievement
Austria	6 (0.5)	463 (7.7)	14 (0.9)	503 (5.9)	30 (1.2)	527 (3.8)	51 (1.7)	513 (2.9)
Azerbaijan	52 (1.3)	395 (3.4)	22 (0.8)	434 (3.7)	12 (0.7)	441 (5.3)	14 (0.9)	429 (5.3)
Cote d'Ivoire	36 (1.4)	170 (5.5)	18 (0.7)	169 (7.8)	18 (1.0)	194 (14.6)	28 (1.6)	175 (7.0)
Cyprus	8 (0.5)	433 (9.1)	27 (1.4)	478 (8.1)	39 (1.4)	477 (3.3)	26 (1.1)	458 (3.5)
Czech Republic	3 (0.4)	495 (8.9)	18 (1.1)	520 (3.7)	36 (1.1)	541 (2.1)	43 (1.7)	527 (2.7)
Finland	6 (0.4)	475 (8.0)	37 (1.1)	527 (4.2)	45 (1.2)	554 (3.0)	12 (0.7)	546 (5.3)
France	16 (1.1)	460 (5.6)	35 (1.6)	496 (3.3)	36 (1.5)	504 (3.5)	13 (1.4)	471 (6.5)
Georgia	20 (1.3)	428 (6.9)	36 (1.2)	458 (3.2)	25 (1.0)	466 (3.8)	19 (1.2)	453 (3.7)
Hungary	6 (0.7)	443 (13.6)	12 (0.9)	518 (7.8)	28 (1.2)	540 (3.6)	54 (1.6)	523 (3.0)
Kazakhstan	37 (1.3)	417 (3.5)	37 (1.1)	460 (3.9)	15 (0.8)	476 (5.2)	12 (0.9)	456 (6.1)
Lithuania	5 (0.4)	448 (7.4)	23 (1.2)	500 (4.2)	47 (1.2)	534 (3.5)	26 (1.4)	528 (4.3)
Morocco	37 (1.0)	316 (4.2)	24 (0.7)	332 (4.0)	21 (0.7)	343 (4.7)	18 (1.0)	331 (4.9)
Portugal	15 (1.0)	476 (4.9)	41 (1.4)	508 (3.0)	35 (1.3)	520 (3.2)	9 (1.1)	507 (8.5)
Romania	17 (1.2)	424 (7.1)	19 (0.9)	464 (5.7)	34 (1.6)	488 (4.9)	30 (1.8)	483 (4.8)
Sweden	30 (2.3)	517 (4.7)	41 (1.9)	536 (4.2)	21 (1.5)	544 (4.7)	8 (1.2)	523 (9.2)
Uzbekistan	62 (1.2)	386 (4.3)	20 (0.8)	415 (4.6)	10 (0.6)	419 (6.0)	7 (0.7)	407 (7.3)
International Average	22 (0.3)	422 (1.8)	26 (0.3)	457 (1.3)	28 (0.3)	473 (1.4)	23 (0.3)	458 (1.4)
Malta	y	- -	- -	- -	- -	- -	- -	- -

() Standard errors appear in parentheses. Because of rounding some results may appear inconsistent.

An "r" indicates data are available for at least 70% but less than 85% of the students.

A "y" indicates data are available for less than 40% of the students.

A dash (-) indicates comparable data not available.

Exhibit 5.3.13: Frequency Students Conduct Experiments in Science Lessons

Separate Science Results

(Continued)

Exhibit 5.3.13c: Frequency Students Conduct Experiments in Chemistry Lessons

Chemistry		At Least Once a Week		Once or Twice a Month		A Few Times a Year		Never	
Country		Percent of Students	Average Achievement	Percent of Students	Average Achievement	Percent of Students	Average Achievement	Percent of Students	Average Achievement
Austria		31 (1.7)	511 (3.8)	43 (1.3)	521 (2.8)	19 (1.2)	519 (4.2)	8 (0.8)	483 (9.4)
Azerbaijan		51 (1.3)	395 (3.3)	23 (0.9)	426 (4.2)	12 (0.7)	439 (6.2)	15 (0.9)	440 (5.1)
Cote d'Ivoire		43 (1.4)	181 (5.8)	17 (0.5)	179 (8.6)	16 (0.9)	188 (15.4)	24 (1.3)	191 (12.9)
Cyprus		22 (0.8)	448 (5.3)	44 (1.2)	477 (5.1)	26 (1.2)	484 (3.9)	7 (0.7)	451 (7.6)
Czech Republic		11 (0.9)	511 (5.4)	39 (1.6)	534 (2.1)	35 (1.3)	537 (2.6)	15 (1.4)	513 (5.0)
Finland	r	40 (1.5)	559 (4.0)	42 (1.2)	534 (3.3)	16 (0.8)	519 (4.3)	2 ~	~
France		31 (1.7)	480 (4.7)	41 (1.5)	505 (3.8)	20 (1.3)	496 (4.1)	8 (0.9)	455 (8.8)
Georgia		28 (1.4)	435 (4.6)	38 (1.2)	460 (3.3)	19 (0.9)	466 (4.7)	15 (1.2)	452 (5.3)
Hungary		18 (1.4)	508 (7.7)	33 (1.5)	534 (3.7)	26 (1.2)	535 (4.2)	22 (1.4)	502 (4.8)
Kazakhstan		40 (1.3)	426 (3.5)	37 (1.1)	463 (4.0)	13 (0.8)	476 (4.8)	10 (0.9)	456 (7.9)
Lithuania		8 (0.5)	476 (7.9)	38 (1.5)	517 (3.6)	39 (1.3)	537 (3.3)	14 (1.4)	512 (6.6)
Morocco	r	44 (0.9)	321 (3.8)	24 (0.6)	330 (4.0)	18 (0.8)	343 (5.6)	14 (0.8)	327 (4.3)
Portugal		24 (1.6)	488 (4.6)	47 (1.3)	514 (2.6)	25 (1.4)	519 (3.8)	4 (0.6)	475 (8.9)
Romania		24 (1.4)	445 (5.3)	29 (1.5)	480 (5.1)	29 (1.6)	486 (5.6)	19 (1.7)	473 (5.9)
Sweden	r	39 (2.5)	529 (4.4)	42 (2.1)	538 (4.5)	15 (1.0)	536 (6.3)	5 (0.8)	510 (12.6)
Uzbekistan		65 (1.3)	389 (4.2)	20 (0.9)	413 (3.9)	8 (0.6)	415 (7.4)	6 (0.6)	406 (8.0)
International Average		32 (0.4)	444 (1.3)	35 (0.3)	464 (1.1)	21 (0.3)	468 (1.5)	12 (0.3)	443 (2.1)
Malta	y	- -	- -	- -	- -	- -	- -	- -	- -

Exhibit 5.3.13d: Frequency Students Conduct Experiments in Physics Lessons

Physics		At Least Once a Week		Once or Twice a Month		A Few Times a Year		Never	
Country		Percent of Students	Average Achievement	Percent of Students	Average Achievement	Percent of Students	Average Achievement	Percent of Students	Average Achievement
Austria		22 (1.3)	501 (4.3)	39 (1.4)	522 (3.3)	25 (1.2)	523 (3.5)	15 (1.2)	500 (7.2)
Azerbaijan		54 (1.2)	399 (3.4)	23 (0.9)	429 (3.7)	12 (0.7)	434 (5.4)	11 (0.7)	434 (5.7)
Cote d'Ivoire		44 (1.4)	183 (6.0)	18 (0.6)	178 (7.8)	16 (0.9)	188 (13.8)	22 (1.4)	192 (15.1)
Cyprus		28 (0.9)	451 (4.5)	38 (1.3)	479 (4.7)	25 (1.1)	484 (4.2)	10 (0.8)	459 (5.7)
Czech Republic		11 (0.9)	522 (5.7)	31 (1.1)	533 (2.8)	37 (1.1)	538 (2.3)	20 (1.4)	514 (4.7)
Finland	r	31 (1.3)	556 (4.4)	44 (1.0)	543 (3.2)	21 (1.0)	529 (4.4)	4 (0.5)	514 (11.2)
France		31 (1.7)	480 (4.7)	41 (1.5)	505 (3.8)	20 (1.3)	496 (4.1)	8 (0.9)	455 (8.8)
Georgia		18 (1.2)	432 (5.7)	19 (0.9)	455 (4.3)	47 (1.3)	462 (2.9)	16 (1.2)	448 (4.0)
Hungary		19 (1.3)	508 (7.7)	33 (1.3)	537 (3.7)	25 (1.1)	533 (3.4)	23 (1.3)	503 (4.6)
Kazakhstan		44 (1.3)	430 (3.4)	38 (0.9)	464 (3.8)	11 (0.7)	476 (5.0)	7 (0.8)	451 (7.8)
Lithuania		10 (0.6)	479 (6.3)	42 (1.4)	523 (3.1)	36 (1.4)	536 (3.7)	13 (1.0)	503 (6.0)
Malta	r	21 (0.7)	465 (4.0)	61 (0.8)	524 (2.4)	15 (0.7)	531 (4.5)	3 (0.3)	434 (10.8)
Morocco		45 (1.0)	321 (4.0)	22 (0.7)	333 (3.4)	18 (0.8)	341 (5.2)	14 (0.8)	327 (4.0)
Portugal		24 (1.6)	488 (4.6)	47 (1.3)	514 (2.6)	25 (1.4)	519 (3.8)	4 (0.6)	475 (8.9)
Romania	r	23 (1.3)	445 (5.7)	28 (1.4)	482 (4.6)	30 (1.4)	487 (5.3)	19 (1.7)	469 (5.5)
Sweden	r	29 (2.2)	523 (4.2)	41 (1.7)	540 (4.7)	21 (1.3)	542 (4.9)	9 (1.1)	515 (8.8)
Uzbekistan		66 (1.3)	389 (4.0)	20 (0.8)	414 (4.6)	9 (0.6)	423 (7.4)	6 (0.6)	399 (6.2)
International Average		31 (0.3)	445 (1.2)	34 (0.3)	469 (1.0)	23 (0.3)	473 (1.3)	12 (0.2)	447 (1.9)

Exhibit 5.3.13e: Frequency Students Conduct Experiments in Earth Science Lessons

Earth Science		At Least Once a Week		Once or Twice a Month		A Few Times a Year		Never	
Country		Percent of Students	Average Achievement	Percent of Students	Average Achievement	Percent of Students	Average Achievement	Percent of Students	Average Achievement
Austria		9 (0.6)	455 (5.9)	10 (0.7)	482 (4.9)	15 (0.8)	521 (3.8)	66 (1.3)	525 (2.4)
Azerbaijan		54 (1.2)	396 (3.3)	21 (0.8)	424 (3.5)	11 (0.5)	440 (6.1)	14 (0.9)	442 (5.1)
Cote d'Ivoire		40 (1.4)	178 (5.3)	19 (0.7)	181 (8.1)	17 (0.9)	198 (16.4)	24 (1.5)	190 (13.8)
Cyprus	r	10 (0.5)	420 (5.4)	9 (0.6)	441 (8.7)	18 (0.7)	475 (6.7)	63 (1.0)	473 (3.0)
Czech Republic		4 (0.3)	486 (5.8)	7 (0.5)	499 (5.5)	17 (0.7)	536 (2.8)	72 (1.1)	534 (2.1)
Finland		5 (0.4)	471 (8.1)	32 (0.9)	525 (3.7)	40 (1.0)	550 (3.1)	22 (0.8)	558 (4.1)
France		16 (1.1)	460 (5.6)	35 (1.6)	496 (3.3)	36 (1.5)	504 (3.5)	13 (1.4)	471 (6.5)
Georgia		17 (0.9)	420 (6.7)	21 (0.9)	448 (4.3)	20 (0.8)	470 (4.3)	42 (1.4)	459 (2.2)
Hungary		10 (0.7)	471 (10.2)	13 (0.6)	508 (5.1)	20 (0.9)	536 (4.3)	57 (1.2)	530 (2.9)
Kazakhstan		33 (1.1)	418 (3.7)	30 (0.9)	453 (3.3)	16 (0.6)	472 (4.3)	21 (1.0)	470 (5.5)
Lithuania		6 (0.4)	457 (7.5)	15 (0.8)	496 (5.6)	27 (0.9)	527 (3.9)	51 (1.2)	533 (3.3)
Morocco		39 (1.0)	319 (3.9)	23 (0.6)	325 (4.7)	20 (0.7)	346 (4.7)	18 (0.9)	332 (5.3)
Portugal		15 (1.0)	476 (4.9)	41 (1.4)	508 (3.0)	35 (1.3)	520 (3.2)	9 (1.1)	507 (8.5)
Uzbekistan		61 (1.2)	385 (4.2)	20 (0.8)	409 (4.7)	10 (0.6)	425 (5.6)	10 (0.7)	413 (5.7)
International Average		23 (0.2)	415 (1.6)	21 (0.2)	443 (1.4)	22 (0.2)	466 (1.6)	34 (0.3)	460 (1.6)
Malta	x	13 (0.9)	426 (6.5)	18 (0.9)	454 (6.2)	20 (0.9)	509 (5.9)	49 (1.0)	536 (3.4)
Romania	y	- -	- -	- -	- -	- -	- -	- -	- -
Sweden		- -	- -	- -	- -	- -	- -	- -	- -

() Standard errors appear in parentheses. Because of rounding some results may appear inconsistent.

An "r" indicates data are available for at least 70% but less than 85% of the students.

An "x" indicates data are available for at least 40% but less than 50% of the students—interpret with caution.

A "y" indicates data are available for less than 40% of the students.

A dash (-) indicates comparable data not available. A tilde (~) indicates insufficient data to report result.

SOURCE: IEA's Trends in International Mathematics and Science Study - TIMSS 2023

Downloaded from <https://timss2023.org/results>

Student Experiences and Attitudes

Student Experiences at School

Students' Sense of School Belonging

Fourth- and eighth-grade students with a greater sense of school belonging have higher average mathematics and science achievement internationally than those who feel less connected at school. The items in the TIMSS 2023 *Sense of School Belonging* scale (Exhibit 6.1.1) asked students about different aspects of school belonging, such as their own feelings about school and their relationships with others at school. Based on their responses, students were classified as having a “high” sense of belonging, “some” sense of belonging, or “little” sense of belonging.

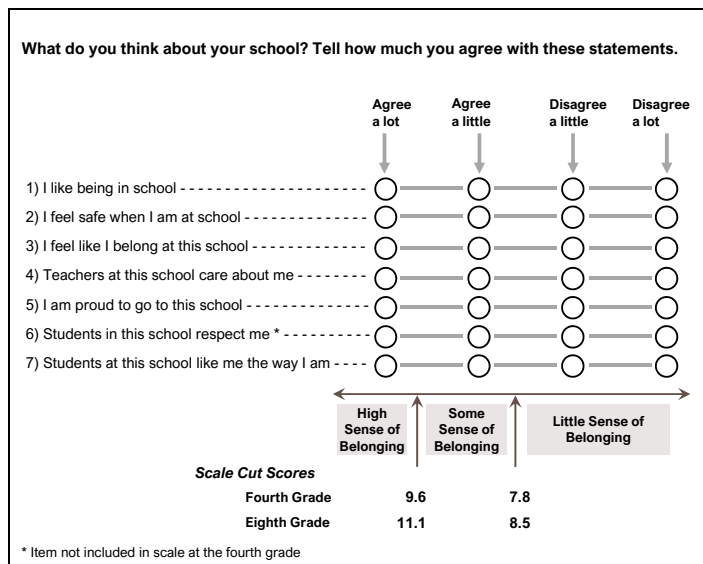
On average internationally, the majority of fourth-grade students were classified as having a “high” sense of belonging or “some” sense of belonging (57% and 30%, respectively). A small percentage of students (12% on average) were classified as having “little” sense of belonging. There is quite a bit of variation in the distribution of students in these categories across countries, notably observed for the percentages of students classified as having “high” and “some” sense of belonging. The differences in average achievement between students with “high” and “some” sense of belonging are small for both subjects (see Exhibits 6.1.2 and 6.1.3). In the fourth grade, students with a “high” sense of belonging have the highest achievement (511 for mathematics and 502 for science), while those with “some” sense of belonging had a slightly lower average achievement (502 in mathematics and 493 in science). In contrast, fourth-grade students with “little” sense of belonging showed a larger difference from the other groups and had the lowest average achievement (486 in mathematics and 478 in science).

Thirty percent of eighth-grade students internationally were classified as having a “high” sense of belonging, 49 percent were classified as having “some” sense of belonging, and 21 percent were classified as having “little” sense of belonging, on average. The relationship between sense of school belonging and average achievement is positive (see Exhibits 6.1.4 and 6.1.5): students with “high” sense of belonging have the highest average achievement (484 in mathematics and 480 in science), followed by those with “some” sense of belonging (478 in mathematics and 477 in science) and those with “little” sense of belonging (461 in mathematics and 463 in science).

Exhibit 6.1.1: Students' Sense of School Belonging

About the Scale

Students were scored according to their responses to seven statements on the *Sense of School Belonging* scale. Cut scores divide the scale into three categories. Students with a **High Sense of School Belonging** had a score at or above the cut score corresponding to "agreeing a lot" with four of the seven statements and "agreeing a little" with the other three statements, on average. Students with **Little Sense of School Belonging** had a score at or below the cut score corresponding to "disagreeing a little" to four of the seven statements and "agreeing a little" with the other three statements, on average. All other students had **Some Sense of School Belonging**.



SOURCE: IEA's Trends in International Mathematics and Science Study - TIMSS 2023
Downloaded from <https://timss2023.org/results>

Exhibit 6.1.2: Students' Sense of School Belonging

Country	High Sense of Belonging		Some Sense of Belonging		Little Sense of Belonging		Average Scale Score
	Percent of Students	Average Achievement	Percent of Students	Average Achievement	Percent of Students	Average Achievement	
Albania	90 (0.9)	518 (5.1)	9 (0.8)	491 (9.8)	1 ~	~ ~	11.9 (0.06)
Armenia	76 (1.0)	519 (2.7)	19 (0.8)	511 (4.3)	5 (0.4)	502 (7.8)	11.0 (0.05)
Australia	54 (1.2)	536 (3.2)	32 (0.9)	522 (3.2)	14 (0.7)	514 (5.4)	9.9 (0.05)
Azerbaijan	72 (1.0)	508 (3.3)	22 (0.8)	492 (4.6)	7 (0.5)	475 (7.1)	10.7 (0.05)
Bahrain	66 (1.2)	472 (4.6)	24 (0.9)	455 (5.0)	10 (0.6)	445 (8.1)	10.4 (0.05)
Belgium (Flemish)	52 (1.1)	531 (2.4)	35 (0.8)	522 (2.9)	14 (0.8)	499 (3.7)	9.8 (0.05)
Belgium (French)	45 (1.0)	495 (2.7)	36 (0.8)	493 (2.9)	18 (0.8)	474 (3.6)	9.5 (0.04)
Bosnia & Herzegovina	50 (1.2)	450 (3.9)	34 (1.1)	455 (3.8)	15 (1.2)	451 (4.7)	9.7 (0.06)
Brazil	62 (0.8)	419 (4.0)	27 (0.6)	402 (4.3)	11 (0.5)	388 (5.6)	10.2 (0.04)
Bulgaria	70 (1.6)	528 (4.3)	23 (1.1)	541 (4.7)	7 (0.8)	522 (9.4)	10.5 (0.07)
Canada	55 (1.1)	513 (2.3)	32 (0.8)	503 (2.4)	14 (0.6)	489 (3.4)	9.9 (0.05)
Chile	61 (1.1)	452 (2.9)	30 (0.9)	444 (3.4)	10 (0.6)	422 (5.6)	10.3 (0.05)
Chinese Taipei	38 (0.9)	613 (2.2)	40 (0.8)	609 (2.0)	22 (0.8)	597 (3.0)	9.1 (0.04)
Cyprus	55 (1.2)	520 (2.7)	30 (0.8)	519 (3.3)	15 (0.9)	504 (5.0)	9.8 (0.05)
Czech Republic	36 (1.1)	535 (3.5)	46 (0.9)	534 (2.3)	18 (0.8)	517 (3.5)	9.1 (0.04)
Denmark	50 (1.4)	534 (2.6)	35 (0.8)	520 (2.3)	15 (0.9)	504 (3.8)	9.7 (0.06)
England	52 (1.2)	565 (4.0)	33 (1.0)	549 (3.8)	15 (0.9)	529 (4.9)	9.7 (0.05)
Finland	57 (1.2)	537 (2.4)	32 (1.0)	530 (3.5)	11 (0.5)	505 (4.8)	10.0 (0.05)
France	45 (1.1)	490 (3.4)	41 (0.9)	488 (3.1)	14 (0.8)	471 (4.9)	9.5 (0.04)
Georgia	75 (1.1)	506 (2.9)	21 (1.0)	492 (5.4)	4 (0.4)	485 (9.4)	10.9 (0.06)
Germany	43 (1.1)	532 (2.8)	39 (0.8)	525 (2.8)	18 (0.8)	511 (3.5)	9.4 (0.04)
Hong Kong SAR	46 (1.2)	606 (4.9)	36 (0.9)	593 (4.0)	18 (0.9)	574 (5.8)	9.5 (0.05)
Hungary	52 (1.2)	527 (3.8)	34 (0.9)	522 (4.3)	14 (0.7)	509 (6.1)	9.8 (0.05)
Iran, Islamic Rep. of	62 (1.1)	420 (4.7)	30 (0.9)	429 (4.2)	8 (0.5)	412 (7.8)	10.2 (0.05)
Ireland	54 (1.2)	552 (3.2)	35 (1.0)	545 (3.9)	11 (0.7)	524 (5.3)	9.8 (0.04)
Italy	52 (1.3)	521 (3.1)	36 (0.9)	514 (3.7)	12 (0.9)	493 (5.8)	9.7 (0.05)
Japan	35 (1.2)	600 (2.7)	47 (1.1)	591 (2.7)	18 (1.0)	576 (4.2)	9.2 (0.05)
Jordan	68 (1.5)	436 (5.9)	21 (1.0)	424 (6.5)	10 (0.9)	400 (8.3)	10.7 (0.08)
Kazakhstan	58 (1.2)	494 (3.9)	33 (1.0)	487 (3.9)	8 (0.5)	480 (5.9)	10.1 (0.05)
Korea, Rep. of	56 (1.1)	603 (2.9)	34 (0.9)	586 (3.1)	10 (0.6)	577 (5.3)	10.0 (0.04)
Kosovo	87 (0.9)	457 (3.4)	10 (0.7)	444 (6.8)	3 (0.4)	404 (14.9)	11.5 (0.04)
Kuwait	61 (1.3)	393 (4.3)	29 (1.1)	387 (6.2)	10 (0.6)	368 (8.8)	10.3 (0.06)
Latvia	27 (1.2)	534 (4.0)	46 (1.0)	539 (3.2)	27 (1.1)	529 (3.7)	8.7 (0.05)
Lithuania	41 (1.3)	567 (3.2)	40 (1.0)	563 (3.4)	19 (0.9)	551 (4.3)	9.3 (0.05)
Macao SAR	42 (0.6)	592 (1.7)	38 (0.6)	580 (1.7)	20 (0.5)	566 (2.4)	9.3 (0.02)
Montenegro	71 (1.0)	484 (2.0)	22 (0.7)	475 (3.9)	7 (0.4)	462 (5.8)	10.7 (0.04)
Morocco	78 (1.2)	400 (5.0)	18 (1.0)	377 (6.6)	5 (0.4)	367 (9.5)	11.1 (0.07)
Netherlands	63 (1.5)	546 (2.1)	28 (1.0)	528 (3.3)	10 (0.8)	511 (4.7)	10.2 (0.07)
New Zealand	53 (1.1)	495 (3.4)	32 (0.8)	495 (2.9)	15 (0.9)	482 (4.3)	9.8 (0.05)
North Macedonia	79 (0.9)	484 (3.6)	16 (0.7)	471 (5.2)	4 (0.4)	442 (7.8)	11.2 (0.04)
Norway (5)	60 (1.2)	537 (2.5)	29 (1.0)	528 (2.7)	10 (0.6)	516 (5.1)	10.1 (0.05)
Oman	64 (0.8)	436 (4.8)	25 (0.6)	410 (3.9)	12 (0.5)	395 (6.2)	10.4 (0.04)
Poland	25 (1.0)	543 (3.6)	45 (0.8)	554 (2.2)	30 (1.0)	540 (2.8)	8.6 (0.04)
Portugal	76 (1.0)	520 (3.0)	19 (0.8)	514 (4.1)	5 (0.5)	503 (5.5)	10.8 (0.05)
Qatar	59 (0.9)	475 (3.7)	27 (0.7)	465 (4.2)	14 (0.6)	438 (5.1)	10.1 (0.04)
Romania	69 (1.5)	548 (4.9)	23 (1.1)	545 (5.1)	8 (0.9)	547 (8.4)	10.6 (0.07)
Saudi Arabia	66 (1.1)	439 (4.3)	23 (0.8)	410 (4.8)	11 (0.6)	391 (6.3)	10.6 (0.06)
Serbia	59 (1.3)	528 (3.4)	29 (1.0)	525 (3.9)	11 (0.7)	513 (4.8)	10.0 (0.06)
Singapore	45 (0.8)	627 (2.9)	37 (0.5)	612 (3.3)	17 (0.6)	591 (3.7)	9.5 (0.03)
Slovak Republic	47 (1.4)	508 (4.4)	37 (1.0)	526 (3.2)	16 (0.9)	518 (3.5)	9.6 (0.06)
Slovenia	40 (1.1)	516 (2.5)	44 (0.9)	518 (2.2)	16 (0.8)	506 (3.4)	9.3 (0.04)
South Africa (5)	61 (1.0)	367 (3.9)	29 (0.8)	358 (5.6)	10 (0.5)	341 (6.3)	10.1 (0.05)
Spain	71 (0.9)	503 (2.2)	22 (0.7)	495 (3.0)	7 (0.5)	475 (5.5)	10.5 (0.04)
Sweden	51 (1.4)	539 (3.0)	36 (1.0)	527 (3.2)	13 (0.7)	508 (6.0)	9.7 (0.05)
Türkiye (5)	65 (1.1)	558 (4.3)	25 (1.0)	550 (5.0)	10 (0.5)	544 (6.3)	10.2 (0.05)
United Arab Emirates	62 (0.5)	516 (1.3)	26 (0.3)	488 (1.8)	12 (0.3)	464 (2.8)	10.3 (0.02)
United States	49 (0.9)	533 (3.4)	34 (0.7)	515 (3.4)	16 (0.6)	491 (4.2)	9.6 (0.04)
Uzbekistan	73 (1.2)	454 (3.4)	21 (1.0)	433 (4.2)	5 (0.5)	406 (7.5)	10.8 (0.05)
International Average	57 (0.1)	511 (0.5)	30 (0.1)	502 (0.5)	12 (0.1)	486 (0.8)	
Benchmarking Participants							
Ontario, Canada	55 (1.9)	512 (3.8)	31 (1.5)	504 (4.1)	13 (0.9)	485 (6.5)	9.9 (0.08)
Quebec, Canada	45 (1.5)	520 (3.0)	37 (1.1)	518 (3.3)	17 (1.1)	503 (4.4)	9.5 (0.07)
Abu Dhabi, UAE	54 (0.8)	479 (2.2)	30 (0.6)	455 (2.8)	16 (0.6)	431 (2.2)	9.9 (0.03)
Dubai, UAE	64 (0.8)	570 (1.8)	26 (0.7)	545 (2.5)	10 (0.5)	524 (5.0)	10.3 (0.03)
Sharjah, UAE	67 (1.3)	518 (3.3)	23 (0.9)	486 (4.7)	10 (0.8)	477 (5.7)	10.5 (0.06)

This TIMSS context questionnaire scale was established in 2023 based on the combined response distribution of countries that participated in TIMSS 2023. To provide a point of reference for country comparisons, the scale centerpoint of 10 was located at the mean of the combined distribution. The units of the scale were chosen so that 2 scale score points corresponded to the standard deviation of the distribution.

() Standard errors appear in parentheses. Because of rounding some results may appear inconsistent.

An "r" indicates data are available for at least 70% but less than 85% of the students.

A tilde (~) indicates insufficient data to report result.

SOURCE: IEA's Trends in International Mathematics and Science Study - TIMSS 2023
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TIMSS & PIRLS
BOSTON COLLEGE

Exhibit 6.1.3: Students' Sense of School Belonging

Country	High Sense of Belonging		Some Sense of Belonging		Little Sense of Belonging		Average Scale Score
	Percent of Students	Average Achievement	Percent of Students	Average Achievement	Percent of Students	Average Achievement	
Albania	90 (0.9)	499 (4.5)	9 (0.8)	473 (10.8)	1 ~	~ ~	11.9 (0.06)
Armenia	76 (1.0)	464 (2.3)	19 (0.8)	454 (4.1)	5 (0.4)	444 (7.3)	11.0 (0.05)
Australia	54 (1.2)	555 (3.1)	32 (0.9)	550 (2.9)	14 (0.7)	546 (4.0)	9.9 (0.05)
Azerbaijan	72 (1.0)	433 (3.4)	22 (0.8)	418 (4.5)	7 (0.5)	409 (7.6)	10.7 (0.05)
Bahrain	66 (1.2)	487 (4.4)	24 (0.9)	467 (5.0)	10 (0.6)	454 (7.7)	10.4 (0.05)
Belgium (Flemish)	52 (1.1)	500 (2.9)	35 (0.8)	487 (2.9)	14 (0.8)	464 (4.5)	9.8 (0.05)
Belgium (French)	45 (1.0)	486 (2.9)	36 (0.8)	484 (3.2)	18 (0.8)	469 (4.6)	9.5 (0.04)
Bosnia & Herzegovina	50 (1.2)	452 (4.5)	34 (1.1)	458 (4.1)	15 (1.2)	451 (5.1)	9.7 (0.06)
Brazil	62 (0.8)	446 (4.0)	27 (0.6)	432 (4.8)	11 (0.5)	414 (4.9)	10.2 (0.04)
Bulgaria	70 (1.6)	526 (5.7)	23 (1.1)	542 (5.6)	7 (0.8)	530 (11.3)	10.5 (0.07)
Canada	55 (1.1)	532 (2.4)	32 (0.8)	518 (2.4)	14 (0.6)	506 (3.1)	9.9 (0.05)
Chile	61 (1.1)	487 (2.8)	30 (0.9)	484 (3.9)	10 (0.6)	455 (6.8)	10.3 (0.05)
Chinese Taipei	38 (0.9)	581 (2.1)	40 (0.8)	573 (2.1)	22 (0.8)	563 (3.3)	9.1 (0.04)
Cyprus	55 (1.2)	494 (3.3)	30 (0.8)	488 (3.7)	15 (0.9)	468 (5.8)	9.8 (0.05)
Czech Republic	36 (1.1)	532 (3.4)	46 (0.9)	529 (2.6)	18 (0.8)	513 (2.9)	9.1 (0.04)
Denmark	50 (1.4)	532 (3.2)	35 (0.8)	519 (2.9)	15 (0.9)	501 (4.1)	9.7 (0.06)
England	52 (1.2)	565 (3.7)	33 (1.0)	556 (3.4)	15 (0.9)	539 (4.6)	9.7 (0.05)
Finland	57 (1.2)	552 (2.8)	32 (1.0)	541 (3.7)	11 (0.5)	513 (5.4)	10.0 (0.05)
France	45 (1.1)	496 (3.6)	41 (0.9)	490 (3.3)	14 (0.8)	477 (4.9)	9.5 (0.04)
Georgia	75 (1.1)	474 (3.3)	21 (1.0)	458 (4.7)	4 (0.4)	448 (11.9)	10.9 (0.06)
Germany	43 (1.1)	525 (3.5)	39 (0.8)	517 (3.7)	18 (0.8)	503 (3.9)	9.4 (0.04)
Hong Kong SAR	46 (1.2)	556 (5.4)	36 (0.9)	541 (4.0)	18 (0.9)	532 (5.8)	9.5 (0.05)
Hungary	52 (1.2)	528 (3.8)	34 (0.9)	527 (3.8)	14 (0.7)	518 (5.7)	9.8 (0.05)
Iran, Islamic Rep. of	62 (1.1)	432 (5.0)	30 (0.9)	444 (4.5)	8 (0.5)	427 (9.5)	10.2 (0.05)
Ireland	54 (1.2)	535 (3.5)	35 (1.0)	533 (3.8)	11 (0.7)	515 (5.5)	9.8 (0.04)
Italy	52 (1.3)	515 (2.5)	36 (0.9)	511 (3.2)	12 (0.9)	501 (6.2)	9.7 (0.05)
Japan	35 (1.2)	561 (2.5)	47 (1.1)	554 (2.8)	18 (1.0)	547 (4.7)	9.2 (0.05)
Jordan	68 (1.5)	430 (5.2)	21 (1.0)	410 (6.4)	10 (0.9)	384 (8.8)	10.7 (0.08)
Kazakhstan	58 (1.2)	474 (3.6)	33 (1.0)	462 (4.1)	8 (0.5)	474 (6.2)	10.1 (0.05)
Korea, Rep. of	56 (1.1)	590 (2.7)	34 (0.9)	577 (3.0)	10 (0.6)	569 (6.0)	10.0 (0.04)
Kosovo	87 (0.9)	408 (3.7)	10 (0.7)	399 (6.9)	3 (0.4)	363 (12.2)	11.5 (0.04)
Kuwait	61 (1.3)	386 (5.4)	29 (1.1)	378 (7.1)	10 (0.6)	364 (11.3)	10.3 (0.06)
Latvia	27 (1.2)	528 (3.7)	46 (1.0)	529 (3.8)	27 (1.1)	520 (4.0)	8.7 (0.05)
Lithuania	41 (1.3)	542 (3.3)	40 (1.0)	539 (3.1)	19 (0.9)	529 (4.5)	9.3 (0.05)
Macao SAR	42 (0.6)	547 (1.8)	38 (0.6)	533 (2.1)	20 (0.5)	519 (3.2)	9.3 (0.02)
Montenegro	71 (1.0)	468 (2.0)	22 (0.7)	459 (4.0)	7 (0.4)	448 (4.8)	10.7 (0.04)
Morocco	78 (1.2)	400 (5.6)	18 (1.0)	367 (7.4)	5 (0.4)	347 (10.9)	11.1 (0.07)
Netherlands	63 (1.5)	527 (2.6)	28 (1.0)	508 (4.2)	10 (0.8)	492 (6.5)	10.2 (0.07)
New Zealand	53 (1.1)	522 (3.9)	32 (0.8)	520 (3.1)	15 (0.9)	514 (4.2)	9.8 (0.05)
North Macedonia	79 (0.9)	452 (3.7)	16 (0.7)	438 (5.3)	4 (0.4)	406 (8.4)	11.2 (0.04)
Norway (5)	60 (1.2)	537 (2.6)	29 (1.0)	529 (3.3)	10 (0.6)	518 (6.5)	10.1 (0.05)
Oman	64 (0.8)	451 (4.6)	25 (0.6)	422 (4.6)	12 (0.5)	397 (6.5)	10.4 (0.04)
Poland	25 (1.0)	545 (3.5)	45 (0.8)	555 (2.3)	30 (1.0)	547 (3.0)	8.6 (0.04)
Portugal	76 (1.0)	512 (2.5)	19 (0.8)	511 (3.1)	5 (0.5)	503 (5.9)	10.8 (0.05)
Qatar	59 (0.9)	487 (3.8)	27 (0.7)	471 (4.5)	14 (0.6)	441 (5.3)	10.1 (0.04)
Romania	69 (1.5)	533 (4.7)	23 (1.1)	530 (5.0)	8 (0.9)	531 (7.8)	10.6 (0.07)
Saudi Arabia	66 (1.1)	452 (4.0)	23 (0.8)	417 (5.4)	11 (0.6)	393 (7.3)	10.6 (0.06)
Serbia	59 (1.3)	516 (3.3)	29 (1.0)	509 (3.6)	11 (0.7)	502 (5.2)	10.0 (0.06)
Singapore	45 (0.8)	617 (2.8)	37 (0.5)	604 (3.1)	17 (0.6)	592 (3.8)	9.5 (0.03)
Slovak Republic	47 (1.4)	513 (4.8)	37 (1.0)	534 (3.6)	16 (0.9)	525 (4.1)	9.6 (0.06)
Slovenia	40 (1.1)	531 (2.8)	44 (0.9)	528 (2.9)	16 (0.8)	514 (4.0)	9.3 (0.04)
South Africa (5)	61 (1.0)	313 (5.5)	29 (0.8)	302 (7.3)	10 (0.5)	282 (8.3)	10.1 (0.05)
Spain	71 (0.9)	508 (2.0)	22 (0.7)	502 (3.4)	7 (0.5)	481 (5.2)	10.5 (0.04)
Sweden	51 (1.4)	545 (3.5)	36 (1.0)	529 (3.4)	13 (0.7)	504 (6.3)	9.7 (0.05)
Türkiye (5)	65 (1.1)	573 (3.6)	25 (1.0)	569 (4.4)	10 (0.5)	565 (5.6)	10.2 (0.05)
United Arab Emirates	62 (0.5)	516 (1.9)	26 (0.3)	483 (2.1)	12 (0.3)	456 (3.7)	10.3 (0.02)
United States	49 (0.9)	547 (3.2)	34 (0.7)	531 (3.2)	16 (0.6)	515 (4.0)	9.6 (0.04)
Uzbekistan	73 (1.2)	423 (3.6)	21 (1.0)	401 (5.0)	5 (0.5)	366 (7.1)	10.8 (0.05)
International Average	57 (0.1)	502 (0.5)	30 (0.1)	493 (0.6)	12 (0.1)	478 (0.8)	
Benchmarking Participants							
Ontario, Canada	55 (1.9)	534 (3.5)	31 (1.5)	527 (4.1)	13 (0.9)	507 (6.0)	9.9 (0.08)
Quebec, Canada	45 (1.5)	513 (3.2)	37 (1.1)	510 (3.3)	17 (1.1)	498 (4.1)	9.5 (0.07)
Abu Dhabi, UAE	54 (0.8)	472 (3.0)	30 (0.6)	442 (3.3)	16 (0.6)	413 (5.2)	9.9 (0.03)
Dubai, UAE	64 (0.8)	576 (2.3)	26 (0.7)	550 (2.4)	10 (0.5)	532 (4.7)	10.3 (0.03)
Sharjah, UAE	67 (1.3)	520 (3.7)	23 (0.9)	482 (4.9)	10 (0.8)	471 (6.4)	10.5 (0.06)

This TIMSS context questionnaire scale was established in 2023 based on the combined response distribution of countries that participated in TIMSS 2023. To provide a point of reference for country comparisons, the scale centerpoint of 10 was located at the mean of the combined distribution. The units of the scale were chosen so that 2 scale score points corresponded to the standard deviation of the distribution.

() Standard errors appear in parentheses. Because of rounding some results may appear inconsistent.

An "r" indicates data are available for at least 70% but less than 85% of the students.

A tilde (~) indicates insufficient data to report result.

SOURCE: IEA's Trends in International Mathematics and Science Study - TIMSS 2023
Downloaded from <https://timss2023.org/results>



TIMSS & PIRLS
BOSTON COLLEGE

Exhibit 6.1.4: Students' Sense of School Belonging

Country	High Sense of Belonging		Some Sense of Belonging		Little Sense of Belonging		Average Scale Score
	Percent of Students	Average Achievement	Percent of Students	Average Achievement	Percent of Students	Average Achievement	
Australia	18 (0.8)	539 (4.8)	50 (0.8)	520 (3.8)	32 (1.0)	484 (4.2)	9.4 (0.05)
Austria	20 (1.0)	519 (3.8)	54 (1.0)	517 (2.5)	26 (1.1)	502 (3.8)	9.6 (0.05)
Azerbaijan	52 (1.2)	487 (4.1)	36 (1.0)	483 (4.7)	12 (0.7)	490 (6.5)	11.0 (0.06)
Bahrain	36 (0.8)	443 (3.1)	45 (0.6)	432 (3.1)	19 (0.8)	405 (3.9)	10.3 (0.04)
Brazil	23 (0.8)	385 (4.3)	49 (0.7)	390 (3.2)	28 (0.7)	374 (3.2)	9.7 (0.04)
Chile	27 (1.0)	427 (3.9)	55 (0.9)	420 (3.3)	18 (0.8)	401 (4.7)	10.1 (0.05)
Chinese Taipei	21 (0.8)	613 (4.6)	59 (0.8)	605 (3.3)	20 (0.8)	586 (4.9)	9.8 (0.04)
Cote d'Ivoire	50 (1.3)	258 (3.7)	45 (1.1)	269 (6.1)	6 (0.4)	263 (13.7)	11.0 (0.05)
Cyprus	16 (0.6)	507 (5.9)	46 (0.9)	506 (3.4)	38 (0.9)	486 (2.7)	9.2 (0.04)
Czech Republic	8 (0.5)	535 (6.1)	55 (0.9)	527 (2.5)	37 (1.0)	504 (2.6)	9.0 (0.03)
England	14 (1.0)	561 (7.5)	50 (1.0)	536 (4.9)	36 (1.4)	502 (5.3)	9.2 (0.06)
Finland	22 (0.7)	514 (3.7)	54 (0.8)	514 (2.7)	24 (0.8)	487 (3.4)	9.7 (0.04)
France	12 (0.6)	486 (6.1)	62 (0.9)	487 (3.3)	26 (1.0)	464 (3.6)	9.3 (0.03)
Georgia	40 (1.3)	471 (5.1)	45 (0.9)	472 (3.1)	15 (0.8)	462 (4.8)	10.5 (0.06)
Hong Kong SAR	22 (1.0)	592 (6.2)	55 (0.9)	583 (5.3)	23 (1.1)	547 (7.0)	9.8 (0.06)
Hungary	18 (0.9)	517 (5.9)	53 (1.0)	507 (4.1)	29 (1.2)	498 (4.3)	9.5 (0.05)
Iran, Islamic Rep. of	27 (0.8)	422 (5.4)	51 (0.8)	425 (3.6)	22 (0.9)	424 (4.0)	9.9 (0.04)
Ireland	21 (0.8)	541 (3.3)	53 (1.0)	528 (2.9)	26 (1.0)	499 (3.7)	9.7 (0.04)
Israel	29 (1.1)	487 (5.5)	48 (0.8)	497 (3.9)	22 (0.9)	477 (4.7)	10.0 (0.05)
Italy	17 (0.9)	518 (4.2)	57 (0.9)	505 (3.0)	26 (1.1)	484 (4.1)	9.5 (0.05)
Japan	21 (0.9)	606 (3.3)	61 (1.0)	597 (3.6)	19 (1.0)	579 (5.7)	9.9 (0.05)
Jordan	50 (1.1)	396 (3.7)	36 (0.8)	388 (3.9)	14 (0.8)	388 (4.3)	10.9 (0.06)
Kazakhstan	36 (1.1)	459 (4.6)	54 (1.0)	455 (3.6)	10 (0.5)	443 (4.9)	10.5 (0.04)
Korea, Rep. of	36 (1.0)	611 (4.0)	51 (0.9)	593 (3.4)	13 (0.7)	569 (5.4)	10.5 (0.04)
Kuwait	35 (1.2)	409 (7.1)	45 (0.9)	403 (4.9)	20 (0.9)	382 (5.3)	10.2 (0.05)
Lithuania	16 (0.7)	518 (5.8)	52 (0.9)	519 (3.4)	32 (0.9)	506 (3.5)	9.4 (0.04)
Malaysia	27 (0.8)	418 (4.7)	61 (0.7)	411 (3.4)	12 (0.5)	398 (4.4)	10.2 (0.03)
Malta	20 (0.6)	520 (3.2)	49 (0.8)	508 (2.1)	31 (0.7)	482 (2.3)	9.5 (0.03)
Morocco	49 (1.0)	374 (3.1)	39 (0.9)	383 (3.6)	12 (0.5)	386 (4.4)	10.9 (0.04)
Norway (9)	32 (1.1)	512 (2.9)	49 (0.7)	508 (2.5)	19 (1.0)	479 (3.5)	10.1 (0.06)
Oman	32 (0.8)	423 (3.0)	46 (0.6)	415 (3.1)	22 (0.7)	403 (4.0)	10.1 (0.04)
Palestinian Nat'l Auth.	45 (1.0)	394 (3.2)	36 (0.7)	387 (3.4)	20 (0.8)	377 (4.7)	10.6 (0.05)
Portugal	23 (0.9)	488 (3.1)	54 (0.9)	478 (2.9)	23 (0.9)	462 (3.9)	9.8 (0.04)
Qatar	31 (1.4)	463 (6.1)	45 (1.1)	462 (4.6)	24 (1.1)	427 (5.2)	10.0 (0.07)
Romania	36 (1.3)	501 (5.5)	43 (1.2)	503 (5.4)	21 (1.2)	502 (5.8)	10.3 (0.06)
Saudi Arabia	48 (1.1)	406 (4.0)	39 (0.9)	400 (3.4)	13 (0.6)	391 (4.6)	10.9 (0.05)
Singapore	30 (1.2)	630 (6.0)	54 (0.9)	605 (6.2)	16 (0.7)	564 (7.8)	10.2 (0.05)
South Africa (9)	35 (1.0)	388 (3.3)	52 (0.7)	397 (3.6)	13 (0.7)	411 (4.7)	10.3 (0.04)
Sweden	23 (0.9)	531 (3.9)	54 (0.8)	524 (2.7)	23 (0.8)	504 (3.9)	9.8 (0.04)
Türkiye	32 (1.2)	517 (5.8)	46 (0.8)	508 (4.9)	22 (0.9)	503 (5.7)	10.1 (0.05)
United Arab Emirates	38 (0.7)	505 (2.4)	42 (0.5)	498 (1.9)	20 (0.4)	460 (2.0)	10.4 (0.03)
United States	19 (0.9)	509 (6.5)	51 (1.0)	497 (4.0)	30 (0.9)	469 (4.5)	9.5 (0.04)
Uzbekistan	72 (1.0)	428 (4.7)	24 (0.9)	414 (4.9)	4 (0.4)	417 (12.1)	12.0 (0.05)
International Average	30 (0.1)	484 (0.7)	49 (0.1)	478 (0.6)	21 (0.1)	461 (0.8)	
Benchmarking Participants							
Abu Dhabi, UAE	31 (1.0)	476 (3.5)	44 (0.6)	465 (2.6)	25 (0.9)	436 (3.0)	10.0 (0.05)
Dubai, UAE	35 (1.0)	568 (3.2)	46 (0.9)	550 (2.9)	18 (0.6)	504 (4.6)	10.4 (0.04)
Sharjah, UAE	45 (2.2)	504 (7.3)	38 (1.4)	502 (4.3)	17 (1.1)	469 (4.4)	10.7 (0.11)

This TIMSS context questionnaire scale was established in 2023 based on the combined response distribution of countries that participated in TIMSS 2023. To provide a point of reference for country comparisons, the scale centerpoint of 10 was located at the mean of the combined distribution. The units of the scale were chosen so that 2 scale score points corresponded to the standard deviation of the distribution.

() Standard errors appear in parentheses. Because of rounding some results may appear inconsistent.

SOURCE: IEA's Trends in International Mathematics and Science Study - TIMSS 2023
Downloaded from <https://timss2023.org/results>

Exhibit 6.1.5: Students' Sense of School Belonging

Country	High Sense of Belonging		Some Sense of Belonging		Little Sense of Belonging		Average Scale Score
	Percent of Students	Average Achievement	Percent of Students	Average Achievement	Percent of Students	Average Achievement	
Australia	18 (0.8)	544 (4.7)	50 (0.8)	533 (3.2)	32 (1.0)	498 (4.4)	9.4 (0.05)
Austria	20 (1.0)	516 (4.4)	54 (1.0)	516 (2.6)	26 (1.1)	504 (3.9)	9.6 (0.05)
Azerbaijan	52 (1.2)	417 (3.1)	36 (1.0)	417 (3.7)	12 (0.7)	425 (5.7)	11.0 (0.06)
Bahrain	36 (0.8)	470 (3.1)	45 (0.6)	457 (3.9)	19 (0.8)	432 (4.1)	10.3 (0.04)
Brazil	23 (0.8)	422 (4.0)	49 (0.7)	431 (3.0)	28 (0.7)	423 (2.9)	9.7 (0.04)
Chile	27 (1.0)	462 (3.5)	55 (0.9)	462 (2.5)	18 (0.8)	440 (4.9)	10.1 (0.05)
Chinese Taipei	21 (0.8)	578 (4.2)	59 (0.8)	575 (2.5)	20 (0.8)	560 (4.2)	9.8 (0.04)
Cote d'Ivoire	50 (1.3)	172 (5.7)	45 (1.1)	196 (10.3)	6 (0.4)	194 (20.9)	11.0 (0.05)
Cyprus	16 (0.6)	475 (6.2)	46 (0.9)	475 (3.5)	38 (0.9)	459 (3.1)	9.2 (0.04)
Czech Republic	8 (0.5)	542 (5.5)	55 (0.9)	535 (2.2)	37 (1.0)	515 (2.5)	9.0 (0.03)
England	14 (1.0)	562 (7.8)	50 (1.0)	542 (4.7)	36 (1.4)	511 (5.4)	9.2 (0.06)
Finland	22 (0.7)	542 (4.4)	54 (0.8)	543 (3.1)	24 (0.8)	514 (4.3)	9.7 (0.04)
France	12 (0.6)	491 (5.7)	62 (0.9)	494 (3.1)	26 (1.0)	476 (4.0)	9.3 (0.03)
Georgia	40 (1.3)	452 (4.4)	45 (0.9)	452 (2.9)	15 (0.8)	448 (4.5)	10.5 (0.06)
Hong Kong SAR	22 (1.0)	540 (6.0)	55 (0.9)	535 (5.2)	23 (1.1)	506 (6.0)	9.8 (0.06)
Hungary	18 (0.9)	534 (5.6)	53 (1.0)	521 (3.6)	29 (1.2)	517 (3.6)	9.5 (0.05)
Iran, Islamic Rep. of	27 (0.8)	413 (5.7)	51 (0.8)	419 (3.6)	22 (0.9)	428 (3.8)	9.9 (0.04)
Ireland	21 (0.8)	541 (3.2)	53 (1.0)	531 (3.9)	26 (1.0)	508 (5.4)	9.7 (0.04)
Israel	29 (1.1)	481 (5.0)	48 (0.8)	488 (3.8)	22 (0.9)	475 (4.5)	10.0 (0.05)
Italy	17 (0.9)	512 (4.4)	57 (0.9)	506 (3.1)	26 (1.1)	485 (4.2)	9.5 (0.05)
Japan	21 (0.9)	565 (3.8)	61 (1.0)	559 (3.2)	19 (1.0)	547 (6.3)	9.9 (0.05)
Jordan	50 (1.1)	422 (4.2)	36 (0.8)	412 (4.3)	14 (0.8)	415 (4.6)	10.9 (0.06)
Kazakhstan	36 (1.1)	449 (3.9)	54 (1.0)	440 (3.2)	10 (0.5)	449 (4.7)	10.5 (0.04)
Korea, Rep. of	36 (1.0)	557 (3.1)	51 (0.9)	543 (2.6)	13 (0.7)	522 (4.5)	10.5 (0.04)
Kuwait	35 (1.2)	431 (7.0)	45 (0.9)	427 (5.7)	20 (0.9)	405 (6.0)	10.2 (0.05)
Lithuania	16 (0.7)	517 (5.5)	52 (0.9)	523 (3.3)	32 (0.9)	517 (3.2)	9.4 (0.04)
Malaysia	27 (0.8)	432 (4.8)	61 (0.7)	429 (3.6)	12 (0.5)	407 (4.9)	10.2 (0.03)
Malta	20 (0.6)	521 (4.0)	49 (0.8)	511 (2.5)	31 (0.7)	485 (2.8)	9.5 (0.03)
Morocco	49 (1.0)	324 (3.8)	39 (0.9)	332 (4.0)	12 (0.5)	333 (4.8)	10.9 (0.04)
Norway (9)	32 (1.1)	500 (3.4)	49 (0.7)	498 (2.7)	19 (1.0)	466 (4.2)	10.1 (0.06)
Oman	32 (0.8)	467 (3.3)	46 (0.6)	462 (2.9)	22 (0.7)	451 (3.8)	10.1 (0.04)
Palestinian Nat'l Auth.	45 (1.0)	407 (3.4)	36 (0.7)	397 (3.3)	20 (0.8)	388 (4.7)	10.6 (0.05)
Portugal	23 (0.9)	517 (3.0)	54 (0.9)	508 (2.7)	23 (0.9)	494 (3.5)	9.8 (0.04)
Qatar	31 (1.4)	493 (6.0)	45 (1.1)	491 (4.7)	24 (1.1)	459 (5.4)	10.0 (0.07)
Romania	36 (1.3)	466 (4.9)	43 (1.2)	476 (4.2)	21 (1.2)	480 (4.8)	10.3 (0.06)
Saudi Arabia	48 (1.1)	429 (3.7)	39 (0.9)	425 (3.9)	13 (0.6)	421 (5.3)	10.9 (0.05)
Singapore	30 (1.2)	627 (5.8)	54 (0.9)	607 (5.9)	16 (0.7)	568 (6.9)	10.2 (0.05)
South Africa (9)	35 (1.0)	347 (3.9)	52 (0.7)	363 (4.5)	13 (0.7)	395 (6.3)	10.3 (0.04)
Sweden	23 (0.9)	534 (4.8)	54 (0.8)	530 (3.4)	23 (0.8)	507 (4.1)	9.8 (0.04)
Türkiye	32 (1.2)	535 (4.6)	46 (0.8)	528 (4.2)	22 (0.9)	529 (5.0)	10.1 (0.05)
United Arab Emirates	38 (0.7)	504 (2.7)	42 (0.5)	499 (2.2)	20 (0.4)	459 (2.5)	10.4 (0.03)
United States	19 (0.9)	528 (6.3)	51 (1.0)	521 (3.7)	30 (0.9)	501 (4.2)	9.5 (0.04)
Uzbekistan	72 (1.0)	401 (3.8)	24 (0.9)	394 (4.6)	4 (0.4)	407 (9.2)	12.0 (0.05)
International Average	30 (0.1)	480 (0.7)	49 (0.1)	477 (0.6)	21 (0.1)	463 (0.9)	
Benchmarking Participants							
Abu Dhabi, UAE	31 (1.0)	465 (5.4)	44 (0.6)	459 (3.5)	25 (0.9)	429 (4.1)	10.0 (0.05)
Dubai, UAE	35 (1.0)	569 (3.9)	46 (0.9)	553 (3.3)	18 (0.6)	506 (4.7)	10.4 (0.04)
Sharjah, UAE	45 (2.2)	508 (7.8)	38 (1.4)	506 (4.5)	17 (1.1)	474 (5.1)	10.7 (0.11)

This TIMSS context questionnaire scale was established in 2023 based on the combined response distribution of countries that participated in TIMSS 2023. To provide a point of reference for country comparisons, the scale centerpoint of 10 was located at the mean of the combined distribution. The units of the scale were chosen so that 2 scale score points corresponded to the standard deviation of the distribution.

() Standard errors appear in parentheses. Because of rounding some results may appear inconsistent.

SOURCE: IEA's Trends in International Mathematics and Science Study - TIMSS 2023
Downloaded from <https://timss2023.org/results>

Student Bullying (Grade 4)

Frequently experiencing bullying behaviors from other students in school is associated with lower average achievement in both mathematics and science for fourth-grade students. Students who experience occasional bullying also have lower average achievement in both subjects compared to students who are not bullied, but to a lesser degree than those more frequently bullied. The TIMSS 2023 fourth-grade *Student Bullying* scale (Exhibit 6.1.6) classified students based on their reports of how frequently they experienced different types of bullying within the past school year. Based on these responses, students were classified as being bullied “never or almost never,” “about monthly,” or “about weekly.”

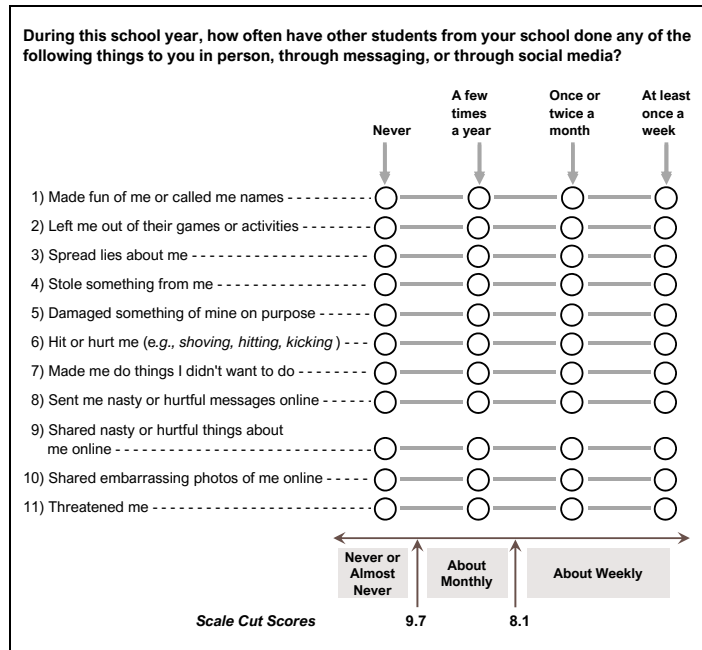
Internationally, about half of all fourth-grade students (53%) were classified as being bullied “never or almost never.” About one-third of students (31% on average) were classified as being bullied “about monthly,” and 15% of students were classified as being bullied “about weekly.” There is variation in these percentages across countries, particularly within the “about weekly” category. Fifteen countries have 20 percent or more of students classified as being bullied “about weekly,” whereas 14 countries have less than 10 percent of students in this category.

Average achievement for students in each of the scale categories is presented in Exhibits 6.1.7 and 6.1.8 for mathematics and science, respectively. Fourth-grade students classified as being bullied “never or almost never” had the highest average achievement in both subjects (520 in mathematics and 513 in science). These students had slightly higher average achievement compared to those who were classified as being bullied “about monthly” (504 in mathematics and 495 in science). Those students classified as being bullied “about weekly” had much lower average achievement in both subjects (461 in mathematics and 450 in science).

Exhibit 6.1.6: Student Bullying

About the Scale

Students were scored according to their reports regarding eleven bullying behaviors on the *Student Bullying* scale. Cut scores divide the scale into three categories. Students bullied **Never or Almost Never** had a score at or above the cut score corresponding to reporting that they “never” experienced six of the eleven bullying behaviors and experienced the other five “a few times a year,” on average. Students bullied **About Weekly** had a score at or below the cut score corresponding to reporting that they experienced six of the eleven behaviors “once or twice a month” and the other five “a few times a year,” on average. All other students were bullied **About Monthly**.



SOURCE: IEA's Trends in International Mathematics and Science Study - TIMSS 2023
Downloaded from <https://timss2023.org/results>

Exhibit 6.1.7: Student Bullying

Country	Never or Almost Never		About Monthly		About Weekly		Average Scale Score
	Percent of Students	Average Achievement	Percent of Students	Average Achievement	Percent of Students	Average Achievement	
Albania	79 (1.4)	523 (4.7)	13 (1.1)	502 (7.9)	8 (1.1)	464 (11.9)	11.1 (0.09)
Armenia	73 (1.2)	528 (2.5)	14 (0.7)	504 (4.4)	13 (0.8)	478 (4.7)	10.9 (0.06)
Australia	48 (1.0)	541 (3.1)	39 (0.8)	529 (3.0)	13 (0.7)	486 (4.9)	9.7 (0.04)
Azerbaijan	53 (1.2)	522 (3.3)	27 (0.8)	498 (3.9)	20 (0.8)	456 (4.6)	10.0 (0.05)
Bahrain	43 (1.3)	487 (4.9)	29 (0.9)	466 (5.2)	28 (1.2)	430 (5.2)	9.4 (0.06)
Belgium (Flemish)	50 (1.1)	533 (2.2)	40 (1.1)	523 (2.5)	11 (0.6)	475 (4.9)	9.8 (0.03)
Belgium (French)	38 (1.0)	506 (2.6)	44 (0.9)	493 (2.7)	18 (0.9)	452 (4.2)	9.4 (0.04)
Bosnia & Herzegovina	58 (1.3)	467 (3.5)	22 (1.1)	451 (6.5)	20 (1.7)	412 (5.7)	10.1 (0.09)
Brazil	48 (1.0)	427 (4.0)	28 (0.8)	418 (4.3)	24 (0.8)	368 (4.2)	9.7 (0.04)
Bulgaria	52 (1.7)	544 (4.4)	35 (1.2)	529 (3.9)	12 (1.0)	481 (8.4)	9.9 (0.07)
Canada	49 (0.9)	519 (2.2)	37 (0.6)	504 (2.3)	13 (0.5)	465 (3.3)	9.8 (0.03)
Chile	52 (1.2)	462 (3.2)	30 (1.0)	451 (3.1)	18 (0.8)	392 (3.9)	9.8 (0.05)
Chinese Taipei	65 (0.8)	612 (1.9)	28 (0.7)	605 (2.1)	7 (0.5)	577 (4.5)	10.5 (0.03)
Cyprus	53 (1.0)	529 (2.5)	32 (0.8)	515 (3.0)	15 (0.8)	479 (4.7)	10.0 (0.05)
Czech Republic	57 (1.1)	543 (2.2)	34 (0.9)	525 (2.8)	9 (0.5)	488 (4.1)	10.2 (0.04)
Denmark	49 (1.1)	535 (2.8)	42 (0.9)	523 (2.3)	10 (0.6)	480 (4.7)	9.7 (0.04)
England	51 (1.4)	567 (3.9)	38 (1.1)	552 (3.4)	12 (0.7)	507 (5.7)	9.8 (0.05)
Finland	71 (0.9)	538 (2.3)	24 (0.8)	524 (3.7)	6 (0.4)	470 (6.2)	10.6 (0.04)
France	66 (1.1)	499 (2.7)	26 (1.0)	473 (4.5)	8 (0.5)	420 (5.9)	10.5 (0.04)
Georgia	69 (1.2)	514 (3.1)	18 (0.9)	498 (5.3)	13 (0.7)	448 (4.8)	10.7 (0.06)
Germany	47 (0.8)	542 (2.3)	40 (0.7)	522 (2.8)	13 (0.6)	478 (4.9)	9.7 (0.03)
Hong Kong SAR	64 (1.1)	604 (3.4)	26 (1.0)	594 (7.2)	9 (0.7)	539 (7.7)	10.4 (0.04)
Hungary	52 (1.1)	532 (3.3)	36 (0.8)	528 (4.2)	11 (0.8)	468 (7.6)	9.9 (0.05)
Iran, Islamic Rep. of	44 (1.2)	441 (4.4)	37 (1.0)	423 (4.6)	20 (0.9)	377 (6.4)	9.6 (0.05)
Ireland	65 (1.1)	556 (2.9)	27 (0.9)	539 (3.6)	8 (0.6)	486 (6.2)	10.4 (0.05)
Italy	47 (1.0)	527 (3.2)	39 (0.9)	515 (3.4)	14 (0.7)	471 (4.5)	9.7 (0.04)
Japan	73 (1.4)	594 (2.3)	24 (1.2)	589 (3.0)	3 (0.4)	549 (11.1)	10.9 (0.06)
Jordan	52 (2.1)	445 (6.5)	23 (1.1)	422 (7.7)	25 (1.6)	402 (5.4)	9.9 (0.10)
Kazakhstan	46 (1.1)	507 (3.6)	35 (0.9)	491 (3.9)	19 (0.8)	450 (4.9)	9.7 (0.05)
Korea, Rep. of	73 (1.0)	598 (2.7)	23 (0.9)	588 (4.0)	4 (0.4)	566 (11.7)	10.9 (0.04)
Kosovo	58 (1.3)	467 (3.5)	24 (0.8)	456 (4.8)	17 (1.0)	409 (5.3)	10.2 (0.06)
Kuwait	41 (1.5)	416 (4.9)	32 (1.1)	398 (5.1)	28 (1.4)	338 (5.9)	9.4 (0.08)
Latvia	36 (1.3)	551 (3.0)	41 (1.1)	539 (3.3)	22 (1.0)	504 (3.7)	9.2 (0.05)
Lithuania	46 (1.3)	575 (3.0)	36 (1.1)	565 (3.2)	18 (0.8)	524 (4.2)	9.5 (0.05)
Macao SAR	51 (0.7)	594 (1.5)	37 (0.6)	577 (1.9)	12 (0.4)	546 (3.0)	9.9 (0.02)
Montenegro	65 (1.0)	495 (2.1)	18 (0.7)	476 (3.5)	18 (0.8)	435 (3.3)	10.5 (0.05)
Morocco	43 (1.6)	422 (6.2)	40 (1.3)	387 (4.9)	18 (1.1)	344 (5.0)	9.6 (0.06)
Netherlands	60 (1.4)	546 (2.1)	32 (1.1)	535 (2.9)	8 (0.7)	489 (5.5)	10.2 (0.05)
New Zealand	41 (1.1)	504 (3.3)	41 (0.8)	499 (3.1)	18 (0.9)	458 (4.0)	9.4 (0.04)
North Macedonia	52 (1.3)	496 (3.7)	25 (1.0)	485 (4.8)	23 (1.0)	441 (4.5)	9.8 (0.06)
Norway (5)	63 (1.0)	538 (2.4)	31 (0.9)	528 (2.4)	6 (0.4)	495 (5.5)	10.3 (0.04)
Oman	33 (1.1)	457 (6.5)	30 (0.8)	423 (3.9)	37 (1.1)	396 (3.9)	8.9 (0.06)
Poland	62 (1.1)	555 (1.9)	30 (0.9)	543 (3.0)	9 (0.5)	500 (4.8)	10.3 (0.04)
Portugal	48 (1.2)	529 (2.8)	39 (0.9)	521 (3.1)	13 (0.7)	470 (4.8)	9.7 (0.04)
Qatar	40 (1.1)	491 (4.1)	32 (0.9)	472 (4.2)	28 (0.9)	428 (4.4)	9.3 (0.05)
Romania	55 (1.4)	558 (4.8)	30 (1.1)	551 (4.9)	15 (1.1)	507 (7.1)	9.9 (0.06)
Saudi Arabia	46 (1.1)	452 (4.7)	24 (0.7)	418 (4.8)	30 (1.0)	395 (4.8)	9.5 (0.06)
Serbia	67 (1.3)	537 (3.2)	22 (1.0)	514 (4.0)	11 (0.8)	479 (6.0)	10.5 (0.06)
Singapore	53 (0.8)	631 (2.5)	35 (0.7)	611 (3.5)	12 (0.5)	558 (5.8)	9.9 (0.03)
Slovak Republic	60 (1.4)	522 (3.5)	31 (1.1)	516 (4.1)	9 (0.6)	478 (5.9)	10.3 (0.05)
Slovenia	60 (0.9)	526 (1.9)	28 (0.7)	515 (2.7)	13 (0.7)	466 (4.3)	10.2 (0.04)
South Africa (5)	25 (1.1)	411 (7.1)	46 (0.9)	363 (3.9)	29 (1.1)	319 (3.5)	8.9 (0.04)
Spain	52 (0.9)	509 (2.3)	36 (0.7)	500 (2.6)	13 (0.6)	463 (3.7)	9.9 (0.03)
Sweden	63 (1.1)	543 (2.6)	30 (0.9)	520 (3.8)	7 (0.5)	476 (8.1)	10.3 (0.04)
Türkiye (5)	43 (1.1)	572 (3.9)	41 (0.9)	553 (4.6)	16 (0.7)	506 (6.1)	9.6 (0.04)
United Arab Emirates	47 (0.5)	528 (1.4)	30 (0.4)	503 (1.7)	23 (0.4)	447 (2.5)	9.7 (0.03)
United States	51 (0.9)	537 (3.2)	34 (0.7)	519 (3.6)	14 (0.6)	463 (4.7)	9.8 (0.03)
Uzbekistan	54 (1.4)	463 (3.1)	24 (0.9)	448 (3.8)	22 (1.1)	404 (4.0)	10.0 (0.07)
International Average	53 (0.2)	520 (0.5)	31 (0.1)	504 (0.5)	15 (0.1)	461 (0.7)	
Benchmarking Participants							
Ontario, Canada	49 (1.6)	516 (3.8)	37 (1.0)	507 (4.0)	14 (0.9)	468 (5.5)	9.7 (0.06)
Quebec, Canada	49 (1.2)	529 (3.1)	40 (1.0)	512 (3.0)	12 (0.7)	474 (5.3)	9.8 (0.04)
Abu Dhabi, UAE	38 (0.8)	498 (2.8)	32 (0.6)	470 (2.8)	30 (0.8)	415 (2.9)	9.2 (0.04)
Dubai, UAE	52 (0.8)	572 (1.8)	33 (0.6)	557 (2.6)	15 (0.6)	516 (4.4)	9.9 (0.04)
Sharjah, UAE	53 (1.7)	527 (3.4)	28 (1.2)	498 (3.5)	19 (1.1)	462 (5.6)	10.0 (0.08)

This TIMSS context questionnaire scale was established in 2019 based on the combined response distribution of countries that participated in TIMSS 2019. To provide a point of reference for country comparisons, the scale centerpoint of 10 was located at the mean of the combined distribution. The units of the scale were chosen so that 2 scale score points corresponded to the standard deviation of the distribution.

() Standard errors appear in parentheses. Because of rounding some results may appear inconsistent.

An "r" indicates data are available for at least 70% but less than 85% of the students.

SOURCE: IEA's Trends in International Mathematics and Science Study - TIMSS 2023
Downloaded from <https://timss2023.org/results>



TIMSS & PIRLS
BOSTON COLLEGE

Exhibit 6.1.8: Student Bullying

Country	Never or Almost Never		About Monthly		About Weekly		Average Scale Score
	Percent of Students	Average Achievement	Percent of Students	Average Achievement	Percent of Students	Average Achievement	
Albania	79 (1.4)	503 (4.4)	13 (1.1)	483 (7.4)	8 (1.1)	444 (10.1)	11.1 (0.09)
Armenia	73 (1.2)	471 (2.3)	14 (0.7)	449 (4.3)	13 (0.8)	429 (4.5)	10.9 (0.06)
Australia	48 (1.0)	562 (2.7)	39 (0.8)	554 (2.8)	13 (0.7)	518 (5.6)	9.7 (0.04)
Azerbaijan	53 (1.2)	446 (3.6)	27 (0.8)	425 (3.6)	20 (0.8)	386 (5.3)	10.0 (0.05)
Bahrain	43 (1.3)	507 (5.0)	29 (0.9)	481 (5.1)	28 (1.2)	432 (5.1)	9.4 (0.06)
Belgium (Flemish)	50 (1.1)	503 (2.8)	40 (1.1)	489 (2.5)	11 (0.6)	441 (5.4)	9.8 (0.03)
Belgium (French)	38 (1.0)	497 (2.8)	44 (0.9)	485 (3.2)	18 (0.9)	445 (4.6)	9.4 (0.04)
Bosnia & Herzegovina	58 (1.3)	469 (2.9)	22 (1.1)	451 (6.8)	20 (1.7)	413 (6.9)	10.1 (0.09)
Brazil	48 (1.0)	459 (3.8)	28 (0.8)	443 (4.4)	24 (0.8)	387 (4.5)	9.7 (0.04)
Bulgaria	52 (1.7)	545 (5.8)	35 (1.2)	529 (5.0)	12 (1.0)	476 (10.3)	9.9 (0.07)
Canada	49 (0.9)	537 (2.2)	37 (0.6)	519 (2.2)	13 (0.5)	485 (3.6)	9.8 (0.03)
Chile	52 (1.2)	498 (2.7)	30 (1.0)	488 (3.8)	18 (0.8)	428 (4.3)	9.8 (0.05)
Chinese Taipei	65 (0.8)	579 (1.8)	28 (0.7)	568 (2.4)	7 (0.5)	543 (5.0)	10.5 (0.03)
Cyprus	53 (1.0)	504 (3.2)	32 (0.8)	483 (3.6)	15 (0.8)	443 (5.3)	10.0 (0.05)
Czech Republic	57 (1.1)	538 (2.5)	34 (0.9)	520 (2.9)	9 (0.5)	482 (4.5)	10.2 (0.04)
Denmark	49 (1.1)	535 (2.8)	42 (0.9)	520 (3.0)	10 (0.6)	478 (5.0)	9.7 (0.04)
England	51 (1.4)	569 (3.4)	38 (1.1)	557 (3.3)	12 (0.7)	520 (5.5)	9.8 (0.05)
Finland	71 (0.9)	552 (2.7)	24 (0.8)	537 (4.1)	6 (0.4)	476 (7.8)	10.6 (0.04)
France	66 (1.1)	503 (2.9)	26 (1.0)	478 (5.1)	8 (0.5)	425 (5.9)	10.5 (0.04)
Georgia	69 (1.2)	481 (3.4)	18 (0.9)	464 (4.8)	13 (0.7)	417 (4.9)	10.7 (0.06)
Germany	47 (0.8)	540 (2.9)	40 (0.7)	513 (3.7)	13 (0.6)	456 (5.2)	9.7 (0.03)
Hong Kong SAR	64 (1.1)	555 (3.4)	26 (1.0)	548 (6.5)	9 (0.7)	483 (9.7)	10.4 (0.04)
Hungary	52 (1.1)	535 (3.4)	36 (0.8)	529 (3.8)	11 (0.8)	478 (6.8)	9.9 (0.05)
Iran, Islamic Rep. of	44 (1.2)	455 (4.3)	37 (1.0)	437 (4.9)	20 (0.9)	387 (7.3)	9.6 (0.05)
Ireland	65 (1.1)	543 (3.2)	27 (0.9)	524 (3.7)	8 (0.6)	472 (9.2)	10.4 (0.05)
Italy	47 (1.0)	522 (2.6)	39 (0.9)	513 (3.1)	14 (0.7)	473 (4.1)	9.7 (0.04)
Japan	73 (1.4)	559 (2.4)	24 (1.2)	551 (3.2)	3 (0.4)	512 (9.6)	10.9 (0.06)
Jordan	52 (2.1)	439 (6.0)	23 (1.1)	414 (7.5)	25 (1.6)	387 (5.4)	9.9 (0.10)
Kazakhstan	46 (1.1)	487 (3.7)	35 (0.9)	471 (3.7)	19 (0.8)	426 (5.3)	9.7 (0.05)
Korea, Rep. of	73 (1.0)	588 (2.4)	23 (0.9)	573 (4.1)	4 (0.4)	560 (10.0)	10.9 (0.04)
Kosovo	58 (1.3)	418 (3.4)	24 (0.8)	406 (4.8)	17 (1.0)	363 (6.0)	10.2 (0.06)
Kuwait	41 (1.5)	415 (6.3)	32 (1.1)	392 (6.3)	28 (1.4)	321 (6.9)	9.4 (0.08)
Latvia	36 (1.3)	545 (2.9)	41 (1.1)	531 (3.6)	22 (1.0)	490 (4.6)	9.2 (0.05)
Lithuania	46 (1.3)	553 (2.8)	36 (1.1)	541 (3.1)	18 (0.8)	495 (4.5)	9.5 (0.05)
Macao SAR	51 (0.7)	550 (1.8)	37 (0.6)	529 (1.9)	12 (0.4)	495 (3.9)	9.9 (0.02)
Montenegro	65 (1.0)	482 (1.9)	18 (0.7)	456 (3.6)	18 (0.8)	415 (3.2)	10.5 (0.05)
Morocco	43 (1.6)	425 (6.8)	40 (1.3)	383 (5.7)	18 (1.1)	331 (6.3)	9.6 (0.06)
Netherlands	60 (1.4)	525 (2.6)	32 (1.1)	517 (3.7)	8 (0.7)	466 (7.2)	10.2 (0.05)
New Zealand	41 (1.1)	536 (3.6)	41 (0.8)	525 (2.6)	18 (0.9)	478 (4.8)	9.4 (0.04)
North Macedonia	52 (1.3)	465 (3.8)	25 (1.0)	451 (4.3)	23 (1.0)	407 (5.2)	9.8 (0.06)
Norway (5)	63 (1.0)	539 (2.8)	31 (0.9)	529 (3.0)	6 (0.4)	492 (5.7)	10.3 (0.04)
Oman	33 (1.1)	472 (6.6)	30 (0.8)	439 (4.0)	37 (1.1)	404 (4.4)	8.9 (0.06)
Poland	62 (1.1)	559 (2.1)	30 (0.9)	545 (3.1)	9 (0.5)	506 (4.8)	10.3 (0.04)
Portugal	48 (1.2)	520 (2.3)	39 (0.9)	515 (2.7)	13 (0.7)	468 (4.5)	9.7 (0.04)
Qatar	40 (1.1)	505 (4.2)	32 (0.9)	483 (4.4)	28 (0.9)	428 (4.7)	9.3 (0.05)
Romania	55 (1.4)	544 (4.7)	30 (1.1)	535 (4.6)	15 (1.1)	491 (6.9)	9.9 (0.06)
Saudi Arabia	46 (1.1)	471 (4.4)	24 (0.7)	427 (4.5)	30 (1.0)	392 (4.2)	9.5 (0.06)
Serbia	67 (1.3)	523 (2.8)	22 (1.0)	503 (4.0)	11 (0.8)	467 (6.3)	10.5 (0.06)
Singapore	53 (0.8)	623 (2.3)	35 (0.7)	602 (3.4)	12 (0.5)	557 (5.7)	9.9 (0.03)
Slovak Republic	60 (1.4)	529 (3.6)	31 (1.1)	522 (4.4)	9 (0.6)	480 (6.5)	10.3 (0.05)
Slovenia	60 (0.9)	540 (2.3)	28 (0.7)	526 (3.6)	13 (0.7)	475 (4.5)	10.2 (0.04)
South Africa (5)	25 (1.1)	374 (9.7)	46 (0.9)	308 (5.0)	29 (1.1)	248 (5.1)	8.9 (0.04)
Spain	52 (0.9)	516 (2.0)	36 (0.7)	505 (2.7)	13 (0.6)	463 (3.9)	9.9 (0.03)
Sweden	63 (1.1)	546 (2.9)	30 (0.9)	524 (3.9)	7 (0.5)	474 (8.2)	10.3 (0.04)
Türkiye (5)	43 (1.1)	588 (3.1)	41 (0.9)	570 (3.9)	16 (0.7)	526 (5.2)	9.6 (0.04)
United Arab Emirates	47 (0.5)	532 (2.0)	30 (0.4)	502 (2.5)	23 (0.4)	432 (2.6)	9.7 (0.03)
United States	51 (0.9)	552 (2.8)	34 (0.7)	536 (3.4)	14 (0.6)	482 (4.6)	9.8 (0.03)
Uzbekistan	54 (1.4)	434 (3.5)	24 (0.9)	416 (4.1)	22 (1.1)	367 (4.5)	10.0 (0.07)
International Average	53 (0.2)	513 (0.5)	31 (0.1)	495 (0.5)	15 (0.1)	450 (0.8)	
Benchmarking Participants							
Ontario, Canada	49 (1.6)	540 (3.6)	37 (1.0)	527 (3.9)	14 (0.9)	495 (5.4)	9.7 (0.06)
Quebec, Canada	49 (1.2)	523 (2.8)	40 (1.0)	504 (2.7)	12 (0.7)	466 (5.1)	9.8 (0.04)
Abu Dhabi, UAE	38 (0.8)	496 (3.6)	32 (0.6)	460 (4.0)	30 (0.8)	390 (3.2)	9.2 (0.04)
Dubai, UAE	52 (0.8)	581 (2.2)	33 (0.6)	563 (3.2)	15 (0.6)	516 (4.0)	9.9 (0.04)
Sharjah, UAE	53 (1.7)	531 (4.1)	28 (1.2)	501 (4.0)	19 (1.1)	449 (5.9)	10.0 (0.08)

This TIMSS context questionnaire scale was established in 2019 based on the combined response distribution of countries that participated in TIMSS 2019. To provide a point of reference for country comparisons, the scale centerpoint of 10 was located at the mean of the combined distribution. The units of the scale were chosen so that 2 scale score points corresponded to the standard deviation of the distribution.

() Standard errors appear in parentheses. Because of rounding some results may appear inconsistent.

An "r" indicates data are available for at least 70% but less than 85% of the students.

SOURCE: IEA's Trends in International Mathematics and Science Study - TIMSS 2023

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TIMSS & PIRLS
BOSTON COLLEGE

Student Bullying (Grade 8)

There is a strong negative relationship between frequent experience of bullying behaviors and average achievement in mathematics and science for eighth-grade students. Even reporting occasional experiences of bullying is associated with lower average achievement, but to a lesser degree than reporting frequent experiences of bullying. The TIMSS 2023 eighth-grade *Student Bullying* scale (Exhibit 6.1.9) classified students based on their reports of how frequently they experienced different forms of bullying within the past school year. Students were classified as reporting being bullied “never or almost never,” “about monthly,” or “about weekly.”

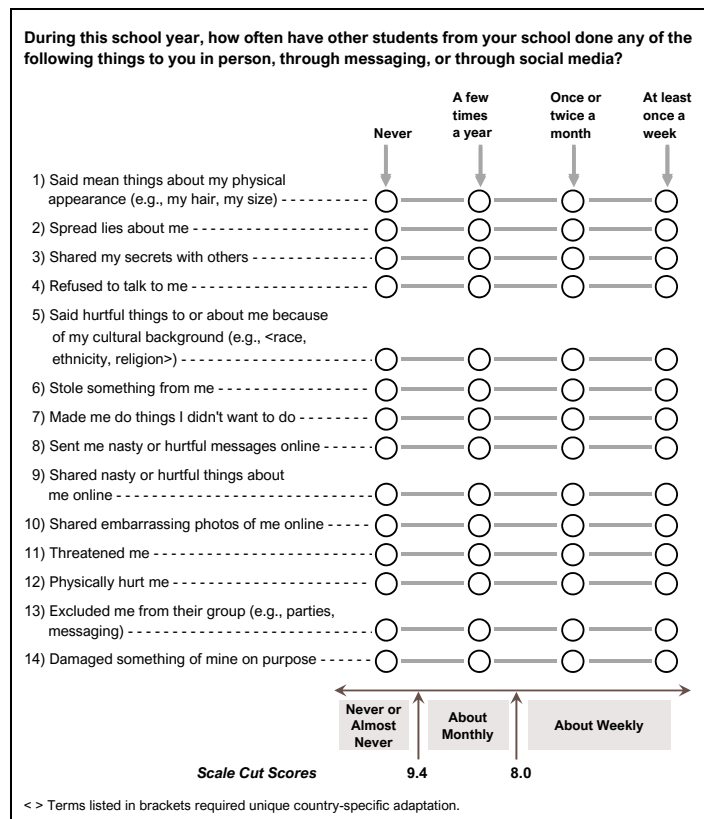
On average, more than half of eighth-grade students were classified as “never or almost never” being bullied (60%). Twenty-seven percent of students were classified as being bullied “about monthly” and the remaining 13 percent of students were classified as being bullied “about weekly.” Although there is variation across individual countries, 50 percent or more of eighth-grade students in most countries were classified as being bullied “never or almost never.” Eight countries had 20 percent or more of students classified as being bullied “about weekly” and 16 countries had less than 10 percent of students in this category.

Average achievement for students in each of the scale categories is presented in Exhibits 6.1.10 and 6.1.11 for mathematics and science, respectively. Students classified as being bullied “never or almost never” had the highest average achievement in both mathematics and science (487 and 488, respectively). Students classified as being bullied “about weekly” had much lower average achievement in both subjects (429 for mathematics and 420 for science). Average achievement for students classified as being bullied “about monthly” was in between: 472 for mathematics and 471 for science.

Exhibit 6.1.9: Student Bullying

About the Scale

Students were scored according to their reports regarding fourteen bullying behaviors on the *Student Bullying* scale. Cut scores divide the scale into three categories. Students bullied **Never or Almost Never** had a score at or above the cut score corresponding to reporting that they “never” experienced seven of the fourteen bullying behaviors and experienced the other seven “a few times a year,” on average. Students bullied **About Weekly** had a score at or below the cut score corresponding to reporting that they experienced seven of the fourteen behaviors “once or twice a month” and the other seven “a few times a year,” on average. All other students were bullied **About Monthly**.



SOURCE: IEA's Trends in International Mathematics and Science Study - TIMSS 2023
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Exhibit 6.1.10: Student Bullying

Country	Never or Almost Never		About Monthly		About Weekly		Average Scale Score
	Percent of Students	Average Achievement	Percent of Students	Average Achievement	Percent of Students	Average Achievement	
Australia	48 (0.9)	525 (3.8)	36 (0.8)	514 (3.7)	16 (0.6)	478 (5.4)	9.5 (0.03)
Austria	61 (1.0)	521 (2.7)	30 (0.8)	510 (2.6)	8 (0.6)	475 (5.8)	9.9 (0.03)
Azerbaijan	60 (1.2)	502 (3.6)	23 (0.9)	474 (5.6)	17 (0.8)	450 (6.5)	10.0 (0.06)
Bahrain	55 (0.9)	451 (2.5)	26 (0.7)	427 (3.9)	18 (0.8)	381 (4.7)	9.7 (0.04)
Brazil	43 (0.7)	403 (4.5)	34 (0.6)	386 (3.4)	23 (0.6)	346 (2.8)	9.2 (0.03)
Chile	54 (0.9)	429 (3.1)	33 (0.8)	417 (3.6)	14 (0.7)	383 (4.8)	9.6 (0.03)
Chinese Taipei	85 (0.7)	606 (3.1)	13 (0.6)	590 (5.9)	2 ~	~ ~	11.3 (0.04)
Cote d'Ivoire	45 (1.3)	269 (6.1)	39 (0.9)	268 (5.1)	16 (0.9)	236 (4.4)	9.4 (0.05)
Cyprus	60 (0.9)	509 (3.0)	26 (0.7)	498 (3.7)	13 (0.6)	457 (3.8)	9.9 (0.04)
Czech Republic	64 (0.7)	529 (2.3)	29 (0.6)	509 (2.9)	7 (0.4)	475 (4.9)	10.0 (0.03)
England	55 (1.0)	538 (4.8)	33 (0.7)	528 (5.6)	12 (0.7)	487 (6.2)	9.8 (0.04)
Finland	76 (0.8)	514 (2.6)	18 (0.6)	500 (3.2)	7 (0.5)	451 (5.3)	10.7 (0.04)
France	66 (0.9)	492 (3.1)	26 (0.7)	470 (4.0)	8 (0.6)	434 (5.4)	10.1 (0.03)
Georgia	81 (0.8)	476 (3.4)	11 (0.7)	462 (5.2)	7 (0.6)	433 (7.7)	11.1 (0.05)
Hong Kong SAR	66 (1.4)	580 (4.9)	23 (0.9)	581 (7.4)	10 (0.9)	541 (7.8)	10.3 (0.06)
Hungary	67 (1.0)	516 (3.5)	27 (0.8)	497 (4.4)	7 (0.5)	453 (7.5)	10.1 (0.03)
Iran, Islamic Rep. of	57 (1.0)	439 (3.8)	29 (0.7)	420 (3.7)	14 (0.9)	372 (6.8)	9.7 (0.04)
Ireland	67 (0.8)	528 (2.6)	25 (0.6)	519 (3.7)	9 (0.5)	500 (6.3)	10.2 (0.03)
Italy	66 (0.9)	507 (2.9)	28 (0.8)	499 (4.1)	6 (0.4)	459 (6.6)	10.0 (0.03)
Japan	91 (0.6)	596 (3.3)	8 (0.5)	592 (5.2)	1 ~	~ ~	11.5 (0.04)
Jordan	52 (1.1)	413 (3.4)	23 (0.7)	388 (3.7)	26 (1.0)	353 (4.7)	9.5 (0.05)
Kazakhstan	68 (0.9)	462 (3.6)	23 (0.7)	447 (4.2)	9 (0.5)	429 (5.4)	10.4 (0.04)
Korea, Rep. of	82 (0.7)	600 (3.1)	16 (0.6)	591 (4.3)	3 (0.3)	536 (13.0)	11.0 (0.03)
Kuwait	60 (1.0)	407 (5.0)	27 (0.9)	406 (6.3)	13 (0.8)	366 (10.5)	10.0 (0.04)
Lithuania	63 (0.9)	523 (3.4)	26 (0.7)	516 (3.4)	11 (0.6)	472 (6.1)	10.0 (0.04)
Malaysia	44 (0.9)	426 (3.7)	39 (0.7)	411 (3.4)	17 (0.7)	375 (4.2)	9.4 (0.03)
Malta	54 (0.7)	515 (1.9)	33 (0.7)	503 (2.4)	12 (0.6)	459 (4.0)	9.7 (0.03)
Morocco	40 (1.0)	392 (3.2)	35 (0.7)	375 (3.2)	25 (0.9)	366 (4.4)	9.1 (0.04)
Norway (9)	70 (1.0)	512 (2.3)	22 (0.7)	496 (3.1)	8 (0.5)	462 (4.7)	10.3 (0.05)
Oman	45 (0.8)	437 (2.8)	31 (0.7)	415 (3.5)	24 (0.6)	370 (3.7)	9.3 (0.03)
Palestinian Nat'l Auth.	51 (1.0)	407 (3.3)	25 (0.6)	380 (3.3)	24 (1.0)	355 (4.1)	9.5 (0.05)
Portugal	64 (1.0)	485 (2.5)	29 (0.9)	470 (3.8)	8 (0.4)	435 (5.0)	10.0 (0.03)
Qatar	58 (1.2)	462 (4.8)	26 (1.1)	465 (5.7)	16 (0.8)	412 (5.5)	9.8 (0.05)
Romania	49 (1.3)	520 (4.8)	29 (1.1)	502 (5.4)	22 (1.2)	459 (7.6)	9.4 (0.06)
Saudi Arabia	65 (0.9)	413 (3.2)	18 (0.6)	396 (4.7)	17 (0.7)	364 (4.4)	10.2 (0.05)
Singapore	62 (1.2)	620 (5.6)	29 (0.8)	592 (7.2)	9 (0.7)	552 (9.2)	10.0 (0.05)
South Africa (9)	30 (0.8)	422 (4.2)	48 (0.7)	395 (3.0)	22 (0.7)	361 (4.0)	8.9 (0.03)
Sweden	71 (1.1)	531 (2.5)	22 (1.0)	511 (3.6)	7 (0.5)	471 (5.1)	10.4 (0.04)
Türkiye	47 (1.1)	525 (5.1)	39 (0.9)	506 (4.8)	14 (0.7)	466 (6.6)	9.4 (0.04)
United Arab Emirates	54 (0.5)	514 (2.1)	26 (0.4)	495 (2.0)	20 (0.4)	437 (2.3)	9.7 (0.03)
United States	56 (0.9)	503 (4.5)	31 (0.7)	492 (3.7)	14 (0.6)	447 (5.5)	9.8 (0.04)
Uzbekistan	65 (1.2)	432 (5.0)	20 (0.8)	415 (4.5)	15 (0.9)	396 (4.7)	10.2 (0.06)
International Average	60 (0.1)	487 (0.6)	27 (0.1)	472 (0.7)	13 (0.1)	429 (1.0)	
Israel	- -	- -	- -	- -	- -	- -	- -
Benchmarking Participants							
Abu Dhabi, UAE	46 (0.9)	489 (2.8)	27 (0.5)	468 (3.1)	27 (0.9)	409 (3.1)	9.3 (0.05)
Dubai, UAE	59 (0.9)	565 (2.9)	28 (0.7)	542 (3.2)	13 (0.7)	491 (5.1)	10.0 (0.04)
Sharjah, UAE	60 (1.5)	511 (6.2)	23 (1.1)	496 (4.8)	17 (0.9)	453 (5.0)	10.0 (0.08)

This TIMSS context questionnaire scale was established in 2019 based on the combined response distribution of countries that participated in TIMSS 2019. To provide a point of reference for country comparisons, the scale centerpoint of 10 was located at the mean of the combined distribution. The units of the scale were chosen so that 2 scale score points corresponded to the standard deviation of the distribution.

() Standard errors appear in parentheses. Because of rounding some results may appear inconsistent.

A dash (-) indicates comparable data not available. A tilde (~) indicates insufficient data to report result.

SOURCE: IEA's Trends in International Mathematics and Science Study - TIMSS 2023
Downloaded from <https://timss2023.org/results>

Exhibit 6.1.11: Student Bullying

Country	Never or Almost Never		About Monthly		About Weekly		Average Scale Score
	Percent of Students	Average Achievement	Percent of Students	Average Achievement	Percent of Students	Average Achievement	
Australia	48 (0.9)	536 (3.5)	36 (0.8)	529 (3.2)	16 (0.6)	484 (5.9)	9.5 (0.03)
Austria	61 (1.0)	521 (2.8)	30 (0.8)	510 (3.0)	8 (0.6)	469 (5.8)	9.9 (0.03)
Azerbaijan	60 (1.2)	430 (3.1)	23 (0.9)	414 (5.0)	17 (0.8)	388 (4.7)	10.0 (0.06)
Bahrain	55 (0.9)	484 (2.7)	26 (0.7)	454 (4.0)	18 (0.8)	386 (4.7)	9.7 (0.04)
Brazil	43 (0.7)	446 (3.8)	34 (0.6)	430 (2.8)	23 (0.6)	384 (2.8)	9.2 (0.03)
Chile	54 (0.9)	470 (2.6)	33 (0.8)	456 (3.4)	14 (0.7)	419 (4.5)	9.6 (0.03)
Chinese Taipei	85 (0.7)	575 (2.5)	13 (0.6)	562 (4.8)	2 ~	~ ~	11.3 (0.04)
Cote d'Ivoire	45 (1.3)	195 (9.8)	39 (0.9)	188 (8.3)	16 (0.9)	139 (8.2)	9.4 (0.05)
Cyprus	60 (0.9)	479 (3.5)	26 (0.7)	470 (3.9)	13 (0.6)	423 (5.0)	9.9 (0.04)
Czech Republic	64 (0.7)	537 (2.1)	29 (0.6)	518 (2.6)	7 (0.4)	491 (4.9)	10.0 (0.03)
England	55 (1.0)	545 (4.6)	33 (0.7)	535 (5.4)	12 (0.7)	491 (6.2)	9.8 (0.04)
Finland	76 (0.8)	545 (2.9)	18 (0.6)	527 (4.3)	7 (0.5)	460 (6.8)	10.7 (0.04)
France	66 (0.9)	500 (3.1)	26 (0.7)	479 (3.8)	8 (0.6)	441 (6.6)	10.1 (0.03)
Georgia	81 (0.8)	458 (2.9)	11 (0.7)	445 (5.8)	7 (0.6)	408 (8.7)	11.1 (0.05)
Hong Kong SAR	66 (1.4)	537 (4.5)	23 (0.9)	530 (7.3)	10 (0.9)	478 (7.8)	10.3 (0.06)
Hungary	67 (1.0)	530 (3.1)	27 (0.8)	514 (4.0)	7 (0.5)	475 (7.0)	10.1 (0.03)
Iran, Islamic Rep. of	57 (1.0)	438 (3.6)	29 (0.7)	417 (3.6)	14 (0.9)	353 (7.5)	9.7 (0.04)
Ireland	67 (0.8)	532 (3.0)	25 (0.6)	526 (5.5)	9 (0.5)	496 (6.7)	10.2 (0.03)
Italy	66 (0.9)	506 (3.1)	28 (0.8)	502 (3.8)	6 (0.4)	449 (6.4)	10.0 (0.03)
Japan	91 (0.6)	559 (3.1)	8 (0.5)	559 (5.7)	1 ~	~ ~	11.5 (0.04)
Jordan	52 (1.1)	447 (3.8)	23 (0.7)	411 (3.9)	26 (1.0)	363 (5.0)	9.5 (0.05)
Kazakhstan	68 (0.9)	451 (3.2)	23 (0.7)	435 (3.4)	9 (0.5)	412 (4.8)	10.4 (0.04)
Korea, Rep. of	82 (0.7)	550 (2.3)	16 (0.6)	535 (3.8)	3 (0.3)	473 (11.3)	11.0 (0.03)
Kuwait	60 (1.0)	436 (5.1)	27 (0.9)	425 (6.9)	13 (0.8)	367 (8.8)	10.0 (0.04)
Lithuania	63 (0.9)	529 (3.1)	26 (0.7)	522 (3.2)	11 (0.6)	472 (6.2)	10.0 (0.04)
Malaysia	44 (0.9)	448 (3.6)	39 (0.7)	430 (3.5)	17 (0.7)	368 (4.9)	9.4 (0.03)
Malta	54 (0.7)	518 (2.1)	33 (0.7)	507 (2.8)	12 (0.6)	456 (4.9)	9.7 (0.03)
Morocco	40 (1.0)	340 (3.7)	35 (0.7)	323 (3.6)	25 (0.9)	317 (5.0)	9.1 (0.04)
Norway (9)	70 (1.0)	503 (2.5)	22 (0.7)	484 (3.8)	8 (0.5)	432 (5.2)	10.3 (0.05)
Oman	45 (0.8)	492 (2.7)	31 (0.7)	462 (3.3)	24 (0.6)	403 (3.6)	9.3 (0.03)
Palestinian Nat'l Auth.	51 (1.0)	427 (3.1)	25 (0.6)	392 (3.5)	24 (1.0)	350 (4.0)	9.5 (0.05)
Portugal	64 (1.0)	516 (2.2)	29 (0.9)	499 (3.4)	8 (0.4)	462 (4.8)	10.0 (0.03)
Qatar	58 (1.2)	498 (4.8)	26 (1.1)	490 (5.9)	16 (0.8)	429 (5.2)	9.8 (0.05)
Romania	49 (1.3)	490 (3.7)	29 (1.1)	476 (3.9)	22 (1.2)	431 (7.0)	9.4 (0.06)
Saudi Arabia	65 (0.9)	443 (3.3)	18 (0.6)	421 (4.8)	17 (0.7)	369 (4.7)	10.2 (0.05)
Singapore	62 (1.2)	622 (5.0)	29 (0.8)	593 (6.9)	9 (0.7)	546 (8.8)	10.0 (0.05)
South Africa (9)	30 (0.8)	404 (5.3)	48 (0.7)	359 (3.8)	22 (0.7)	307 (4.8)	8.9 (0.03)
Sweden	71 (1.1)	536 (3.0)	22 (1.0)	519 (4.2)	7 (0.5)	473 (6.9)	10.4 (0.04)
Türkiye	47 (1.1)	542 (4.1)	39 (0.9)	530 (3.9)	14 (0.7)	491 (6.1)	9.4 (0.04)
United Arab Emirates	54 (0.5)	520 (2.3)	26 (0.4)	498 (2.3)	20 (0.4)	415 (2.5)	9.7 (0.03)
United States	56 (0.9)	529 (4.0)	31 (0.7)	518 (3.6)	14 (0.6)	472 (5.4)	9.8 (0.04)
Uzbekistan	65 (1.2)	409 (3.9)	20 (0.8)	394 (4.6)	15 (0.9)	360 (5.4)	10.2 (0.06)
International Average	60 (0.1)	488 (0.6)	27 (0.1)	471 (0.7)	13 (0.1)	420 (1.0)	
Israel	- -	- -	- -	- -	- -	- -	- -
Benchmarking Participants							
Abu Dhabi, UAE	46 (0.9)	492 (3.9)	27 (0.5)	467 (3.6)	27 (0.9)	378 (3.7)	9.3 (0.05)
Dubai, UAE	59 (0.9)	569 (3.1)	28 (0.7)	546 (3.7)	13 (0.7)	481 (5.2)	10.0 (0.04)
Sharjah, UAE	60 (1.5)	520 (6.2)	23 (1.1)	500 (5.3)	17 (0.9)	438 (4.1)	10.0 (0.08)

This TIMSS context questionnaire scale was established in 2019 based on the combined response distribution of countries that participated in TIMSS 2019. To provide a point of reference for country comparisons, the scale centerpoint of 10 was located at the mean of the combined distribution. The units of the scale were chosen so that 2 scale score points corresponded to the standard deviation of the distribution.

() Standard errors appear in parentheses. Because of rounding some results may appear inconsistent.
A dash (-) indicates comparable data not available. A tilde (~) indicates insufficient data to report result.

SOURCE: IEA's Trends in International Mathematics and Science Study - TIMSS 2023
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Frequency of Student Absences

Regular school attendance provides students with opportunities to learn and is associated with higher average mathematics and science achievement for fourth- and eighth-grade students. In particular, students who reported being absent on a weekly basis had much lower average achievement in both grades and subjects compared to students who were absent less frequently. The TIMSS 2023 Student Questionnaire asked students to report on their frequency of absence from school; students could choose “never or almost never,” “once every two months,” “once a month,” “once every two weeks,” or “once a week” (Exhibit 6.1.12).

In the fourth grade, a little more than half of the students (55%) reported being absent “never or almost never,” on average internationally (Exhibit 6.1.13 – 6.1.14). Thirteen percent reported absences “once every two months,” 12 percent reported absences “once a month,” 7 percent reported absences “once every two weeks,” and 13 percent reported absences “once a week.” In both subjects, average achievement differences are very small for fourth-grade students who reported being absent “never or almost never” or “once every two months.” Average achievement decreases as the frequency of reported absence increases. There is a 65-point difference in average mathematics achievement internationally between students who reported being absent “never or almost never” and those who reported being absent “once a week” (516 vs. 451). There is a corresponding 66-point difference in average achievement in science (508 vs. 442).

On average internationally, a little less than half of eighth-grade students (46%) reported being absent “never or almost never” (Exhibits 6.1.15 – 6.1.16). Sixteen percent reported absences “once every two months,” 16 percent reported absences “once a month,” 10 percent reported absences “once every two weeks,” and 12 percent reported absences “once a week.” Internationally, there is an 82-point difference in average mathematics achievement between students who reported “never or almost never” being absent and those who reported being absent “once a week” (488 vs. 406). There is also an 82-point difference in average science achievement internationally between these groups of students (487 vs. 405).

Exhibit 6.1.12: Frequency of Student Absences

About the Item	
About how often are you absent from school?	
Once a week - - -	☐
Once every two weeks - - -	☐
Once a month - - -	☐
Once every two months - - -	☐
Never or almost never - - -	☐

SOURCE: IEA's Trends in International Mathematics and Science Study - TIMSS 2023
Downloaded from <https://timss2023.org/results>

 IEA TIMSS & PIRLS
BOSTON COLLEGE

Exhibit 6.1.13: Frequency of Student Absences

Country	Never or Almost Never		Once Every Two Months		Once a Month		Once Every Two Weeks		Once a Week	
	Percent of Students	Average Achievement	Percent of Students	Average Achievement	Percent of Students	Average Achievement	Percent of Students	Average Achievement	Percent of Students	Average Achievement
Albania	60 (1.8)	523 (5.1)	12 (1.0)	526 (9.6)	10 (0.9)	514 (7.8)	4 (0.5)	485 (13.5)	15 (1.1)	472 (7.2)
Armenia	41 (1.0)	526 (2.9)	11 (0.8)	528 (4.1)	15 (0.6)	510 (4.6)	9 (0.5)	506 (4.7)	24 (0.9)	488 (3.7)
Australia	54 (1.2)	539 (3.0)	16 (0.7)	534 (4.5)	15 (0.7)	528 (4.6)	7 (0.5)	503 (7.6)	7 (0.5)	452 (5.6)
Azerbaijan	40 (1.0)	513 (3.8)	14 (0.7)	514 (5.6)	14 (0.6)	491 (5.9)	9 (0.5)	467 (7.1)	24 (0.7)	469 (4.1)
Bahrain	55 (1.2)	480 (4.4)	10 (0.6)	466 (7.1)	10 (0.5)	445 (6.4)	8 (0.4)	440 (7.9)	18 (0.7)	425 (5.4)
Belgium (Flemish)	73 (0.9)	531 (2.2)	10 (0.4)	519 (4.0)	7 (0.6)	507 (6.2)	3 (0.3)	478 (7.2)	7 (0.5)	478 (5.0)
Belgium (French)	73 (0.9)	498 (2.5)	8 (0.5)	490 (4.8)	5 (0.4)	483 (6.7)	6 (0.3)	475 (6.6)	9 (0.6)	437 (5.1)
Bosnia & Herzegovina	52 (1.1)	459 (3.4)	14 (1.1)	468 (5.3)	10 (0.6)	447 (5.4)	7 (0.9)	422 (8.4)	17 (1.1)	407 (6.0)
Brazil	53 (0.8)	419 (3.9)	7 (0.5)	410 (7.5)	10 (0.4)	386 (7.9)	9 (0.5)	384 (6.1)	21 (0.7)	369 (3.5)
Bulgaria	50 (1.4)	545 (3.8)	16 (0.8)	545 (5.2)	15 (0.8)	535 (6.1)	7 (0.5)	498 (6.8)	12 (0.8)	460 (7.8)
Canada	57 (0.6)	512 (2.3)	13 (0.4)	513 (3.2)	14 (0.4)	516 (3.3)	7 (0.3)	493 (4.0)	9 (0.4)	446 (3.9)
Chile	58 (0.7)	454 (2.4)	7 (0.4)	450 (6.6)	8 (0.5)	456 (6.5)	8 (0.5)	429 (6.1)	18 (0.6)	416 (4.7)
Chinese Taipei	73 (0.8)	614 (1.8)	15 (0.6)	603 (3.2)	5 (0.3)	597 (5.1)	2 ~	~	5 (0.3)	550 (5.6)
Cyprus	68 (1.0)	525 (2.6)	13 (0.6)	521 (4.7)	9 (0.5)	512 (4.0)	4 (0.4)	490 (7.6)	6 (0.4)	447 (6.0)
Czech Republic	32 (0.9)	536 (3.0)	24 (0.8)	538 (3.1)	20 (0.6)	543 (3.1)	12 (0.6)	526 (5.0)	11 (0.6)	486 (4.2)
Denmark	46 (1.0)	533 (2.7)	16 (0.6)	530 (3.7)	18 (0.6)	526 (3.0)	9 (0.5)	512 (3.9)	11 (0.6)	491 (4.4)
England	65 (1.2)	562 (3.2)	15 (0.9)	559 (4.8)	10 (0.5)	552 (5.6)	4 (0.4)	514 (7.7)	5 (0.5)	454 (8.5)
Finland	28 (0.7)	532 (2.8)	32 (0.7)	538 (2.8)	25 (0.6)	538 (3.5)	9 (0.4)	517 (5.1)	6 (0.4)	463 (6.4)
France	75 (0.8)	493 (2.9)	9 (0.4)	480 (5.6)	7 (0.5)	472 (5.7)	3 (0.2)	443 (7.9)	6 (0.5)	432 (6.8)
Georgia	40 (1.1)	515 (3.5)	12 (0.7)	505 (5.1)	13 (0.8)	510 (5.2)	10 (0.7)	479 (6.8)	25 (0.9)	472 (4.2)
Germany	63 (0.9)	532 (2.3)	11 (0.6)	531 (4.4)	12 (0.5)	527 (6.2)	5 (0.4)	502 (7.1)	9 (0.5)	484 (4.6)
Hong Kong SAR	75 (1.0)	606 (3.9)	12 (0.7)	586 (4.4)	5 (0.3)	585 (13.8)	3 (0.3)	525 (11.1)	5 (0.4)	495 (7.8)
Hungary	33 (1.0)	541 (3.3)	25 (0.8)	532 (4.9)	21 (0.8)	526 (5.1)	10 (0.6)	503 (6.4)	11 (0.7)	449 (7.7)
Iran, Islamic Rep. of	47 (1.3)	435 (4.1)	12 (0.6)	440 (5.9)	10 (0.7)	424 (6.8)	7 (0.5)	416 (6.8)	23 (1.1)	385 (5.9)
Ireland	49 (1.1)	549 (3.3)	21 (0.8)	559 (3.5)	18 (0.9)	553 (5.1)	7 (0.5)	529 (7.3)	5 (0.5)	460 (8.8)
Italy	64 (1.1)	522 (3.1)	9 (0.5)	512 (4.7)	11 (0.5)	517 (6.0)	7 (0.5)	506 (6.5)	9 (0.5)	461 (4.8)
Japan	68 (0.9)	601 (2.1)	18 (0.8)	585 (4.0)	8 (0.5)	577 (5.7)	2 ~	~	4 (0.3)	518 (6.6)
Jordan	34 (1.2)	444 (5.1)	15 (0.9)	441 (7.1)	17 (1.0)	424 (8.6)	10 (0.7)	413 (8.1)	24 (1.0)	403 (6.0)
Kazakhstan	42 (1.1)	505 (4.1)	14 (0.5)	505 (4.4)	12 (0.5)	485 (5.1)	7 (0.4)	479 (7.7)	24 (1.0)	453 (3.9)
Korea, Rep. of	78 (0.7)	599 (2.5)	12 (0.5)	587 (5.0)	6 (0.4)	586 (5.3)	1 ~	~	2 ~	~
Kosovo	51 (1.0)	463 (3.7)	13 (0.6)	466 (5.9)	9 (0.5)	449 (7.3)	6 (0.5)	436 (8.9)	21 (0.9)	421 (5.1)
Kuwait	40 (1.1)	423 (5.1)	7 (0.5)	395 (8.3)	9 (0.7)	389 (8.1)	11 (0.6)	351 (7.4)	33 (0.9)	351 (5.5)
Latvia	48 (1.1)	541 (3.0)	16 (0.8)	549 (4.3)	13 (0.7)	551 (5.1)	8 (0.6)	520 (5.6)	15 (0.9)	498 (4.6)
Lithuania	63 (0.9)	566 (3.1)	12 (0.6)	573 (4.4)	11 (0.5)	572 (3.8)	5 (0.4)	547 (6.0)	9 (0.6)	509 (5.8)
Macao SAR	77 (0.5)	589 (1.1)	14 (0.4)	577 (2.8)	5 (0.3)	555 (6.4)	2 ~	~	3 (0.2)	497 (6.9)
Montenegro	53 (0.9)	490 (2.1)	13 (0.5)	486 (3.7)	10 (0.5)	479 (5.1)	7 (0.4)	465 (4.3)	17 (0.7)	440 (3.8)
Morocco	61 (1.3)	405 (5.1)	12 (0.8)	409 (8.4)	9 (0.6)	374 (8.7)	5 (0.4)	360 (9.8)	13 (0.7)	366 (5.7)
Netherlands	64 (1.1)	543 (2.1)	16 (0.7)	544 (4.3)	11 (0.7)	533 (4.0)	4 (0.4)	511 (7.4)	5 (0.4)	485 (7.1)
New Zealand	52 (0.9)	496 (2.9)	15 (0.6)	517 (4.8)	13 (0.6)	504 (4.8)	8 (0.4)	481 (5.4)	13 (0.6)	437 (5.6)
North Macedonia	43 (1.2)	492 (4.0)	13 (0.7)	484 (5.9)	12 (0.6)	473 (5.3)	7 (0.5)	448 (6.4)	24 (1.0)	449 (4.4)
Norway (5)	55 (0.9)	533 (2.5)	16 (0.5)	543 (4.1)	16 (0.6)	536 (2.9)	6 (0.4)	528 (4.8)	7 (0.5)	488 (5.2)
Oman	39 (0.8)	444 (4.2)	14 (0.5)	428 (5.4)	14 (0.6)	406 (5.4)	9 (0.4)	407 (7.5)	24 (0.8)	399 (4.8)
Poland	49 (1.1)	558 (2.5)	17 (0.6)	546 (3.1)	16 (0.7)	551 (4.1)	9 (0.5)	532 (4.6)	10 (0.5)	497 (4.5)
Portugal	80 (0.8)	523 (2.7)	6 (0.4)	522 (6.8)	5 (0.4)	512 (6.7)	3 (0.3)	508 (8.4)	6 (0.5)	452 (6.6)
Qatar	53 (1.2)	488 (3.5)	10 (0.5)	471 (5.5)	10 (0.5)	455 (6.8)	7 (0.4)	434 (7.5)	20 (0.8)	419 (4.9)
Romania	64 (1.3)	556 (4.5)	11 (0.7)	552 (6.2)	10 (0.7)	537 (7.5)	6 (0.6)	518 (8.1)	10 (1.1)	473 (8.2)
Saudi Arabia	35 (1.1)	449 (4.7)	8 (0.4)	416 (7.6)	10 (0.5)	411 (6.7)	13 (0.6)	397 (5.1)	33 (0.9)	404 (4.2)
Serbia	51 (1.0)	531 (3.5)	18 (0.9)	534 (5.9)	12 (0.7)	530 (5.6)	6 (0.5)	505 (6.8)	12 (0.7)	478 (6.0)
Singapore	75 (0.6)	626 (2.4)	11 (0.4)	615 (4.7)	7 (0.3)	601 (5.3)	3 (0.2)	547 (9.4)	5 (0.3)	494 (6.1)
Slovak Republic	30 (1.0)	531 (3.4)	21 (0.8)	529 (3.2)	22 (0.8)	528 (3.7)	14 (0.8)	501 (6.2)	14 (0.7)	456 (7.2)
Slovenia	58 (0.9)	521 (2.0)	14 (0.7)	527 (3.4)	12 (0.5)	516 (4.2)	6 (0.4)	497 (5.4)	10 (0.5)	468 (4.7)
South Africa (5)	52 (1.2)	385 (4.9)	9 (0.5)	361 (9.1)	9 (0.4)	348 (6.6)	7 (0.5)	320 (6.7)	23 (0.8)	330 (4.1)
Spain	79 (0.7)	506 (2.0)	6 (0.4)	491 (5.0)	5 (0.3)	500 (5.9)	3 (0.3)	463 (5.7)	6 (0.3)	437 (4.8)
Sweden	50 (1.0)	532 (2.8)	18 (0.7)	547 (3.6)	19 (0.5)	535 (3.7)	7 (0.4)	512 (6.2)	6 (0.6)	475 (7.0)
Türkiye (5)	52 (1.1)	575 (4.1)	13 (0.7)	561 (5.7)	14 (0.6)	544 (5.9)	9 (0.4)	536 (6.1)	12 (0.8)	477 (6.0)
United Arab Emirates	52 (0.4)	524 (1.4)	12 (0.3)	506 (3.0)	11 (0.2)	487 (3.0)	8 (0.2)	457 (3.1)	17 (0.3)	452 (2.2)
United States	57 (0.7)	530 (3.2)	14 (0.5)	532 (4.2)	11 (0.4)	527 (4.5)	7 (0.3)	497 (5.8)	10 (0.5)	436 (3.7)
Uzbekistan	53 (1.1)	460 (3.2)	10 (0.5)	448 (6.4)	9 (0.4)	439 (5.5)	5 (0.4)	423 (7.1)	24 (0.9)	414 (3.7)
International Average	55 (0.1)	516 (0.4)	13 (0.1)	511 (0.7)	12 (0.1)	502 (0.8)	7 (0.1)	475 (1.0)	13 (0.1)	451 (0.7)
Benchmarking Participants										
Ontario, Canada	52 (1.0)	510 (3.9)	13 (0.6)	515 (5.3)	15 (0.7)	517 (5.0)	9 (0.5)	495 (5.8)	10 (0.7)	450 (5.9)
Quebec, Canada	68 (0.9)	518 (2.8)	12 (0.6)	523 (4.6)	11 (0.6)	521 (5.5)	4 (0.4)	515 (8.3)	5 (0.6)	461 (7.0)
Abu Dhabi, UAE	47 (0.7)	491 (2.2)	11 (0.4)	459 (4.8)	12 (0.5)	435 (5.0)	9 (0.3)	414 (4.3)	20 (0.5)	423 (3.3)
Dubai, UAE	56 (0.7)	572 (1.8)	13 (0.5)	563 (3.6)	11 (0.4)	556 (3.5)	7 (0.3)	529 (4.4)	13 (0.4)	505 (4.1)
Sharjah, UAE	54 (1.2)	525 (3.7)	12 (1.0)	513 (6.7)	10 (0.5)	494 (5.9)	7 (0.3)	462 (5.3)	17 (0.5)	463 (4.9)

() Standard errors appear in parentheses. Because of rounding some results may appear inconsistent.
A tilde (~) indicates insufficient data to report result.

SOURCE: IEA's Trends in International Mathematics and Science Study - TIMSS 2023
Downloaded from <https://timss2023.org/results>

Exhibit 6.1.14: Frequency of Student Absences

Country	Never or Almost Never		Once Every Two Months		Once a Month		Once Every Two Weeks		Once a Week	
	Percent of Students	Average Achievement	Percent of Students	Average Achievement	Percent of Students	Average Achievement	Percent of Students	Average Achievement	Percent of Students	Average Achievement
Albania	60 (1.8)	505 (4.8)	12 (1.0)	500 (8.8)	10 (0.9)	491 (8.0)	4 (0.5)	459 (10.0)	15 (1.1)	455 (7.1)
Armenia	41 (1.0)	468 (2.8)	11 (0.8)	465 (4.5)	15 (0.6)	460 (5.1)	9 (0.5)	448 (3.9)	24 (0.9)	439 (3.8)
Australia	54 (1.2)	560 (2.9)	16 (0.7)	563 (3.9)	15 (0.7)	553 (4.2)	7 (0.5)	533 (6.5)	7 (0.5)	487 (5.6)
Azerbaijan	40 (1.0)	435 (3.6)	14 (0.7)	440 (4.7)	14 (0.6)	420 (5.9)	9 (0.5)	402 (6.1)	24 (0.7)	403 (3.9)
Bahrain	55 (1.2)	500 (4.2)	10 (0.6)	473 (6.3)	10 (0.5)	454 (6.4)	8 (0.4)	443 (8.6)	18 (0.7)	430 (5.2)
Belgium (Flemish)	73 (0.9)	498 (2.4)	10 (0.4)	492 (5.4)	7 (0.6)	478 (7.0)	3 (0.3)	455 (9.1)	7 (0.5)	438 (5.6)
Belgium (French)	73 (0.9)	490 (2.6)	8 (0.5)	485 (5.7)	5 (0.4)	471 (7.3)	6 (0.3)	463 (7.0)	9 (0.6)	425 (5.1)
Bosnia & Herzegovina	52 (1.1)	462 (4.0)	14 (1.1)	463 (4.3)	10 (0.6)	445 (6.1)	7 (0.9)	434 (9.8)	17 (1.1)	409 (6.4)
Brazil	53 (0.8)	449 (3.6)	7 (0.5)	427 (7.3)	10 (0.4)	400 (8.4)	9 (0.5)	401 (7.1)	21 (0.7)	396 (3.7)
Bulgaria	50 (1.4)	546 (5.4)	16 (0.8)	550 (5.7)	15 (0.8)	536 (7.9)	7 (0.5)	493 (7.9)	12 (0.8)	450 (10.3)
Canada	57 (0.6)	527 (2.0)	13 (0.4)	531 (3.0)	14 (0.4)	530 (3.6)	7 (0.3)	517 (4.1)	9 (0.4)	474 (4.0)
Chile	58 (0.7)	491 (2.4)	7 (0.4)	487 (6.8)	8 (0.5)	480 (6.9)	8 (0.5)	464 (5.9)	18 (0.6)	452 (4.2)
Chinese Taipei	73 (0.8)	579 (1.8)	15 (0.6)	574 (3.2)	5 (0.3)	561 (5.1)	2 ~	~	5 (0.3)	511 (6.2)
Cyprus	68 (1.0)	499 (3.0)	13 (0.6)	485 (5.2)	9 (0.5)	477 (5.6)	4 (0.4)	452 (9.8)	6 (0.4)	410 (7.2)
Czech Republic	32 (0.9)	532 (3.0)	24 (0.8)	534 (3.3)	20 (0.6)	534 (3.0)	12 (0.6)	523 (5.3)	11 (0.6)	484 (4.3)
Denmark	46 (1.0)	531 (2.8)	16 (0.6)	532 (4.4)	18 (0.6)	522 (3.8)	9 (0.5)	513 (4.8)	11 (0.6)	485 (5.0)
England	65 (1.2)	565 (3.0)	15 (0.9)	566 (4.2)	10 (0.5)	554 (5.9)	4 (0.4)	527 (8.5)	5 (0.5)	464 (8.1)
Finland	28 (0.7)	547 (3.4)	32 (0.7)	550 (3.1)	25 (0.6)	552 (3.6)	9 (0.4)	534 (4.9)	6 (0.4)	463 (8.1)
France	75 (0.8)	497 (2.6)	9 (0.4)	484 (5.7)	7 (0.5)	480 (6.9)	3 (0.2)	451 (8.0)	6 (0.5)	428 (7.0)
Georgia	40 (1.1)	477 (3.4)	12 (0.7)	474 (6.6)	13 (0.8)	479 (4.6)	10 (0.7)	453 (6.3)	25 (0.9)	442 (4.6)
Germany	63 (0.9)	526 (3.0)	11 (0.6)	521 (4.7)	12 (0.5)	520 (6.4)	5 (0.4)	492 (9.4)	9 (0.5)	466 (5.3)
Hong Kong SAR	75 (1.0)	557 (3.8)	12 (0.7)	543 (5.7)	5 (0.3)	536 (12.8)	3 (0.3)	462 (12.7)	5 (0.4)	447 (9.3)
Hungary	33 (1.0)	542 (3.4)	25 (0.8)	535 (4.3)	21 (0.8)	526 (4.9)	10 (0.6)	515 (5.9)	11 (0.7)	461 (6.6)
Iran, Islamic Rep. of	47 (1.3)	451 (4.3)	12 (0.6)	448 (6.5)	10 (0.7)	439 (7.8)	7 (0.5)	430 (8.0)	23 (1.1)	394 (6.4)
Ireland	49 (1.1)	538 (3.6)	21 (0.8)	541 (4.6)	18 (0.9)	537 (5.0)	7 (0.5)	512 (8.6)	5 (0.5)	447 (8.2)
Italy	64 (1.1)	519 (2.6)	9 (0.5)	512 (4.7)	11 (0.5)	511 (5.8)	7 (0.5)	503 (5.4)	9 (0.5)	464 (3.9)
Japan	68 (0.9)	564 (2.4)	18 (0.8)	552 (3.5)	8 (0.5)	541 (5.9)	2 ~	~	4 (0.3)	488 (7.9)
Jordan	34 (1.2)	444 (4.9)	15 (0.9)	433 (6.2)	17 (1.0)	409 (8.6)	10 (0.7)	397 (7.6)	24 (1.0)	389 (6.0)
Kazakhstan	42 (1.1)	492 (3.6)	14 (0.5)	476 (4.0)	12 (0.5)	464 (6.3)	7 (0.4)	462 (8.1)	24 (1.0)	423 (3.4)
Korea, Rep. of	78 (0.7)	589 (2.3)	12 (0.5)	574 (4.4)	6 (0.4)	578 (5.4)	1 ~	~	2 ~	~
Kosovo	51 (1.0)	414 (3.9)	13 (0.6)	417 (6.5)	9 (0.5)	402 (8.3)	6 (0.5)	386 (7.1)	21 (0.9)	374 (4.6)
Kuwait	40 (1.1)	425 (6.5)	7 (0.5)	386 (8.0)	9 (0.7)	370 (7.8)	11 (0.6)	346 (8.7)	33 (0.9)	335 (7.1)
Latvia	48 (1.1)	532 (3.1)	16 (0.8)	542 (5.0)	13 (0.7)	541 (5.0)	8 (0.6)	511 (7.2)	15 (0.9)	489 (4.4)
Lithuania	63 (0.9)	543 (3.0)	12 (0.6)	544 (4.1)	11 (0.5)	546 (4.7)	5 (0.4)	524 (6.3)	9 (0.6)	490 (5.9)
Macao SAR	77 (0.5)	544 (1.6)	14 (0.4)	527 (2.7)	5 (0.3)	510 (6.2)	2 ~	~	3 (0.2)	446 (6.5)
Montenegro	53 (0.9)	473 (2.1)	13 (0.5)	472 (3.6)	10 (0.5)	464 (4.8)	7 (0.4)	453 (6.3)	17 (0.7)	421 (3.1)
Morocco	61 (1.3)	405 (5.7)	12 (0.8)	397 (9.8)	9 (0.6)	380 (9.1)	5 (0.4)	353 (12.1)	13 (0.7)	360 (7.0)
Netherlands	64 (1.1)	523 (2.5)	16 (0.7)	529 (4.7)	11 (0.7)	507 (6.1)	4 (0.4)	488 (8.3)	5 (0.4)	461 (8.9)
New Zealand	52 (0.9)	526 (3.2)	15 (0.6)	544 (5.1)	13 (0.6)	530 (5.0)	8 (0.4)	502 (5.1)	13 (0.6)	457 (5.6)
North Macedonia	43 (1.2)	462 (4.3)	13 (0.7)	449 (5.7)	12 (0.6)	436 (6.3)	7 (0.5)	415 (6.3)	24 (1.0)	408 (5.2)
Norway (5)	55 (0.9)	534 (2.8)	16 (0.5)	544 (4.3)	16 (0.6)	537 (4.2)	6 (0.4)	528 (5.4)	7 (0.5)	483 (7.8)
Oman	39 (0.8)	458 (4.4)	14 (0.5)	438 (5.9)	14 (0.6)	412 (5.4)	9 (0.4)	412 (8.0)	24 (0.8)	413 (5.0)
Poland	49 (1.1)	559 (2.4)	17 (0.6)	555 (2.7)	16 (0.7)	555 (4.2)	9 (0.5)	537 (5.1)	10 (0.5)	502 (4.6)
Portugal	80 (0.8)	516 (2.2)	6 (0.4)	517 (6.1)	5 (0.4)	499 (6.2)	3 (0.3)	511 (9.6)	6 (0.5)	452 (4.6)
Qatar	53 (1.2)	502 (3.7)	10 (0.5)	474 (5.9)	10 (0.5)	460 (7.0)	7 (0.4)	435 (8.4)	20 (0.8)	420 (4.8)
Romania	64 (1.3)	539 (4.3)	11 (0.7)	541 (6.7)	10 (0.7)	527 (6.4)	6 (0.6)	497 (9.8)	10 (1.1)	465 (8.8)
Saudi Arabia	35 (1.1)	466 (4.4)	8 (0.4)	415 (6.9)	10 (0.5)	419 (7.4)	13 (0.6)	397 (5.9)	33 (0.9)	410 (4.6)
Serbia	51 (1.0)	518 (3.4)	18 (0.9)	523 (5.2)	12 (0.7)	513 (5.1)	6 (0.5)	490 (6.8)	12 (0.7)	467 (5.6)
Singapore	75 (0.6)	618 (2.3)	11 (0.4)	609 (5.1)	7 (0.3)	594 (4.9)	3 (0.2)	547 (9.5)	5 (0.3)	486 (6.3)
Slovak Republic	30 (1.0)	538 (3.5)	21 (0.8)	537 (3.4)	22 (0.8)	536 (4.4)	14 (0.8)	504 (6.7)	14 (0.7)	457 (7.8)
Slovenia	58 (0.9)	535 (2.6)	14 (0.7)	536 (4.2)	12 (0.5)	529 (4.3)	6 (0.4)	504 (7.4)	10 (0.5)	471 (4.2)
South Africa (5)	52 (1.2)	335 (6.6)	9 (0.5)	306 (12.7)	9 (0.4)	287 (9.2)	7 (0.5)	242 (9.2)	23 (0.8)	271 (5.3)
Spain	79 (0.7)	511 (1.9)	6 (0.4)	497 (5.2)	5 (0.3)	500 (4.8)	3 (0.3)	469 (5.2)	6 (0.3)	451 (4.1)
Sweden	50 (1.0)	535 (3.0)	18 (0.7)	549 (4.2)	19 (0.5)	542 (4.6)	7 (0.4)	516 (6.4)	6 (0.6)	470 (9.7)
Türkiye (5)	52 (1.1)	587 (3.4)	13 (0.7)	580 (4.2)	14 (0.6)	560 (5.5)	9 (0.4)	557 (5.3)	12 (0.8)	509 (5.4)
United Arab Emirates	52 (0.4)	526 (1.8)	12 (0.3)	501 (3.7)	11 (0.2)	477 (3.8)	8 (0.2)	446 (5.0)	17 (0.3)	444 (2.6)
United States	57 (0.7)	547 (2.9)	14 (0.5)	543 (4.3)	11 (0.4)	542 (4.0)	7 (0.3)	511 (5.4)	10 (0.5)	455 (4.1)
Uzbekistan	53 (1.1)	430 (3.7)	10 (0.5)	409 (6.4)	9 (0.4)	404 (6.3)	5 (0.4)	384 (7.0)	24 (0.9)	382 (3.3)
International Average	55 (0.1)	508 (0.5)	13 (0.1)	502 (0.7)	12 (0.1)	492 (0.8)	7 (0.1)	467 (1.0)	13 (0.1)	442 (0.8)
Benchmarking Participants										
Ontario, Canada	52 (1.0)	533 (3.4)	13 (0.6)	537 (5.0)	15 (0.7)	533 (5.1)	9 (0.5)	519 (6.3)	10 (0.7)	478 (6.0)
Quebec, Canada	68 (0.9)	512 (2.6)	12 (0.6)	515 (4.7)	11 (0.6)	509 (5.0)	4 (0.4)	504 (7.8)	5 (0.6)	457 (8.4)
Abu Dhabi, UAE	47 (0.7)	487 (2.9)	11 (0.4)	444 (5.9)	12 (0.5)	414 (6.4)	9 (0.3)	392 (6.1)	20 (0.5)	405 (3.8)
Dubai, UAE	56 (0.7)	581 (2.0)	13 (0.5)	568 (3.2)	11 (0.4)	559 (3.4)	7 (0.3)	530 (5.9)	13 (0.4)	507 (4.2)
Sharjah, UAE	54 (1.2)	528 (4.1)	12 (1.0)	510 (7.8)	10 (0.5)	487 (7.3)	7 (0.3)	454 (7.9)	17 (0.5)	458 (5.4)

() Standard errors appear in parentheses. Because of rounding some results may appear inconsistent.
A tilde (~) indicates insufficient data to report result.

SOURCE: IEA's Trends in International Mathematics and Science Study - TIMSS 2023
Downloaded from <https://timss2023.org/results>

Exhibit 6.1.15: Frequency of Student Absences

Country	Never or Almost Never		Once Every Two Months		Once a Month		Once Every Two Weeks		Once a Week	
	Percent of Students	Average Achievement	Percent of Students	Average Achievement	Percent of Students	Average Achievement	Percent of Students	Average Achievement	Percent of Students	Average Achievement
Australia	35 (0.9)	526 (3.9)	20 (0.7)	531 (4.0)	22 (0.7)	509 (3.9)	15 (0.6)	486 (5.7)	8 (0.6)	446 (7.4)
Austria	48 (0.9)	512 (3.0)	20 (0.7)	527 (3.4)	18 (0.7)	512 (3.6)	10 (0.5)	504 (4.7)	4 (0.3)	471 (6.5)
Azerbaijan	32 (0.9)	496 (4.4)	17 (0.6)	505 (4.8)	17 (0.6)	484 (5.8)	10 (0.5)	473 (5.8)	24 (1.1)	439 (5.0)
Bahrain	43 (0.7)	449 (2.7)	12 (0.5)	447 (4.8)	15 (0.5)	439 (4.9)	14 (0.4)	407 (4.7)	16 (0.6)	370 (4.8)
Brazil	50 (0.6)	383 (3.3)	7 (0.4)	402 (6.5)	11 (0.4)	398 (4.8)	12 (0.4)	386 (3.9)	19 (0.6)	343 (3.7)
Chile	49 (0.9)	417 (3.7)	10 (0.5)	442 (5.3)	14 (0.6)	435 (4.3)	13 (0.5)	425 (5.5)	14 (0.7)	373 (5.3)
Chinese Taipei	78 (0.8)	612 (3.1)	12 (0.5)	589 (5.3)	6 (0.4)	576 (7.4)	2 ~	~	2 ~	~
Cote d'Ivoire	69 (1.5)	273 (6.4)	5 (0.4)	258 (5.1)	6 (0.4)	244 (7.9)	5 (0.4)	233 (8.7)	16 (0.9)	243 (4.8)
Cyprus	45 (0.9)	508 (3.4)	20 (0.7)	503 (4.4)	20 (0.6)	491 (4.2)	9 (0.5)	478 (5.1)	5 (0.4)	409 (7.0)
Czech Republic	21 (0.6)	520 (3.0)	23 (0.7)	530 (2.9)	31 (0.6)	523 (2.5)	18 (0.5)	518 (2.9)	7 (0.4)	459 (6.2)
England	48 (0.9)	539 (5.1)	21 (0.7)	540 (5.7)	17 (0.8)	517 (6.0)	10 (0.6)	491 (6.2)	5 (0.4)	459 (12.4)
Finland	19 (0.6)	514 (3.9)	27 (0.7)	521 (2.9)	29 (0.7)	507 (2.9)	17 (0.6)	493 (3.6)	9 (0.4)	459 (4.7)
France	51 (1.0)	495 (3.3)	16 (0.6)	491 (4.5)	17 (0.7)	469 (4.1)	8 (0.5)	448 (5.9)	7 (0.4)	407 (6.3)
Georgia	26 (1.0)	485 (5.0)	13 (0.6)	480 (5.7)	19 (0.7)	483 (5.2)	18 (0.8)	469 (4.7)	24 (0.9)	427 (5.4)
Hong Kong SAR	79 (1.0)	584 (5.0)	12 (0.7)	570 (7.3)	5 (0.3)	542 (9.5)	2 ~	~	3 (0.3)	499 (13.4)
Hungary	24 (0.8)	524 (3.7)	33 (0.9)	520 (3.8)	28 (0.7)	503 (4.1)	10 (0.5)	481 (6.3)	5 (0.6)	396 (14.0)
Iran, Islamic Rep. of	55 (0.9)	438 (3.5)	16 (0.5)	430 (4.8)	13 (0.5)	423 (4.7)	7 (0.4)	395 (6.5)	9 (0.5)	356 (6.1)
Ireland	30 (0.9)	539 (2.8)	23 (0.8)	532 (4.5)	26 (0.7)	524 (3.6)	15 (0.6)	502 (4.6)	6 (0.5)	455 (5.7)
Israel	34 (0.8)	506 (4.8)	14 (0.5)	507 (5.6)	20 (0.6)	502 (5.0)	16 (0.5)	482 (4.6)	16 (0.7)	427 (4.8)
Italy	39 (0.9)	506 (3.3)	16 (0.6)	514 (4.4)	23 (0.6)	508 (3.9)	17 (0.6)	491 (4.3)	6 (0.7)	441 (6.9)
Japan	74 (0.8)	602 (3.2)	15 (0.7)	588 (4.9)	6 (0.4)	568 (6.7)	2 ~	~	2 ~	~
Jordan	26 (0.9)	412 (4.3)	16 (0.6)	402 (4.6)	21 (0.6)	402 (5.2)	16 (0.6)	377 (4.3)	21 (0.7)	347 (3.8)
Kazakhstan	37 (0.9)	466 (4.9)	21 (0.7)	469 (3.8)	19 (0.6)	456 (4.8)	10 (0.5)	438 (5.2)	13 (0.6)	410 (5.0)
Korea, Rep. of	83 (0.8)	605 (3.1)	8 (0.4)	576 (7.5)	6 (0.5)	552 (6.2)	1 ~	~	1 ~	~
Kuwait	31 (1.5)	443 (7.7)	11 (0.6)	429 (8.2)	15 (0.7)	401 (5.1)	18 (0.7)	381 (5.3)	26 (1.2)	349 (6.1)
Lithuania	47 (0.8)	521 (3.3)	15 (0.6)	526 (4.5)	20 (0.6)	519 (4.4)	11 (0.5)	504 (4.6)	8 (0.5)	447 (6.4)
Malaysia	36 (0.9)	435 (4.3)	16 (0.5)	431 (3.7)	14 (0.4)	419 (4.0)	11 (0.4)	396 (3.8)	22 (0.9)	358 (3.2)
Malta	49 (0.9)	519 (1.9)	16 (0.6)	512 (3.6)	19 (0.6)	492 (3.4)	9 (0.5)	472 (4.9)	7 (0.4)	404 (5.2)
Morocco	65 (0.8)	380 (3.1)	12 (0.5)	390 (4.1)	7 (0.4)	381 (5.2)	4 (0.3)	376 (7.0)	11 (0.6)	353 (4.1)
Norway (9)	39 (0.9)	507 (2.7)	20 (0.6)	514 (3.3)	23 (0.7)	505 (3.3)	12 (0.6)	490 (3.5)	6 (0.4)	462 (5.8)
Oman	49 (0.8)	431 (2.7)	16 (0.5)	427 (4.4)	13 (0.4)	402 (4.8)	7 (0.4)	386 (5.8)	15 (0.5)	362 (4.6)
Palestinian Nat'l Auth.	46 (0.8)	405 (3.3)	20 (0.5)	389 (3.4)	14 (0.5)	373 (4.7)	7 (0.4)	347 (5.4)	13 (0.6)	327 (5.3)
Portugal	75 (0.8)	479 (2.6)	11 (0.5)	485 (5.4)	9 (0.4)	476 (5.2)	4 (0.3)	437 (5.9)	3 (0.3)	411 (6.5)
Qatar	41 (1.4)	486 (4.8)	16 (0.8)	476 (6.8)	17 (0.8)	449 (6.2)	11 (0.6)	418 (6.0)	16 (0.9)	375 (5.1)
Romania	50 (1.4)	510 (4.7)	13 (0.8)	517 (7.0)	14 (0.8)	504 (7.2)	9 (0.6)	480 (8.1)	13 (0.9)	442 (7.9)
Saudi Arabia	28 (1.0)	422 (4.2)	6 (0.4)	425 (6.1)	11 (0.5)	427 (4.5)	18 (0.6)	394 (4.5)	36 (1.1)	368 (3.3)
Singapore	69 (1.2)	620 (5.4)	16 (0.7)	604 (7.3)	8 (0.5)	566 (7.3)	4 (0.4)	531 (10.9)	3 (0.3)	461 (10.7)
South Africa (9)	60 (0.9)	404 (3.4)	10 (0.4)	400 (4.6)	11 (0.4)	393 (5.2)	5 (0.3)	383 (6.9)	14 (0.6)	366 (3.7)
Sweden	38 (0.9)	530 (2.9)	16 (0.6)	536 (4.4)	20 (0.6)	521 (3.5)	14 (0.7)	506 (4.4)	11 (0.6)	475 (4.8)
Türkiye	40 (1.1)	539 (5.2)	14 (0.6)	512 (6.3)	20 (0.6)	502 (6.1)	14 (0.6)	484 (6.6)	12 (0.6)	442 (6.8)
United Arab Emirates	48 (0.5)	509 (1.8)	15 (0.3)	513 (2.7)	14 (0.3)	487 (2.6)	10 (0.3)	462 (2.9)	12 (0.3)	417 (2.9)
United States	42 (0.8)	498 (4.8)	19 (0.6)	506 (4.8)	19 (0.5)	496 (4.6)	13 (0.6)	471 (3.9)	7 (0.5)	414 (5.8)
Uzbekistan	40 (1.2)	434 (5.4)	14 (0.7)	431 (5.5)	17 (0.6)	432 (5.5)	11 (0.7)	410 (5.3)	18 (1.0)	383 (4.0)
International Average	46 (0.1)	488 (0.6)	16 (0.1)	486 (0.8)	16 (0.1)	472 (0.8)	10 (0.1)	444 (0.9)	12 (0.1)	406 (1.0)
Benchmarking Participants										
Abu Dhabi, UAE	45 (0.9)	481 (2.8)	14 (0.4)	474 (3.7)	15 (0.5)	453 (3.3)	11 (0.6)	428 (4.1)	15 (0.6)	394 (4.5)
Dubai, UAE	48 (1.0)	564 (2.9)	18 (0.7)	568 (3.6)	15 (0.5)	539 (3.6)	10 (0.4)	515 (5.3)	9 (0.5)	456 (6.9)
Sharjah, UAE	55 (1.4)	510 (4.8)	14 (0.6)	509 (7.1)	12 (0.6)	489 (8.0)	8 (0.6)	467 (6.2)	11 (0.7)	434 (6.0)

() Standard errors appear in parentheses. Because of rounding some results may appear inconsistent.
 A tilde (~) indicates insufficient data to report result.

SOURCE: IEA's Trends in International Mathematics and Science Study - TIMSS 2023
 Downloaded from <https://timss2023.org/results>

Exhibit 6.1.16: Frequency of Student Absences

Country	Never or Almost Never		Once Every Two Months		Once a Month		Once Every Two Weeks		Once a Week	
	Percent of Students	Average Achievement	Percent of Students	Average Achievement	Percent of Students	Average Achievement	Percent of Students	Average Achievement	Percent of Students	Average Achievement
Australia	35 (0.9)	538 (3.4)	20 (0.7)	544 (4.1)	22 (0.7)	522 (3.9)	15 (0.6)	500 (5.7)	8 (0.6)	454 (7.2)
Austria	48 (0.9)	514 (2.7)	20 (0.7)	525 (4.4)	18 (0.7)	511 (4.2)	10 (0.5)	499 (5.9)	4 (0.3)	469 (7.1)
Azerbaijan	32 (0.9)	426 (3.5)	17 (0.6)	432 (4.8)	17 (0.6)	416 (3.9)	10 (0.5)	413 (5.6)	24 (1.1)	376 (3.2)
Bahrain	43 (0.7)	480 (2.9)	12 (0.5)	474 (5.7)	15 (0.5)	460 (5.2)	14 (0.4)	431 (5.2)	16 (0.6)	386 (4.4)
Brazil	50 (0.6)	429 (2.9)	7 (0.4)	443 (6.8)	11 (0.4)	436 (4.4)	12 (0.4)	427 (4.0)	19 (0.6)	382 (3.0)
Chile	49 (0.9)	456 (3.1)	10 (0.5)	479 (5.0)	14 (0.6)	477 (4.4)	13 (0.5)	462 (4.5)	14 (0.7)	416 (4.7)
Chinese Taipei	78 (0.8)	581 (2.5)	12 (0.5)	558 (4.5)	6 (0.4)	542 (6.4)	2 ~	~ ~	2 ~	~ ~
Cote d'Ivoire	69 (1.5)	202 (10.8)	5 (0.4)	157 (10.0)	6 (0.4)	142 (7.8)	5 (0.4)	120 (9.7)	16 (0.9)	152 (5.1)
Cyprus	45 (0.9)	482 (3.6)	20 (0.7)	471 (4.7)	20 (0.6)	459 (4.0)	9 (0.5)	443 (5.4)	5 (0.4)	379 (7.0)
Czech Republic	21 (0.6)	528 (2.7)	23 (0.7)	543 (2.5)	31 (0.6)	531 (2.3)	18 (0.5)	525 (2.7)	7 (0.4)	470 (6.1)
England	48 (0.9)	547 (4.8)	21 (0.7)	543 (5.6)	17 (0.8)	522 (5.4)	10 (0.6)	496 (7.3)	5 (0.4)	463 (12.8)
Finland	19 (0.6)	543 (4.5)	27 (0.7)	552 (3.6)	29 (0.7)	535 (3.5)	17 (0.6)	516 (4.6)	9 (0.4)	476 (6.1)
France	51 (1.0)	501 (3.5)	16 (0.6)	501 (4.6)	17 (0.7)	480 (3.6)	8 (0.5)	453 (6.0)	7 (0.4)	416 (6.4)
Georgia	26 (1.0)	466 (3.9)	13 (0.6)	458 (4.5)	19 (0.7)	463 (4.2)	18 (0.8)	448 (4.7)	24 (0.9)	413 (5.0)
Hong Kong SAR	79 (1.0)	536 (4.7)	12 (0.7)	523 (6.9)	5 (0.3)	492 (8.3)	2 ~	~ ~	3 (0.3)	455 (11.0)
Hungary	24 (0.8)	539 (3.3)	33 (0.9)	535 (3.4)	28 (0.7)	519 (3.4)	10 (0.5)	495 (6.0)	5 (0.6)	421 (12.9)
Iran, Islamic Rep. of	55 (0.9)	433 (3.5)	16 (0.5)	429 (4.9)	13 (0.5)	419 (5.3)	7 (0.4)	387 (6.7)	9 (0.5)	352 (6.3)
Ireland	30 (0.9)	546 (3.5)	23 (0.8)	535 (5.9)	26 (0.7)	528 (3.6)	15 (0.6)	503 (5.8)	6 (0.5)	456 (5.9)
Israel	34 (0.8)	497 (4.4)	14 (0.5)	502 (5.5)	20 (0.6)	494 (4.9)	16 (0.5)	476 (4.9)	16 (0.7)	423 (4.6)
Italy	39 (0.9)	510 (3.4)	16 (0.6)	512 (4.3)	23 (0.6)	506 (4.1)	17 (0.6)	488 (4.1)	6 (0.7)	438 (7.7)
Japan	74 (0.8)	562 (2.8)	15 (0.7)	553 (5.7)	6 (0.4)	541 (6.9)	2 ~	~ ~	2 ~	~ ~
Jordan	26 (0.9)	441 (4.8)	16 (0.6)	425 (4.9)	21 (0.6)	426 (6.6)	16 (0.6)	405 (5.5)	21 (0.7)	365 (4.4)
Kazakhstan	37 (0.9)	456 (3.7)	21 (0.7)	453 (3.6)	19 (0.6)	446 (4.0)	10 (0.5)	433 (4.8)	13 (0.6)	395 (4.3)
Korea, Rep. of	83 (0.8)	553 (2.3)	8 (0.4)	527 (6.3)	6 (0.5)	506 (5.4)	1 ~	~ ~	1 ~	~ ~
Kuwait	31 (1.5)	467 (8.4)	11 (0.6)	454 (6.8)	15 (0.7)	427 (5.2)	18 (0.7)	405 (6.3)	26 (1.2)	363 (6.6)
Lithuania	47 (0.8)	526 (3.5)	15 (0.6)	532 (4.0)	20 (0.6)	522 (4.1)	11 (0.5)	512 (4.7)	8 (0.5)	461 (6.1)
Malaysia	36 (0.9)	447 (4.2)	16 (0.5)	451 (3.9)	14 (0.4)	436 (4.3)	11 (0.4)	413 (4.8)	22 (0.9)	376 (4.0)
Malta	49 (0.9)	522 (2.2)	16 (0.6)	519 (4.3)	19 (0.6)	492 (3.7)	9 (0.5)	471 (5.8)	7 (0.4)	396 (6.3)
Morocco	65 (0.8)	329 (3.6)	12 (0.5)	342 (5.0)	7 (0.4)	328 (6.6)	4 (0.3)	327 (8.7)	11 (0.6)	301 (4.9)
Norway (9)	39 (0.9)	495 (3.1)	20 (0.6)	501 (3.7)	23 (0.7)	496 (3.9)	12 (0.6)	476 (3.9)	6 (0.4)	445 (5.5)
Oman	49 (0.8)	480 (2.8)	16 (0.5)	474 (4.2)	13 (0.4)	450 (4.6)	7 (0.4)	421 (5.6)	15 (0.5)	397 (3.9)
Palestinian Nat'l Auth.	46 (0.8)	418 (3.1)	20 (0.5)	400 (3.9)	14 (0.5)	384 (4.9)	7 (0.4)	349 (6.1)	13 (0.6)	336 (4.2)
Portugal	75 (0.8)	508 (2.3)	11 (0.5)	515 (4.2)	9 (0.4)	512 (5.1)	4 (0.3)	471 (7.1)	3 (0.3)	445 (7.3)
Qatar	41 (1.4)	520 (4.8)	16 (0.8)	504 (6.4)	17 (0.8)	479 (5.8)	11 (0.6)	446 (5.1)	16 (0.9)	398 (4.6)
Romania	50 (1.4)	482 (3.9)	13 (0.8)	481 (6.1)	14 (0.8)	473 (5.8)	9 (0.6)	455 (7.1)	13 (0.9)	416 (6.2)
Saudi Arabia	28 (1.0)	447 (3.9)	6 (0.4)	448 (7.3)	11 (0.5)	446 (4.9)	18 (0.6)	424 (4.9)	36 (1.1)	387 (4.0)
Singapore	69 (1.2)	621 (5.1)	16 (0.7)	604 (7.1)	8 (0.5)	563 (7.6)	4 (0.4)	538 (11.0)	3 (0.3)	469 (11.8)
South Africa (9)	60 (0.9)	373 (4.2)	10 (0.4)	370 (6.7)	11 (0.4)	365 (6.6)	5 (0.3)	350 (9.4)	14 (0.6)	312 (4.0)
Sweden	38 (0.9)	535 (3.7)	16 (0.6)	546 (4.5)	20 (0.6)	524 (4.2)	14 (0.7)	511 (5.1)	11 (0.6)	473 (6.8)
Türkiye	40 (1.1)	556 (4.0)	14 (0.6)	528 (4.9)	20 (0.6)	526 (4.9)	14 (0.6)	509 (5.8)	12 (0.6)	470 (6.2)
United Arab Emirates	48 (0.5)	513 (2.0)	15 (0.3)	513 (3.0)	14 (0.3)	485 (2.7)	10 (0.3)	456 (3.4)	12 (0.3)	400 (3.2)
United States	42 (0.8)	524 (4.5)	19 (0.6)	528 (4.5)	19 (0.5)	522 (4.2)	13 (0.6)	500 (4.0)	7 (0.5)	437 (6.1)
Uzbekistan	40 (1.2)	405 (4.4)	14 (0.7)	409 (4.9)	17 (0.6)	405 (4.3)	11 (0.7)	387 (5.0)	18 (1.0)	364 (4.8)
International Average	46 (0.1)	487 (0.6)	16 (0.1)	484 (0.8)	16 (0.1)	470 (0.8)	10 (0.1)	445 (1.0)	12 (0.1)	405 (1.0)
Benchmarking Participants										
Abu Dhabi, UAE	45 (0.9)	480 (3.9)	14 (0.4)	469 (4.5)	15 (0.5)	445 (4.2)	11 (0.6)	411 (5.5)	15 (0.6)	363 (4.8)
Dubai, UAE	48 (1.0)	568 (3.3)	18 (0.7)	568 (4.5)	15 (0.5)	541 (4.1)	10 (0.4)	516 (5.2)	9 (0.5)	446 (7.0)
Sharjah, UAE	55 (1.4)	518 (4.9)	14 (0.6)	514 (8.3)	12 (0.6)	490 (7.4)	8 (0.6)	464 (6.9)	11 (0.7)	424 (5.8)

() Standard errors appear in parentheses. Because of rounding some results may appear inconsistent.
 A tilde (~) indicates insufficient data to report result.

SOURCE: IEA's Trends in International Mathematics and Science Study - TIMSS 2023
 Downloaded from <https://timss2023.org/results>

Students' Attitudes Toward Mathematics

Students Like Learning Mathematics

In both fourth and eighth grades, students who reported they enjoyed learning mathematics had substantially higher average achievement than students who reported they did not enjoy learning mathematics. The items in the TIMSS 2023 *Students Like Learning Mathematics* scale (Exhibit 6.2.1) asked students in both fourth and eighth grades to report the extent of their agreement with seven items about their attitudes toward studying mathematics. Based on their responses, students were assigned into one of three categories on the scale: “very much like,” “somewhat like,” or “do not like” learning mathematics.

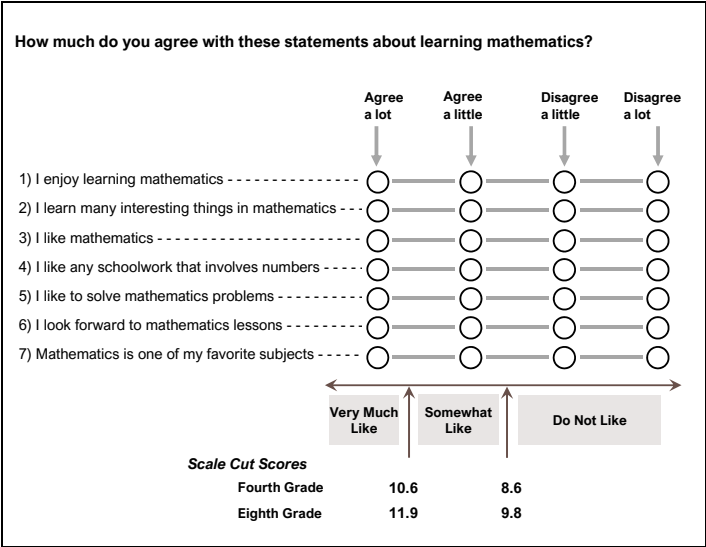
In general, fourth-grade students were positive about learning mathematics (Exhibit 6.2.2)—44 percent, on average, reported they “very much like” learning mathematics, and another 32 percent reported that they “somewhat” like it. However, 24 percent, on average, reported that they “do not like” learning mathematics. There is variation across countries in the percentage of students who reported they “do not like” learning mathematics; nine countries have less than 10 percent of students in this category, while 19 countries have more than 30 percent. Fourth-grade students who “very much like” learning mathematics have higher average mathematics achievement than their peers who reported less enjoyment of learning the subject. The difference in average mathematics achievement between fourth-grade students who “very much like” learning mathematics and those who “do not like” learning mathematics is 32 points internationally (519 vs. 487).

Internationally, almost half (46%) of eighth-grade students reported that they “do not like” learning mathematics (Exhibit 6.2.3). On average, only 21 percent of students reported that they “very much like” learning mathematics, and the remaining 32 percent reported that they “somewhat like” learning mathematics. There are no countries where more than 60 percent of students reported that they “very much like” learning mathematics and eight countries where more than 60 percent of students reported that they “do not like” learning mathematics. The difference in average mathematics achievement between students who “very much like” learning mathematics and those who “do not like” learning mathematics is noteworthy. There is a 50-point difference in average mathematics achievement between eighth-grade students who “very much like” learning mathematics and those who “do not like” learning mathematics (508 vs. 458).

Exhibit 6.2.1: Students Like Learning Mathematics

About the Scale

Students were scored according to their responses to seven statements on the *Students Like Learning Mathematics* scale. Cut scores divide the scale into three categories. Students who **Very Much Like Learning Mathematics** had a score at or above the cut score corresponding to “agreeing a lot” with four of the seven statements and “agreeing a little” with the other three, on average. Students who **Do Not Like Learning Mathematics** had a score at or below the cut score corresponding to “disagreeing a little” with four of the seven statements and “agreeing a little” with the other three, on average. All other students **Somewhat Like Learning Mathematics**.



SOURCE: IEA's Trends in International Mathematics and Science Study - TIMSS 2023
Downloaded from <https://timss2023.org/results>

Exhibit 6.2.2: Students Like Learning Mathematics

Country	Very Much Like Learning Mathematics		Somewhat Like Learning Mathematics		Do Not Like Learning Mathematics		Average Scale Score
	Percent of Students	Average Achievement	Percent of Students	Average Achievement	Percent of Students	Average Achievement	
Albania	77 (1.4)	519 (5.1)	17 (1.2)	507 (6.9)	6 (0.6)	483 (9.1)	11.4 (0.05)
Armenia	73 (1.1)	525 (2.6)	20 (0.9)	502 (4.6)	7 (0.5)	491 (6.8)	11.3 (0.04)
Australia	35 (1.0)	548 (3.8)	33 (0.9)	531 (3.5)	32 (1.2)	507 (3.2)	9.7 (0.05)
Azerbaijan	69 (1.0)	517 (3.3)	22 (0.9)	476 (4.6)	9 (0.5)	460 (6.0)	11.2 (0.04)
Bahrain	60 (1.3)	475 (4.5)	26 (0.9)	457 (4.9)	14 (0.9)	442 (7.0)	10.8 (0.06)
Belgium (Flemish)	31 (1.1)	537 (2.7)	37 (1.0)	526 (2.8)	31 (1.0)	507 (3.2)	9.6 (0.04)
Belgium (French)	42 (0.8)	502 (2.7)	36 (0.6)	487 (3.1)	22 (0.7)	475 (3.4)	10.1 (0.03)
Bosnia & Herzegovina	41 (1.2)	457 (4.8)	32 (1.4)	455 (3.9)	27 (1.3)	448 (4.8)	9.9 (0.05)
Brazil	51 (0.9)	419 (3.8)	30 (0.8)	409 (4.6)	19 (0.9)	399 (5.6)	10.3 (0.04)
Bulgaria	50 (1.6)	534 (4.4)	32 (1.1)	530 (4.4)	18 (1.0)	524 (6.8)	10.4 (0.06)
Canada	39 (0.7)	524 (2.4)	36 (0.6)	505 (2.4)	25 (0.6)	484 (2.7)	9.9 (0.03)
Chile	44 (1.1)	451 (3.3)	34 (0.8)	447 (3.4)	22 (0.9)	436 (3.7)	10.1 (0.04)
Chinese Taipei	22 (0.8)	621 (2.4)	32 (0.7)	616 (2.7)	46 (1.0)	596 (2.1)	8.9 (0.05)
Cyprus	47 (1.3)	532 (2.8)	32 (0.9)	512 (3.1)	20 (1.0)	493 (3.9)	10.2 (0.05)
Czech Republic	27 (0.8)	547 (3.0)	35 (0.8)	537 (2.9)	37 (1.2)	515 (2.4)	9.3 (0.04)
Denmark	23 (1.1)	540 (3.9)	38 (0.9)	527 (2.6)	39 (1.3)	513 (2.6)	9.1 (0.05)
England	36 (1.1)	578 (3.9)	31 (0.8)	557 (4.0)	34 (1.1)	528 (3.7)	9.6 (0.05)
Finland	26 (0.8)	545 (3.5)	37 (0.9)	535 (3.0)	37 (1.0)	518 (2.7)	9.3 (0.04)
France	46 (1.0)	501 (3.0)	36 (0.9)	477 (3.6)	19 (0.9)	465 (4.3)	10.2 (0.04)
Georgia	68 (1.2)	509 (3.0)	26 (1.0)	491 (4.0)	6 (0.4)	480 (7.9)	11.2 (0.04)
Germany	31 (0.9)	542 (3.3)	33 (0.8)	526 (2.8)	35 (1.0)	511 (2.7)	9.5 (0.04)
Hong Kong SAR	37 (1.3)	611 (4.3)	35 (1.0)	593 (4.7)	28 (1.0)	576 (4.6)	9.8 (0.06)
Hungary	37 (1.2)	535 (4.6)	33 (0.8)	522 (4.1)	30 (1.2)	510 (4.1)	9.7 (0.06)
Iran, Islamic Rep. of	70 (1.1)	431 (4.0)	21 (0.8)	404 (5.9)	9 (0.9)	398 (12.5)	11.1 (0.05)
Ireland	28 (1.2)	558 (4.3)	35 (1.0)	550 (3.4)	37 (1.4)	534 (4.0)	9.4 (0.06)
Italy	39 (1.2)	527 (3.4)	35 (0.9)	510 (3.7)	26 (1.3)	502 (4.0)	9.9 (0.06)
Japan	22 (0.8)	620 (3.2)	36 (0.8)	596 (2.6)	42 (1.1)	574 (2.7)	9.1 (0.04)
Jordan	62 (1.7)	443 (5.7)	24 (1.0)	412 (6.7)	14 (1.1)	403 (9.0)	10.9 (0.07)
Kazakhstan	53 (1.0)	498 (3.5)	37 (0.9)	486 (4.4)	10 (0.6)	472 (5.8)	10.6 (0.03)
Korea, Rep. of	22 (0.9)	624 (3.8)	30 (0.8)	604 (3.5)	48 (1.1)	576 (2.7)	8.9 (0.04)
Kosovo	74 (1.0)	462 (3.5)	20 (0.8)	437 (4.2)	5 (0.5)	417 (8.3)	11.3 (0.03)
Kuwait	56 (1.4)	397 (4.3)	28 (1.0)	385 (6.3)	16 (0.9)	374 (7.7)	10.6 (0.05)
Latvia	23 (0.8)	546 (3.9)	39 (0.9)	537 (3.5)	38 (1.2)	528 (3.4)	9.2 (0.05)
Lithuania	30 (1.0)	579 (3.8)	41 (1.0)	560 (3.5)	29 (1.1)	549 (4.0)	9.6 (0.04)
Macao SAR	36 (0.5)	608 (1.9)	35 (0.6)	577 (1.8)	30 (0.6)	556 (2.0)	9.7 (0.02)
Montenegro	53 (0.9)	490 (2.5)	30 (0.8)	470 (3.5)	17 (0.7)	471 (3.4)	10.5 (0.04)
Morocco	71 (1.3)	407 (4.7)	23 (1.1)	369 (6.9)	6 (0.5)	353 (7.3)	11.2 (0.05)
Netherlands	31 (1.1)	552 (2.7)	37 (0.8)	538 (2.9)	32 (1.2)	524 (2.5)	9.5 (0.05)
New Zealand	36 (1.0)	506 (3.9)	34 (0.9)	494 (3.7)	31 (1.0)	479 (3.2)	9.7 (0.05)
North Macedonia	67 (1.2)	488 (3.8)	24 (1.0)	469 (4.3)	9 (0.6)	467 (7.3)	11.1 (0.04)
Norway (5)	24 (0.9)	547 (3.2)	34 (0.8)	535 (2.6)	42 (1.0)	522 (2.4)	9.1 (0.04)
Oman	61 (0.9)	439 (4.6)	28 (0.8)	409 (4.8)	11 (0.5)	389 (5.3)	10.9 (0.03)
Poland	21 (0.9)	561 (3.9)	39 (0.8)	554 (2.6)	39 (1.1)	533 (2.3)	9.1 (0.05)
Portugal	46 (0.9)	534 (3.2)	35 (0.7)	510 (3.3)	20 (0.7)	496 (3.9)	10.2 (0.03)
Qatar	52 (1.1)	474 (3.7)	30 (0.8)	463 (4.4)	18 (0.8)	453 (5.1)	10.4 (0.04)
Romania	49 (1.7)	558 (4.4)	33 (1.2)	542 (5.9)	18 (1.1)	537 (7.3)	10.4 (0.07)
Saudi Arabia	62 (1.0)	438 (4.4)	25 (0.8)	417 (5.7)	13 (0.6)	399 (5.3)	10.9 (0.04)
Serbia	35 (1.3)	536 (4.8)	36 (1.3)	523 (3.0)	29 (1.1)	515 (3.8)	9.7 (0.05)
Singapore	33 (0.8)	641 (3.1)	35 (0.6)	616 (3.2)	31 (0.8)	587 (3.4)	9.6 (0.04)
Slovak Republic	35 (1.2)	522 (4.6)	36 (0.8)	517 (3.9)	29 (1.1)	510 (3.5)	9.7 (0.06)
Slovenia	31 (0.9)	529 (3.0)	38 (0.8)	517 (2.3)	31 (1.0)	502 (2.7)	9.5 (0.04)
South Africa (5)	53 (1.2)	380 (4.1)	35 (0.8)	341 (4.4)	12 (0.6)	345 (8.0)	10.6 (0.04)
Spain	38 (0.9)	512 (2.8)	37 (0.7)	497 (2.7)	25 (0.8)	485 (2.7)	9.9 (0.04)
Sweden	24 (1.0)	539 (4.5)	37 (1.0)	537 (3.4)	39 (1.2)	522 (2.9)	9.2 (0.05)
Türkiye (5)	51 (1.2)	566 (4.6)	32 (0.7)	540 (4.3)	17 (0.9)	544 (6.0)	10.4 (0.05)
United Arab Emirates	53 (0.5)	518 (1.5)	31 (0.3)	490 (1.9)	16 (0.3)	476 (2.0)	10.5 (0.02)
United States	39 (0.8)	540 (3.5)	33 (0.6)	519 (3.5)	28 (0.8)	497 (3.9)	9.8 (0.04)
Uzbekistan	80 (1.1)	456 (3.2)	15 (0.8)	414 (4.7)	5 (0.4)	400 (7.4)	11.6 (0.04)
International Average	44 (0.1)	519 (0.5)	32 (0.1)	501 (0.5)	24 (0.1)	487 (0.7)	
Benchmarking Participants							
Ontario, Canada	37 (1.0)	527 (4.0)	36 (0.9)	503 (4.2)	28 (1.0)	485 (4.4)	9.8 (0.04)
Quebec, Canada	44 (1.2)	528 (3.2)	37 (0.9)	515 (3.4)	19 (0.9)	494 (4.3)	10.2 (0.05)
Abu Dhabi, UAE	48 (0.9)	484 (2.5)	33 (0.6)	446 (2.8)	19 (0.6)	445 (3.6)	10.3 (0.04)
Dubai, UAE	51 (0.8)	573 (1.7)	32 (0.6)	551 (2.6)	17 (0.6)	530 (3.1)	10.4 (0.03)
Sharjah, UAE	58 (1.1)	520 (3.5)	28 (0.7)	497 (4.3)	13 (0.7)	474 (4.5)	10.8 (0.04)

This TIMSS context questionnaire scale was established in 2023 based on the combined response distribution of countries that participated in TIMSS 2023. To provide a point of reference for country comparisons, the scale centerpoint of 10 was located at the mean of the combined distribution. The units of the scale were chosen so that 2 scale score points corresponded to the standard deviation of the distribution.

() Standard errors appear in parentheses. Because of rounding some results may appear inconsistent.

An "r" indicates data are available for at least 70% but less than 85% of the students.

Exhibit 6.2.3: Students Like Learning Mathematics

Country	Very Much Like Learning Mathematics		Somewhat Like Learning Mathematics		Do Not Like Learning Mathematics		Average Scale Score
	Percent of Students	Average Achievement	Percent of Students	Average Achievement	Percent of Students	Average Achievement	
Australia	10 (0.6)	575 (5.7)	31 (0.9)	535 (4.2)	58 (1.0)	489 (3.8)	9.5 (0.05)
Austria	10 (0.6)	537 (4.7)	28 (0.9)	527 (3.7)	61 (0.9)	503 (2.4)	9.4 (0.04)
Azerbaijan	42 (1.2)	509 (4.7)	32 (0.8)	478 (4.8)	27 (1.0)	461 (4.4)	11.1 (0.05)
Bahrain	27 (0.9)	453 (4.2)	32 (0.9)	439 (3.4)	41 (1.1)	411 (3.1)	10.4 (0.05)
Brazil	18 (0.6)	393 (4.2)	33 (0.7)	391 (3.5)	49 (1.1)	377 (3.2)	10.0 (0.04)
Chile	17 (1.0)	449 (4.5)	35 (1.1)	423 (4.1)	48 (1.3)	405 (3.1)	10.1 (0.05)
Chinese Taipei	12 (0.6)	656 (5.0)	27 (0.8)	633 (3.6)	61 (1.0)	580 (3.4)	9.5 (0.04)
Cote d'Ivoire	50 (1.5)	265 (3.3)	39 (1.0)	260 (5.7)	11 (0.8)	267 (13.8)	11.7 (0.05)
Cyprus	16 (0.7)	539 (4.9)	29 (0.7)	516 (3.6)	55 (0.9)	477 (2.9)	9.6 (0.04)
Czech Republic	8 (0.5)	552 (5.5)	26 (0.7)	547 (3.0)	67 (1.0)	505 (2.3)	9.2 (0.04)
England	11 (0.9)	574 (8.0)	30 (0.9)	549 (5.4)	59 (1.5)	508 (4.7)	9.5 (0.06)
Finland	7 (0.4)	554 (7.1)	25 (0.7)	537 (3.9)	69 (0.9)	493 (2.2)	9.1 (0.04)
France	10 (0.6)	521 (5.0)	34 (1.0)	503 (4.2)	57 (1.2)	463 (3.3)	9.6 (0.05)
Georgia	25 (1.3)	501 (4.8)	38 (0.9)	475 (3.8)	37 (1.2)	446 (3.4)	10.5 (0.06)
Hong Kong SAR	18 (1.0)	614 (6.1)	38 (1.0)	586 (5.3)	44 (1.2)	554 (5.4)	10.1 (0.06)
Hungary	11 (0.5)	549 (7.2)	27 (0.9)	528 (4.8)	62 (1.2)	491 (3.5)	9.5 (0.04)
Iran, Islamic Rep. of	33 (1.0)	441 (5.3)	35 (0.6)	425 (4.0)	31 (1.0)	405 (3.3)	10.8 (0.05)
Ireland	11 (0.9)	566 (8.5)	30 (0.8)	544 (3.6)	59 (1.4)	505 (2.6)	9.5 (0.06)
Israel	16 (0.8)	504 (7.6)	31 (0.8)	501 (5.1)	53 (1.1)	480 (3.3)	9.7 (0.05)
Italy	11 (0.6)	559 (4.5)	28 (0.9)	527 (4.7)	61 (1.2)	479 (2.8)	9.4 (0.04)
Japan	10 (0.7)	656 (5.0)	31 (1.2)	619 (4.0)	59 (1.3)	571 (2.8)	9.7 (0.05)
Jordan	37 (1.1)	404 (4.3)	33 (0.7)	389 (3.6)	30 (1.0)	384 (3.5)	10.9 (0.06)
Kazakhstan	19 (0.8)	487 (5.7)	44 (0.8)	463 (3.9)	37 (1.0)	432 (3.6)	10.4 (0.04)
Korea, Rep. of	12 (0.6)	658 (5.4)	28 (0.7)	627 (4.2)	60 (0.8)	569 (3.1)	9.5 (0.04)
Kuwait	22 (0.8)	425 (8.2)	29 (0.9)	411 (7.1)	49 (1.1)	385 (4.1)	10.0 (0.05)
Lithuania	10 (0.5)	555 (5.7)	31 (0.9)	534 (4.2)	58 (1.1)	498 (3.1)	9.6 (0.04)
Malaysia	19 (0.6)	441 (5.2)	49 (0.7)	410 (3.4)	32 (0.8)	395 (3.5)	10.6 (0.03)
Malta	15 (0.6)	534 (4.0)	31 (0.7)	518 (2.7)	54 (0.7)	486 (1.7)	9.7 (0.03)
Morocco	42 (1.0)	390 (3.2)	35 (0.6)	375 (3.6)	23 (0.8)	366 (4.1)	11.2 (0.04)
Norway (9)	9 (0.4)	549 (5.4)	25 (0.7)	531 (2.6)	66 (0.9)	489 (2.4)	9.2 (0.04)
Oman	32 (1.0)	436 (3.1)	36 (0.7)	411 (3.3)	32 (1.0)	401 (3.6)	10.7 (0.05)
Palestinian Nat'l Auth.	37 (0.9)	406 (3.4)	30 (0.7)	381 (4.0)	33 (1.0)	376 (3.3)	10.8 (0.05)
Portugal	13 (0.6)	524 (4.0)	29 (0.9)	500 (2.9)	58 (1.1)	454 (3.1)	9.6 (0.04)
Qatar	25 (1.3)	479 (7.9)	31 (1.0)	472 (5.2)	43 (1.5)	429 (4.1)	10.2 (0.08)
Romania	20 (1.0)	523 (6.2)	33 (0.9)	506 (5.8)	47 (1.4)	490 (5.2)	10.1 (0.06)
Saudi Arabia	34 (1.0)	415 (4.1)	33 (0.7)	404 (3.7)	34 (1.1)	391 (3.5)	10.8 (0.05)
Singapore	24 (1.0)	650 (5.6)	37 (0.8)	619 (6.0)	39 (1.2)	566 (6.4)	10.4 (0.05)
South Africa (9)	38 (0.8)	402 (3.8)	41 (0.6)	388 (3.6)	21 (0.7)	400 (4.0)	11.2 (0.03)
Sweden	9 (0.5)	559 (6.9)	26 (1.1)	551 (3.8)	65 (1.3)	506 (2.1)	9.3 (0.05)
Türkiye	23 (0.9)	562 (6.5)	34 (1.0)	518 (5.5)	43 (1.2)	475 (4.2)	10.2 (0.05)
United Arab Emirates	30 (0.6)	511 (2.6)	34 (0.4)	501 (1.9)	36 (0.5)	472 (1.9)	10.6 (0.03)
United States	15 (0.7)	527 (6.3)	34 (0.9)	502 (4.5)	51 (1.2)	475 (3.9)	9.8 (0.04)
Uzbekistan	56 (1.2)	436 (5.0)	32 (0.9)	411 (4.7)	12 (0.8)	401 (5.1)	11.9 (0.04)
International Average	21 (0.1)	508 (0.8)	32 (0.1)	488 (0.7)	46 (0.2)	458 (0.6)	
Benchmarking Participants							
Abu Dhabi, UAE	27 (0.6)	477 (3.5)	34 (0.6)	465 (3.0)	39 (0.8)	449 (2.9)	10.4 (0.04)
Dubai, UAE	28 (1.1)	583 (4.1)	36 (0.7)	555 (2.9)	36 (0.9)	516 (3.1)	10.6 (0.04)
Sharjah, UAE	34 (1.7)	511 (6.4)	34 (1.3)	506 (6.1)	32 (1.5)	474 (4.2)	10.8 (0.08)

This TIMSS context questionnaire scale was established in 2023 based on the combined response distribution of countries that participated in TIMSS 2023. To provide a point of reference for country comparisons, the scale centerpoint of 10 was located at the mean of the combined distribution. The units of the scale were chosen so that 2 scale score points corresponded to the standard deviation of the distribution.

() Standard errors appear in parentheses. Because of rounding some results may appear inconsistent.

Students Confident in Mathematics

Students' confidence in mathematics has a strong positive relationship with mathematics achievement for both fourth- and eighth-grade students. In both grades, students who reported higher levels of confidence had much greater mathematics achievement than their less confident peers. The items in the TIMSS 2023 *Students Confident in Mathematics* scale (Exhibit 6.2.4) prompted students to indicate their agreement with different statements characterizing their perceptions of their mathematical abilities. Based on their responses, students were classified as “very confident,” “somewhat confident,” or “not confident” in mathematics.

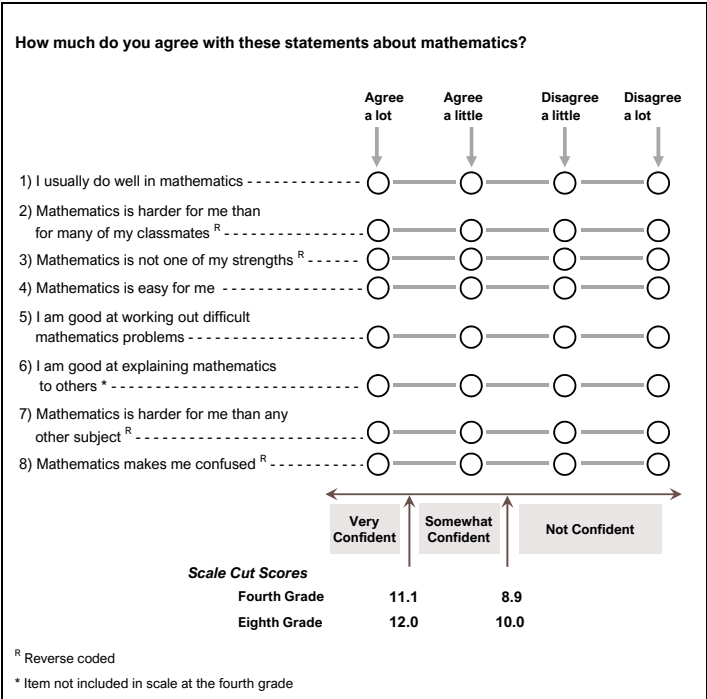
On average internationally, 27 percent of fourth-grade students reported being “very confident” in mathematics, 42 percent “somewhat confident,” and 31 percent “not confident.” There is a very strong relationship between self-reported confidence in mathematics and average mathematics achievement for fourth-grade students (Exhibit 6.2.5). Internationally, students who reported being “very confident” in mathematics had an average mathematics achievement score 87 points higher than students who reported they were “not confident” in mathematics (554 vs. 467). Average mathematics for students who reported being “somewhat confident” in mathematics was in between (506).

More than half (55%) of eighth-grade students reported feeling “not confident” in mathematics, on average (Exhibit 6.2.6). Only 13 percent of eighth-grade students reported feeling “very confident” in mathematics and 32 percent reported feeling “somewhat confident.” Internationally, the difference in average mathematics achievement between students who reported being “very confident” in mathematics and those who reported being “not confident” in mathematics was more than 100 points (555 vs. 446). Students who reported being “somewhat confident” in mathematics had an average achievement of 500.

Exhibit 6.2.4: Students Confident in Mathematics

About the Scale

Students were scored according to their responses to eight statements on the *Students Confident in Mathematics* scale. Cut scores divide the scale into three categories. Students **Very Confident in Mathematics** had a score at or above the cut score corresponding to “agreeing a lot” with four of the eight statements and “agreeing a little” with the other four, on average. Students who were **Not Confident in Mathematics** had a score at or below the cut score corresponding to “disagreeing a little” with four of the eight statements and “agreeing a little” with the other four, on average. All other students were **Somewhat Confident in Mathematics**.



SOURCE: IEA's Trends in International Mathematics and Science Study - TIMSS 2023
Downloaded from <https://timss2023.org/results>

Exhibit 6.2.5: Students Confident in Mathematics

Country	Very Confident in Mathematics		Somewhat Confident in Mathematics		Not Confident in Mathematics		Average Scale Score
	Percent of Students	Average Achievement	Percent of Students	Average Achievement	Percent of Students	Average Achievement	
Albania	36 (1.6)	543 (6.3)	39 (1.2)	511 (5.9)	26 (1.5)	484 (6.7)	10.5 (0.08)
Armenia	35 (0.9)	541 (2.7)	39 (0.9)	513 (3.2)	26 (1.1)	491 (4.3)	10.5 (0.05)
Australia	26 (0.9)	591 (3.4)	41 (0.8)	532 (3.1)	33 (0.9)	477 (3.3)	9.9 (0.05)
Azerbaijan	26 (1.0)	555 (3.8)	42 (0.8)	496 (3.7)	33 (1.0)	471 (3.4)	10.1 (0.04)
Bahrain	32 (1.1)	509 (5.1)	40 (0.8)	458 (4.5)	28 (1.1)	428 (5.0)	10.3 (0.05)
Belgium (Flemish)	28 (0.9)	565 (2.6)	42 (0.9)	526 (2.8)	29 (0.9)	481 (3.1)	10.0 (0.04)
Belgium (French)	34 (1.0)	532 (2.4)	41 (0.8)	484 (2.7)	25 (0.9)	448 (3.3)	10.3 (0.04)
Bosnia & Herzegovina	26 (1.1)	494 (3.6)	40 (1.6)	456 (4.6)	35 (1.5)	421 (3.9)	10.0 (0.06)
Brazil	17 (0.7)	465 (5.3)	41 (1.0)	416 (4.4)	42 (1.0)	385 (3.7)	9.6 (0.04)
Bulgaria	39 (1.3)	573 (3.6)	39 (0.9)	523 (4.1)	22 (1.0)	473 (6.8)	10.6 (0.06)
Canada	29 (0.6)	558 (2.3)	43 (0.6)	506 (2.1)	28 (0.6)	460 (2.5)	10.1 (0.03)
Chile	16 (0.8)	512 (3.3)	42 (0.9)	457 (3.2)	43 (1.0)	413 (3.2)	9.5 (0.04)
Chinese Taipei	18 (0.7)	653 (2.6)	39 (0.8)	616 (2.2)	44 (0.9)	583 (2.0)	9.4 (0.04)
Cyprus	41 (0.9)	559 (2.4)	37 (0.7)	506 (2.6)	22 (0.7)	462 (4.1)	10.7 (0.04)
Czech Republic	22 (0.8)	578 (2.9)	45 (0.7)	537 (2.5)	33 (0.9)	494 (3.1)	9.8 (0.03)
Denmark	23 (0.8)	572 (2.9)	45 (0.8)	529 (2.3)	33 (0.9)	487 (2.5)	9.8 (0.03)
England	28 (0.9)	614 (4.2)	39 (1.0)	564 (3.9)	33 (0.8)	500 (3.8)	9.9 (0.04)
Finland	31 (0.8)	574 (2.5)	47 (0.9)	529 (2.9)	23 (0.7)	483 (2.9)	10.2 (0.03)
France	33 (1.0)	528 (3.3)	41 (1.0)	484 (3.2)	27 (1.0)	439 (3.8)	10.3 (0.04)
Georgia	37 (1.1)	530 (3.2)	41 (0.9)	496 (4.1)	22 (1.0)	469 (3.7)	10.6 (0.05)
Germany	29 (0.9)	573 (2.4)	42 (0.8)	529 (2.3)	30 (0.9)	478 (3.3)	10.1 (0.04)
Hong Kong SAR	22 (0.9)	650 (4.2)	40 (0.9)	597 (4.1)	38 (1.0)	563 (4.5)	9.7 (0.06)
Hungary	30 (0.9)	582 (3.1)	42 (0.8)	518 (3.7)	28 (0.9)	471 (4.6)	10.2 (0.04)
Iran, Islamic Rep. of	29 (0.9)	465 (4.4)	43 (0.7)	419 (4.5)	28 (1.0)	385 (6.3)	10.2 (0.04)
Ireland	27 (0.8)	596 (3.1)	43 (1.1)	549 (3.3)	29 (1.1)	499 (3.7)	10.0 (0.04)
Italy	30 (1.0)	552 (2.9)	45 (0.9)	513 (3.2)	26 (1.0)	478 (3.9)	10.2 (0.05)
Japan	14 (0.5)	651 (3.4)	41 (0.9)	607 (2.6)	45 (1.0)	561 (2.7)	9.2 (0.03)
Jordan	28 (1.6)	469 (6.8)	39 (1.1)	421 (6.4)	33 (1.7)	409 (5.7)	10.2 (0.07)
Kazakhstan	25 (1.0)	536 (3.9)	51 (0.9)	488 (3.8)	24 (0.9)	449 (4.0)	10.2 (0.04)
Korea, Rep. of	22 (0.8)	644 (3.2)	43 (0.9)	606 (2.5)	34 (1.1)	549 (3.4)	9.7 (0.05)
Kosovo	31 (1.3)	498 (4.0)	41 (1.0)	447 (3.8)	27 (0.9)	419 (4.2)	10.3 (0.05)
Kuwait	27 (1.0)	434 (5.0)	44 (0.9)	390 (5.0)	29 (1.0)	358 (5.7)	10.2 (0.05)
Latvia	18 (0.9)	592 (4.6)	43 (1.1)	548 (2.8)	39 (1.0)	496 (3.3)	9.5 (0.04)
Lithuania	20 (0.8)	625 (2.9)	45 (1.0)	566 (3.0)	36 (1.0)	524 (3.3)	9.8 (0.03)
Macao SAR	28 (0.6)	628 (2.0)	38 (0.6)	585 (1.9)	34 (0.6)	542 (1.9)	10.0 (0.03)
Montenegro	36 (0.9)	515 (2.4)	36 (0.8)	474 (3.1)	28 (1.0)	447 (2.5)	10.5 (0.04)
Morocco	36 (1.4)	438 (5.8)	45 (1.0)	382 (5.2)	19 (0.9)	341 (4.9)	10.6 (0.05)
Netherlands	35 (1.0)	577 (1.9)	38 (1.1)	533 (2.8)	27 (0.9)	494 (3.1)	10.3 (0.04)
New Zealand	17 (0.7)	566 (4.5)	43 (0.9)	505 (3.0)	39 (1.0)	451 (2.5)	9.5 (0.03)
North Macedonia	30 (0.9)	525 (4.0)	39 (0.9)	478 (3.7)	31 (1.1)	444 (4.7)	10.3 (0.04)
Norway (5)	23 (0.7)	582 (2.8)	46 (0.9)	536 (2.3)	31 (0.9)	492 (2.9)	9.8 (0.03)
Oman	18 (0.9)	480 (5.7)	43 (0.7)	423 (4.8)	38 (1.1)	399 (3.7)	9.8 (0.04)
Poland	23 (0.8)	598 (2.7)	44 (0.7)	553 (2.4)	33 (1.1)	505 (2.5)	9.8 (0.04)
Portugal	22 (0.9)	575 (3.2)	38 (0.8)	530 (3.1)	39 (1.0)	476 (3.1)	9.7 (0.04)
Qatar	27 (0.8)	506 (4.1)	41 (0.7)	468 (3.8)	32 (0.9)	435 (4.0)	10.1 (0.03)
Romania	28 (1.3)	595 (5.0)	39 (1.1)	544 (5.0)	33 (1.1)	515 (5.2)	10.0 (0.06)
Saudi Arabia	23 (1.1)	469 (5.7)	42 (1.0)	423 (4.4)	35 (1.1)	407 (4.8)	10.0 (0.05)
Serbia	29 (1.0)	574 (4.0)	40 (1.1)	521 (3.8)	31 (1.1)	487 (3.4)	10.1 (0.05)
Singapore	23 (0.7)	681 (2.7)	36 (0.7)	631 (2.8)	41 (0.9)	567 (3.0)	9.6 (0.04)
Slovak Republic	28 (1.1)	563 (3.5)	42 (1.1)	510 (3.9)	30 (1.0)	481 (4.2)	10.1 (0.05)
Slovenia	29 (0.8)	561 (2.5)	42 (0.9)	517 (2.1)	29 (1.0)	471 (2.6)	10.1 (0.04)
South Africa (5)	20 (0.8)	439 (5.9)	48 (0.7)	354 (4.1)	31 (0.7)	325 (3.5)	9.9 (0.03)
Spain	23 (0.7)	554 (2.7)	42 (0.7)	502 (2.2)	35 (0.7)	463 (2.6)	9.8 (0.03)
Sweden	28 (0.8)	576 (3.4)	47 (0.6)	529 (3.0)	25 (0.7)	487 (3.4)	10.1 (0.04)
Türkiye (5)	25 (1.0)	616 (4.5)	40 (0.9)	554 (4.4)	36 (1.2)	511 (4.2)	9.8 (0.05)
United Arab Emirates	27 (0.4)	554 (1.7)	41 (0.4)	500 (1.5)	32 (0.4)	464 (1.8)	10.1 (0.02)
United States	28 (0.8)	590 (2.7)	39 (0.6)	521 (3.2)	32 (0.8)	464 (3.1)	10.0 (0.04)
Uzbekistan	40 (1.4)	481 (3.0)	37 (0.9)	433 (3.7)	23 (1.1)	406 (3.9)	10.8 (0.06)
International Average	27 (0.1)	554 (0.5)	42 (0.1)	506 (0.5)	31 (0.1)	467 (0.5)	
Benchmarking Participants							
Ontario, Canada	26 (1.1)	561 (4.2)	42 (1.1)	507 (3.7)	31 (1.0)	465 (3.8)	9.9 (0.05)
Quebec, Canada	34 (1.0)	560 (2.9)	44 (1.0)	510 (3.2)	22 (0.9)	463 (3.9)	10.4 (0.05)
Abu Dhabi, UAE	22 (0.6)	527 (3.2)	42 (0.6)	460 (2.4)	36 (0.8)	433 (2.5)	9.8 (0.03)
Dubai, UAE	30 (0.7)	605 (2.1)	43 (0.7)	556 (2.1)	28 (0.6)	514 (2.7)	10.2 (0.03)
Sharjah, UAE	30 (1.1)	548 (4.3)	40 (0.8)	504 (3.2)	30 (1.2)	473 (4.4)	10.3 (0.05)

This TIMSS context questionnaire scale was established in 2011 based on the combined response distribution of countries that participated in TIMSS 2011. To provide a point of reference for country comparisons, the scale centerpoint of 10 was located at the mean of the combined distribution. The units of the scale were chosen so that 2 scale score points corresponded to the standard deviation of the distribution.

() Standard errors appear in parentheses. Because of rounding some results may appear inconsistent.

An "r" indicates data are available for at least 70% but less than 85% of the students.

SOURCE: IEA's Trends in International Mathematics and Science Study - TIMSS 2023
Downloaded from <https://timss2023.org/results>



TIMSS & PIRLS
BOSTON COLLEGE

Exhibit 6.2.6: Students Confident in Mathematics

Country	Very Confident in Mathematics		Somewhat Confident in Mathematics		Not Confident in Mathematics		Average Scale Score
	Percent of Students	Average Achievement	Percent of Students	Average Achievement	Percent of Students	Average Achievement	
Australia	12 (0.6)	607 (4.2)	32 (0.7)	549 (3.3)	55 (0.9)	473 (3.4)	9.9 (0.04)
Austria	13 (0.6)	568 (3.6)	38 (0.8)	530 (3.2)	49 (0.9)	487 (2.6)	10.1 (0.03)
Azerbaijan	14 (0.7)	566 (6.0)	29 (0.8)	500 (5.1)	57 (0.9)	462 (3.8)	10.2 (0.04)
Bahrain	16 (0.7)	520 (4.3)	32 (0.7)	443 (2.8)	51 (0.8)	397 (2.9)	10.4 (0.03)
Brazil	7 (0.4)	488 (7.9)	23 (0.5)	412 (4.0)	70 (0.6)	367 (2.6)	9.5 (0.04)
Chile	10 (0.5)	509 (4.8)	28 (0.9)	446 (3.8)	62 (1.1)	393 (3.1)	9.9 (0.03)
Chinese Taipei	11 (0.5)	683 (5.1)	23 (0.6)	655 (3.4)	67 (0.9)	572 (3.1)	9.2 (0.05)
Cote d'Ivoire	7 (0.6)	305 (8.9)	44 (1.0)	266 (5.1)	49 (1.3)	255 (4.5)	10.2 (0.03)
Cyprus	18 (0.7)	577 (4.6)	31 (0.7)	519 (3.7)	51 (0.9)	460 (2.2)	10.2 (0.04)
Czech Republic	12 (0.5)	590 (3.4)	34 (0.7)	548 (2.7)	54 (0.9)	485 (2.5)	9.8 (0.04)
England	15 (1.1)	614 (5.0)	37 (1.0)	552 (4.7)	49 (1.6)	486 (4.3)	10.1 (0.06)
Finland	13 (0.6)	596 (3.2)	30 (0.7)	538 (3.4)	57 (0.9)	473 (2.2)	9.9 (0.04)
France	14 (0.7)	560 (3.8)	32 (0.9)	509 (3.8)	53 (1.1)	447 (3.2)	9.9 (0.05)
Georgia	15 (0.8)	547 (4.6)	32 (0.9)	492 (3.6)	53 (1.1)	436 (3.6)	10.2 (0.04)
Hong Kong SAR	9 (0.5)	651 (8.4)	28 (0.9)	609 (5.0)	63 (0.9)	552 (4.9)	9.7 (0.04)
Hungary	17 (0.7)	587 (3.9)	32 (0.7)	532 (3.8)	52 (1.0)	466 (3.6)	10.1 (0.04)
Iran, Islamic Rep. of	13 (0.6)	502 (6.2)	33 (0.7)	440 (4.4)	54 (0.9)	395 (3.2)	10.1 (0.04)
Ireland	12 (0.6)	595 (4.2)	35 (0.8)	547 (3.7)	53 (1.0)	490 (2.2)	9.9 (0.05)
Israel	20 (0.8)	562 (6.1)	34 (0.8)	500 (4.1)	46 (1.0)	454 (3.6)	10.4 (0.05)
Italy	17 (0.7)	574 (3.9)	31 (0.8)	530 (3.8)	52 (1.0)	463 (2.8)	9.9 (0.04)
Japan	4 (0.4)	695 (5.1)	21 (0.7)	649 (3.8)	74 (0.7)	574 (3.2)	9.1 (0.04)
Jordan	12 (0.6)	464 (5.2)	36 (1.0)	400 (4.1)	52 (1.0)	372 (3.4)	10.4 (0.03)
Kazakhstan	10 (0.6)	539 (6.9)	35 (0.8)	479 (3.9)	55 (1.0)	428 (3.5)	10.1 (0.04)
Korea, Rep. of	12 (0.5)	680 (5.2)	28 (0.8)	643 (3.4)	61 (0.9)	559 (3.2)	9.6 (0.04)
Kuwait	12 (0.7)	475 (8.5)	33 (1.0)	422 (6.6)	55 (1.3)	374 (4.8)	10.0 (0.04)
Lithuania	10 (0.4)	621 (4.9)	29 (0.8)	553 (3.6)	62 (0.9)	482 (2.9)	9.8 (0.04)
Malaysia	4 (0.3)	511 (8.0)	26 (0.6)	429 (4.4)	70 (0.7)	400 (3.1)	9.6 (0.02)
Malta	15 (0.6)	583 (3.6)	31 (0.7)	523 (2.4)	54 (0.8)	473 (2.0)	10.0 (0.03)
Morocco	14 (0.6)	433 (4.0)	39 (0.7)	382 (3.4)	48 (0.9)	363 (3.4)	10.4 (0.03)
Norway (9)	14 (0.6)	589 (2.7)	32 (0.8)	536 (2.7)	55 (0.9)	468 (2.0)	9.9 (0.04)
Oman	13 (0.5)	487 (4.3)	40 (0.7)	423 (3.0)	47 (0.8)	390 (3.1)	10.4 (0.03)
Palestinian Nat'l Auth.	14 (0.7)	464 (4.1)	32 (0.8)	393 (3.4)	54 (1.0)	367 (2.9)	10.4 (0.03)
Portugal	11 (0.5)	572 (2.9)	22 (0.7)	523 (2.6)	66 (0.9)	445 (2.7)	9.4 (0.04)
Qatar	17 (0.9)	518 (7.2)	33 (0.9)	477 (5.2)	49 (1.2)	421 (3.9)	10.4 (0.06)
Romania	10 (0.8)	604 (6.3)	26 (0.8)	529 (6.5)	64 (1.2)	475 (4.4)	9.8 (0.06)
Saudi Arabia	14 (0.7)	470 (4.6)	35 (0.7)	414 (3.8)	51 (1.1)	377 (2.8)	10.4 (0.04)
Singapore	16 (1.0)	676 (5.2)	31 (0.8)	638 (4.8)	53 (1.5)	567 (6.7)	10.0 (0.07)
South Africa (9)	10 (0.4)	451 (4.9)	35 (0.7)	403 (3.9)	55 (0.9)	382 (3.1)	9.9 (0.03)
Sweden	14 (0.7)	609 (4.0)	32 (0.8)	552 (2.7)	54 (1.1)	485 (2.1)	10.0 (0.05)
Türkiye	14 (0.6)	632 (5.8)	25 (0.8)	552 (5.7)	61 (1.1)	465 (3.6)	9.7 (0.05)
United Arab Emirates	18 (0.5)	567 (2.8)	33 (0.4)	509 (1.8)	49 (0.5)	458 (1.8)	10.5 (0.02)
United States	15 (0.7)	566 (6.3)	33 (0.7)	515 (4.3)	51 (1.0)	456 (3.6)	10.1 (0.04)
Uzbekistan	18 (1.1)	479 (7.9)	39 (0.9)	425 (4.7)	43 (1.2)	400 (3.3)	10.7 (0.06)
International Average	13 (0.1)	555 (0.8)	32 (0.1)	500 (0.6)	55 (0.2)	446 (0.5)	
Benchmarking Participants							
Abu Dhabi, UAE	14 (0.5)	547 (3.9)	32 (0.7)	481 (2.7)	54 (0.9)	430 (2.6)	10.3 (0.03)
Dubai, UAE	22 (1.0)	621 (3.6)	34 (0.6)	563 (2.8)	44 (1.0)	503 (3.0)	10.6 (0.04)
Sharjah, UAE	20 (1.3)	548 (7.0)	33 (0.8)	511 (4.7)	47 (1.5)	467 (4.9)	10.7 (0.07)

This TIMSS context questionnaire scale was established in 2011 based on the combined response distribution of countries that participated in TIMSS 2011. To provide a point of reference for country comparisons, the scale centerpoint of 10 was located at the mean of the combined distribution. The units of the scale were chosen so that 2 scale score points corresponded to the standard deviation of the distribution.

() Standard errors appear in parentheses. Because of rounding some results may appear inconsistent.
An "r" indicates data are available for at least 70% but less than 85% of the students.

SOURCE: IEA's Trends in International Mathematics and Science Study - TIMSS 2023
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Students Value Mathematics

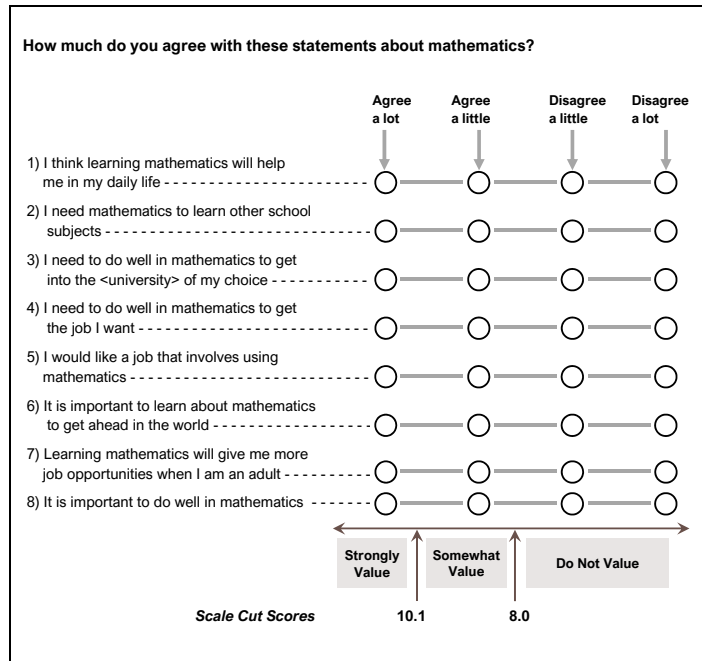
Students who value mathematics and see its relevance to their lives tend to have higher average achievement than those who do not. The items in the TIMSS 2023 *Students Value Mathematics* scale (Exhibit 6.2.7) asked eighth-grade students to indicate their level of agreement with eight statements about the value of mathematics. Based on their combined reports, students were classified into three groups: “strongly value,” “somewhat value,” or “do not value” mathematics.

Internationally, eighth-grade students tend to place at least some value on mathematics (Exhibit 6.2.8). Thirty-four percent of students reported that they “strongly value” mathematics, 41 percent reported that they “somewhat value” mathematics, and 24 percent reported that they “do not value” mathematics. There was a strong positive relationship between self-reported valuing of mathematics and average achievement in the subject area. Students who reported that they “strongly value” mathematics had an average mathematics achievement that was 40 points higher than those who “do not value” mathematics (494 vs. 454).

Exhibit 6.2.7: Students Value Mathematics

About the Scale

Students were scored according to their responses to eight statements on the *Students Value Mathematics* scale. Cut scores divide the scale into three categories. Students who **Strongly Value Mathematics** had a score at or above the cut score corresponding to “agreeing a lot” with four of the eight statements and “agreeing a little” with the other four, on average. Students who **Do Not Value Mathematics** had a score at or below the cut score corresponding to “disagreeing a little” with four of the eight statements and “agreeing a little” with the other four, on average. All other students **Somewhat Value Mathematics**.



SOURCE: IEA's Trends in International Mathematics and Science Study - TIMSS 2023
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Exhibit 6.2.8: Students Value Mathematics

Country	Strongly Value Mathematics		Somewhat Value Mathematics		Do Not Value Mathematics		Average Scale Score
	Percent of Students	Average Achievement	Percent of Students	Average Achievement	Percent of Students	Average Achievement	
Australia	29 (0.8)	542 (3.8)	45 (0.8)	513 (3.8)	26 (0.9)	485 (3.4)	9.1 (0.04)
Austria	12 (0.6)	522 (4.9)	43 (1.0)	514 (2.9)	45 (1.0)	513 (2.6)	8.3 (0.04)
Azerbaijan	52 (1.1)	499 (4.1)	34 (1.0)	479 (4.5)	14 (0.6)	464 (5.6)	10.1 (0.05)
Bahrain	42 (0.9)	449 (2.9)	35 (0.7)	434 (3.7)	23 (0.8)	401 (3.9)	9.6 (0.05)
Brazil	41 (0.9)	379 (2.8)	43 (0.8)	392 (2.6)	16 (0.7)	387 (6.6)	9.7 (0.04)
Chile	36 (1.0)	429 (3.7)	48 (0.8)	420 (3.2)	16 (0.8)	398 (4.6)	9.6 (0.04)
Chinese Taipei	18 (0.7)	642 (4.8)	41 (0.8)	620 (2.9)	41 (0.9)	569 (3.8)	8.4 (0.04)
Cote d'Ivoire	61 (1.4)	267 (5.0)	32 (1.1)	260 (5.2)	7 (0.5)	251 (8.1)	10.4 (0.06)
Cyprus	28 (0.8)	524 (4.9)	39 (0.9)	506 (3.6)	33 (0.9)	472 (2.7)	8.9 (0.04)
Czech Republic	14 (0.5)	536 (4.2)	52 (0.7)	524 (2.4)	34 (0.8)	505 (2.9)	8.6 (0.03)
England	29 (1.0)	549 (5.7)	46 (0.9)	534 (4.9)	26 (0.9)	503 (4.9)	9.1 (0.04)
Finland	17 (0.7)	538 (4.1)	46 (0.8)	516 (2.7)	37 (0.8)	485 (2.5)	8.5 (0.04)
France	23 (1.0)	500 (4.5)	48 (0.9)	487 (3.3)	28 (1.0)	464 (3.8)	8.9 (0.05)
Georgia	44 (1.2)	479 (3.5)	38 (1.0)	473 (4.1)	19 (0.8)	450 (4.1)	9.8 (0.05)
Hong Kong SAR	19 (0.9)	606 (7.5)	50 (0.9)	584 (6.0)	30 (1.1)	545 (5.1)	8.7 (0.05)
Hungary	24 (0.9)	533 (5.6)	47 (1.0)	506 (3.7)	29 (0.9)	488 (4.1)	8.9 (0.04)
Iran, Islamic Rep. of	42 (0.8)	429 (4.3)	36 (0.7)	424 (4.0)	21 (0.7)	414 (3.9)	9.6 (0.04)
Ireland	25 (0.9)	542 (4.6)	45 (1.1)	530 (2.3)	30 (1.3)	499 (4.5)	8.9 (0.04)
Israel	42 (1.1)	506 (5.4)	37 (0.7)	491 (3.7)	21 (0.8)	465 (4.6)	9.6 (0.05)
Italy	18 (0.8)	525 (5.1)	41 (0.9)	512 (3.0)	41 (1.1)	484 (3.4)	8.4 (0.05)
Japan	13 (0.7)	622 (5.4)	57 (0.9)	603 (3.3)	30 (0.9)	570 (3.2)	8.6 (0.03)
Jordan	53 (0.9)	401 (3.6)	31 (0.8)	386 (3.7)	16 (0.6)	380 (5.2)	10.1 (0.04)
Kazakhstan	26 (0.9)	468 (5.7)	46 (0.7)	455 (3.9)	28 (0.8)	446 (3.5)	9.1 (0.04)
Korea, Rep. of	23 (0.7)	635 (5.0)	49 (0.8)	604 (2.9)	28 (0.7)	551 (4.0)	8.9 (0.03)
Kuwait	38 (1.1)	414 (6.9)	39 (0.9)	404 (5.8)	23 (0.9)	379 (4.7)	9.4 (0.05)
Lithuania	22 (0.7)	538 (4.2)	46 (0.9)	521 (3.5)	32 (0.9)	495 (3.7)	8.8 (0.04)
Malaysia	35 (0.8)	431 (3.9)	50 (0.7)	409 (3.4)	15 (0.6)	374 (3.7)	9.5 (0.03)
Malta	31 (0.7)	519 (2.8)	42 (0.8)	508 (2.5)	27 (0.7)	487 (2.7)	9.1 (0.03)
Morocco	58 (0.8)	389 (3.3)	30 (0.7)	369 (3.6)	12 (0.5)	364 (4.6)	10.3 (0.04)
Norway (9)	22 (0.8)	529 (3.4)	47 (0.8)	514 (2.2)	31 (0.8)	479 (2.8)	8.8 (0.04)
Oman	46 (1.0)	432 (2.9)	37 (0.8)	411 (3.1)	16 (0.6)	384 (4.3)	9.8 (0.04)
Palestinian Nat'l Auth.	48 (0.9)	404 (3.0)	33 (0.7)	384 (3.7)	19 (0.6)	362 (3.9)	9.9 (0.05)
Portugal	27 (0.8)	499 (3.4)	43 (0.9)	481 (2.8)	30 (1.0)	449 (3.4)	9.0 (0.04)
Qatar	41 (1.3)	469 (5.7)	37 (1.0)	464 (4.3)	22 (1.1)	426 (5.1)	9.5 (0.07)
Romania	28 (1.2)	519 (6.2)	39 (1.1)	500 (5.4)	33 (1.3)	489 (5.5)	9.0 (0.06)
Saudi Arabia	50 (1.0)	412 (3.9)	35 (0.8)	403 (3.3)	15 (0.7)	380 (5.0)	10.0 (0.05)
Singapore	33 (1.0)	631 (6.0)	49 (0.9)	605 (6.1)	18 (0.7)	563 (7.4)	9.4 (0.04)
South Africa (9)	66 (0.7)	399 (3.2)	28 (0.6)	390 (4.0)	7 (0.3)	394 (6.7)	10.5 (0.03)
Sweden	19 (0.9)	546 (4.3)	49 (1.1)	531 (2.7)	33 (1.1)	501 (3.0)	8.7 (0.04)
Türkiye	38 (1.1)	539 (5.7)	38 (0.9)	505 (4.3)	24 (0.8)	470 (5.1)	9.4 (0.05)
United Arab Emirates	46 (0.5)	504 (2.4)	36 (0.4)	497 (1.7)	18 (0.4)	465 (2.3)	9.9 (0.02)
United States	28 (0.9)	509 (5.2)	47 (0.8)	494 (4.2)	25 (0.7)	472 (4.5)	9.1 (0.03)
Uzbekistan	71 (1.0)	430 (4.8)	23 (0.8)	412 (4.9)	7 (0.5)	401 (6.3)	11.1 (0.05)
International Average	34 (0.1)	494 (0.7)	41 (0.1)	478 (0.6)	24 (0.1)	454 (0.7)	
Benchmarking Participants							
Abu Dhabi, UAE	42 (0.9)	475 (3.4)	38 (0.7)	464 (2.8)	20 (0.6)	436 (3.3)	9.7 (0.04)
Dubai, UAE	43 (0.9)	566 (3.0)	39 (0.8)	548 (3.0)	18 (0.7)	513 (4.4)	9.8 (0.04)
Sharjah, UAE	51 (1.5)	503 (6.8)	34 (1.1)	501 (4.1)	15 (0.7)	471 (5.0)	10.1 (0.07)

This TIMSS context questionnaire scale was established in 2011 based on the combined response distribution of countries that participated in TIMSS 2011. To provide a point of reference for country comparisons, the scale centerpoint of 10 was located at the mean of the combined distribution. The units of the scale were chosen so that 2 scale score points corresponded to the standard deviation of the distribution.

() Standard errors appear in parentheses. Because of rounding some results may appear inconsistent.
An "r" indicates data are available for at least 70% but less than 85% of the students.

SOURCE: IEA's Trends in International Mathematics and Science Study - TIMSS 2023
Downloaded from <https://timss2023.org/results>

Students' Attitudes Toward Science

Students Like Learning Science

Students who enjoy learning science tend to have higher average science achievement in both fourth and eighth grades. In the TIMSS 2023 *Students Like Learning Science* scale items (Exhibit 6.3.1), students were asked to report the extent of their agreement with seven statements about attitudes toward studying science. In countries where eighth-grade students study separate science subjects, students responded to the items for each subject in which they were enrolled (biology, chemistry, physics, earth science). Based on their responses, students were classified in one of three categories: “very much like” learning science, “somewhat” like learning science, or “do not like” learning science.

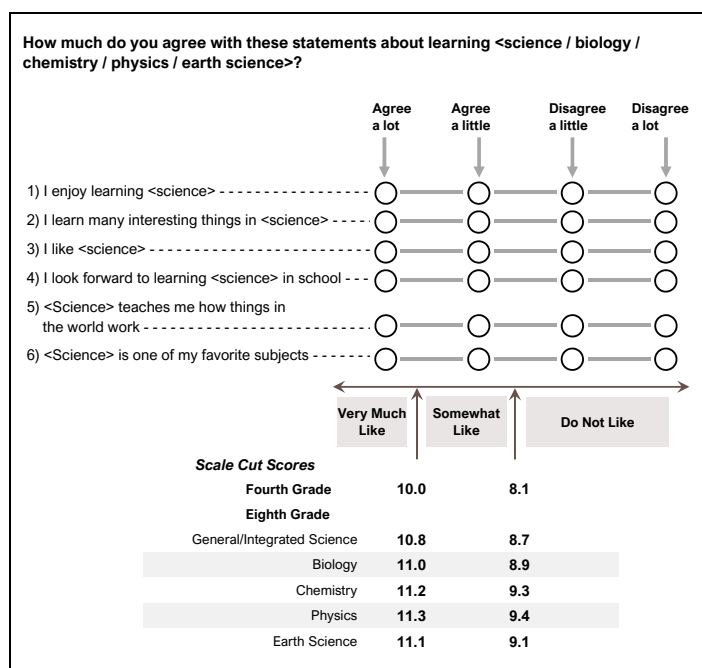
Exhibit 6.3.2 shows the results for the fourth grade. On average, internationally, about half of fourth-grade students reported that they “very much like” learning science (53%). Twenty-nine percent of fourth-grade students reported that they “somewhat like” learning science and 18 percent reported that they “do not like” learning science. In seven countries, 30 percent or more of students reported that they “do not like” learning science. In another 10 countries, less than 10 percent of students were in this category. For fourth-grade students internationally, there was a 22-point difference in average science achievement between students who “very much like” learning science and students who “do not like” learning science (504 vs. 482).

Results for eighth grade are presented for integrated science (Exhibit 6.3.3a) and for the separate science subjects (Exhibits 6.3.3b to 6.3.3e). Internationally and across science subjects, less than half of eighth-grade students reported that they “very much like” learning science. In integrated science, on average, 40 percent of students indicated that they “very much like” learning science, another 34 percent indicated that they “somewhat like” learning science, and 26 percent of students indicated that they “do not like” learning science. Students enrolled in separate science subjects were even less positive, with percentages in the “very much like” category ranging from 30 to 35 percent, on average. The difference in average science achievement between students who reported that they “very much like” learning science and students who reported that they “do not like” learning science is largest for eighth-grade students enrolled in integrated science, where there is a 43-point difference in average science achievement between students who “very much like” and “do not like” learning science (504 vs. 461). The difference in average achievement between eighth-grade students who reported that they “very much like” and reported that they “do not like” learning separate science subjects was smaller and varied across the four subjects—12 points for biology, 22 points for chemistry, 25 points for physics, and just 8 points for earth science.

Exhibit 6.3.1: Students Like Learning Science

About the Scale

Students were scored according to their responses to six statements on the *Students Like Learning Science* scale. Cut scores divide the scale into three categories. Students who **Very Much Like Learning Science** had a score at or above the cut score corresponding to “agreeing a lot” with three of the six statements and “agreeing a little” with the other three, on average. Students who **Do Not Like Learning Science** had a score at or below the cut score corresponding to “disagreeing a little” with three of the six statements and “agreeing a little” with the other three, on average. All other students **Somewhat Like Learning Science**. At the eighth grade, a comparable approach was used for biology, chemistry, physics, and earth science in countries where these were taught as separate subjects.



SOURCE: IEA's Trends in International Mathematics and Science Study - TIMSS 2023
Downloaded from <https://timss2023.org/results>

Exhibit 6.3.2: Students Like Learning Science

Country	Very Much Like Learning Science		Somewhat Like Learning Science		Do Not Like Learning Science		Average Scale Score
	Percent of Students	Average Achievement	Percent of Students	Average Achievement	Percent of Students	Average Achievement	
Albania	79 (1.0)	498 (4.4)	16 (0.9)	494 (6.9)	4 (0.6)	470 (14.0)	11.1 (0.04)
Armenia	71 (1.1)	467 (2.4)	20 (0.9)	454 (4.4)	9 (0.5)	445 (5.2)	10.9 (0.05)
Australia	44 (1.2)	558 (3.2)	33 (1.0)	556 (3.2)	23 (1.0)	544 (3.8)	9.7 (0.05)
Azerbaijan	68 (0.9)	438 (3.1)	21 (0.7)	414 (4.6)	11 (0.5)	402 (6.0)	10.7 (0.04)
Bahrain	73 (1.3)	487 (4.0)	17 (0.8)	464 (6.3)	10 (0.7)	445 (6.7)	10.9 (0.06)
Belgium (Flemish)	41 (1.0)	502 (3.3)	34 (0.9)	489 (3.0)	25 (1.0)	474 (4.4)	9.6 (0.04)
Belgium (French)	42 (1.2)	492 (3.1)	32 (0.9)	480 (3.5)	26 (1.0)	471 (3.9)	9.5 (0.05)
Bosnia & Herzegovina	43 (1.3)	449 (4.8)	33 (1.6)	459 (4.2)	24 (1.5)	464 (5.3)	9.6 (0.06)
Brazil	55 (1.1)	447 (3.8)	28 (0.8)	436 (5.1)	17 (1.1)	424 (5.9)	10.1 (0.05)
Bulgaria	68 (1.4)	534 (5.1)	22 (1.1)	526 (6.4)	9 (0.8)	522 (10.8)	10.7 (0.06)
Canada	49 (0.7)	531 (2.1)	31 (0.6)	526 (2.8)	20 (0.6)	510 (3.3)	9.9 (0.03)
Chile	52 (1.2)	481 (2.9)	31 (0.8)	489 (3.7)	17 (1.0)	483 (4.4)	10.1 (0.05)
Chinese Taipei	49 (1.2)	577 (2.1)	28 (0.8)	575 (2.3)	23 (1.0)	563 (3.2)	9.9 (0.06)
Cyprus	37 (1.2)	500 (4.3)	28 (0.8)	485 (4.2)	35 (1.4)	484 (3.3)	9.1 (0.07)
Czech Republic	34 (0.9)	530 (2.7)	34 (0.7)	531 (3.2)	32 (1.0)	521 (2.7)	9.3 (0.05)
Denmark	29 (1.1)	531 (3.3)	36 (0.8)	526 (3.5)	35 (1.4)	518 (2.9)	8.9 (0.06)
England	45 (1.3)	566 (3.6)	31 (0.9)	565 (4.0)	24 (1.0)	543 (3.6)	9.7 (0.05)
Finland	27 (0.8)	546 (3.7)	36 (0.8)	551 (3.6)	37 (0.9)	540 (3.2)	8.9 (0.04)
France	41 (1.1)	501 (3.5)	34 (0.9)	490 (3.5)	25 (1.3)	476 (4.5)	9.6 (0.06)
Georgia	61 (1.3)	476 (3.2)	29 (0.9)	462 (4.4)	10 (0.7)	460 (6.3)	10.4 (0.05)
Germany	45 (1.1)	525 (4.0)	34 (0.8)	520 (3.5)	21 (0.9)	506 (3.6)	9.8 (0.05)
Hong Kong SAR	53 (0.9)	554 (4.0)	30 (0.8)	545 (5.2)	18 (0.9)	523 (5.3)	10.1 (0.04)
Hungary	48 (1.2)	528 (3.7)	31 (0.8)	526 (4.0)	21 (0.8)	526 (4.2)	9.8 (0.05)
Iran, Islamic Rep. of	78 (0.9)	439 (4.5)	15 (0.7)	425 (7.0)	6 (0.4)	429 (9.3)	11.1 (0.04)
Ireland	45 (1.4)	537 (3.8)	34 (0.9)	536 (3.4)	21 (0.9)	519 (4.4)	9.7 (0.05)
Italy	52 (1.2)	516 (3.1)	30 (0.9)	512 (2.9)	18 (0.8)	501 (3.7)	10.0 (0.05)
Japan	46 (1.2)	563 (2.8)	34 (0.9)	552 (2.8)	20 (1.1)	549 (3.9)	9.8 (0.05)
Jordan	69 (1.6)	435 (5.4)	19 (1.1)	400 (7.0)	11 (0.8)	380 (7.0)	10.8 (0.07)
Kazakhstan	55 (1.1)	480 (3.7)	34 (0.9)	462 (3.9)	11 (0.6)	449 (6.0)	10.3 (0.04)
Korea, Rep. of	38 (1.0)	598 (3.2)	34 (0.8)	579 (3.2)	28 (1.0)	569 (3.1)	9.5 (0.04)
Kosovo	70 (1.2)	410 (3.8)	22 (1.0)	401 (4.9)	8 (0.7)	388 (7.7)	10.7 (0.04)
Kuwait	70 (1.4)	391 (5.4)	21 (0.9)	380 (8.9)	10 (0.8)	362 (10.7)	10.8 (0.06)
Latvia	33 (1.4)	525 (4.1)	39 (1.0)	531 (3.4)	28 (1.4)	527 (4.9)	9.2 (0.06)
Lithuania	41 (1.2)	539 (3.2)	36 (0.9)	539 (3.2)	22 (0.9)	540 (4.1)	9.6 (0.05)
Macao SAR	56 (0.6)	546 (1.7)	28 (0.6)	528 (2.3)	16 (0.5)	512 (3.0)	10.2 (0.03)
Montenegro	59 (1.1)	469 (2.1)	27 (0.8)	459 (3.4)	15 (0.8)	464 (4.1)	10.3 (0.05)
Morocco	76 (1.2)	405 (5.6)	18 (0.9)	356 (7.7)	6 (0.5)	351 (8.7)	11.0 (0.05)
Netherlands	39 (1.3)	529 (3.5)	34 (0.8)	518 (4.0)	27 (1.4)	504 (3.4)	9.4 (0.06)
New Zealand	45 (1.1)	531 (3.0)	31 (0.9)	522 (4.4)	24 (0.9)	507 (3.5)	9.6 (0.05)
North Macedonia	68 (0.9)	454 (4.1)	22 (0.7)	443 (4.7)	10 (0.6)	436 (6.2)	10.7 (0.04)
Norway (5)	32 (1.2)	540 (3.3)	38 (0.9)	534 (3.1)	30 (1.2)	524 (3.4)	9.2 (0.05)
Oman	69 (0.8)	454 (4.4)	22 (0.6)	417 (4.8)	9 (0.4)	376 (6.4)	10.8 (0.03)
Poland	33 (1.2)	551 (3.5)	37 (1.0)	550 (2.8)	30 (1.4)	552 (2.8)	9.1 (0.06)
Portugal	72 (1.0)	516 (2.3)	20 (0.8)	503 (3.8)	8 (0.5)	494 (6.5)	10.8 (0.04)
Qatar	65 (0.9)	488 (3.7)	22 (0.9)	464 (4.8)	13 (0.5)	442 (6.1)	10.6 (0.04)
Romania	57 (1.3)	532 (4.7)	29 (1.1)	537 (4.8)	14 (1.2)	535 (7.4)	10.3 (0.06)
Saudi Arabia	71 (1.0)	452 (4.2)	19 (0.6)	413 (4.7)	11 (0.6)	392 (6.8)	10.9 (0.05)
Serbia	48 (1.3)	512 (3.7)	32 (1.1)	510 (3.8)	19 (0.9)	514 (3.5)	9.8 (0.05)
Singapore	51 (0.9)	614 (3.0)	31 (0.6)	608 (3.4)	18 (0.6)	590 (3.8)	10.0 (0.04)
Slovak Republic	38 (1.4)	518 (5.0)	37 (1.0)	527 (4.3)	25 (1.2)	525 (5.1)	9.5 (0.06)
Slovenia	36 (1.0)	531 (3.1)	37 (0.9)	528 (2.6)	27 (0.9)	525 (3.1)	9.4 (0.04)
South Africa (5)	57 (1.0)	328 (5.4)	29 (0.7)	286 (7.1)	13 (0.6)	261 (10.1)	10.2 (0.04)
Spain	50 (1.2)	511 (2.4)	32 (0.7)	503 (2.6)	18 (0.9)	499 (3.6)	9.9 (0.05)
Sweden	29 (1.2)	528 (5.3)	36 (0.9)	545 (3.5)	35 (1.3)	530 (3.5)	9.0 (0.06)
Türkiye (5)	71 (1.2)	575 (3.6)	21 (0.9)	560 (5.2)	8 (0.6)	564 (6.8)	10.8 (0.05)
United Arab Emirates	69 (0.5)	519 (1.8)	21 (0.4)	473 (2.9)	10 (0.3)	440 (3.5)	10.8 (0.02)
United States	55 (1.0)	546 (2.9)	27 (0.6)	533 (3.6)	18 (0.7)	520 (4.3)	10.2 (0.04)
Uzbekistan	77 (1.1)	425 (3.5)	16 (0.9)	388 (4.9)	7 (0.6)	362 (6.4)	11.1 (0.05)
International Average	53 (0.1)	504 (0.5)	29 (0.1)	493 (0.6)	18 (0.1)	482 (0.8)	
Benchmarking Participants							
Ontario, Canada	47 (1.3)	536 (2.9)	33 (1.0)	530 (4.5)	20 (1.0)	515 (5.5)	9.8 (0.06)
Quebec, Canada	49 (1.5)	513 (2.9)	28 (1.0)	512 (3.6)	23 (1.2)	500 (3.8)	9.9 (0.06)
Abu Dhabi, UAE	61 (1.0)	480 (2.6)	25 (0.7)	424 (3.7)	14 (0.5)	392 (5.0)	10.4 (0.04)
Dubai, UAE	70 (0.8)	575 (2.1)	21 (0.7)	550 (3.4)	8 (0.3)	525 (4.7)	10.9 (0.03)
Sharjah, UAE	76 (1.2)	520 (3.8)	17 (0.9)	476 (5.2)	7 (0.5)	451 (6.0)	11.1 (0.05)

This TIMSS context questionnaire scale was established in 2023 based on the combined response distribution of countries that participated in TIMSS 2023. To provide a point of reference for country comparisons, the scale centerpoint of 10 was located at the mean of the combined distribution. The units of the scale were chosen so that 2 scale score points corresponded to the standard deviation of the distribution.

() Standard errors appear in parentheses. Because of rounding some results may appear inconsistent.

An "r" indicates data are available for at least 70% but less than 85% of the students.

SOURCE: IEA's Trends in International Mathematics and Science Study - TIMSS 2023
Downloaded from <https://timss2023.org/results>

Exhibit 6.3.3: Students Like Learning Science

The general/integrated science panel summarizes responses for countries where students are enrolled in science as a single subject. The following panels for biology, chemistry, physics, and earth science summarize responses for countries where students are taught science as separate subjects.

Exhibit 6.3.3a: Students Like Learning General/Integrated Science

General/Integrated Science	Very Much Like Learning Science		Somewhat Like Learning Science		Do Not Like Learning Science		Average Scale Score
	Percent of Students	Average Achievement	Percent of Students	Average Achievement	Percent of Students	Average Achievement	
Australia	24 (0.8)	557 (5.0)	39 (0.8)	534 (3.2)	38 (1.0)	498 (3.9)	9.4 (0.05)
Bahrain	51 (1.1)	476 (2.8)	29 (0.7)	454 (3.2)	21 (0.9)	427 (4.9)	10.5 (0.05)
Brazil	50 (0.7)	430 (2.6)	33 (0.6)	430 (3.1)	16 (0.6)	417 (3.8)	10.6 (0.03)
Chile	27 (1.3)	463 (3.6)	42 (1.1)	459 (3.2)	30 (1.4)	457 (3.4)	9.7 (0.06)
Chinese Taipei	21 (0.8)	604 (4.5)	38 (1.0)	581 (3.0)	41 (1.1)	549 (2.8)	9.3 (0.05)
England	22 (0.9)	571 (6.9)	40 (1.1)	546 (4.7)	39 (1.3)	505 (5.1)	9.3 (0.05)
Hong Kong SAR	35 (1.2)	558 (5.1)	43 (1.0)	525 (5.0)	23 (1.0)	497 (6.8)	10.1 (0.05)
Iran, Islamic Rep. of	54 (1.0)	428 (4.2)	30 (0.7)	411 (4.4)	15 (0.8)	407 (4.4)	10.7 (0.04)
Ireland	28 (1.9)	562 (4.8)	36 (0.7)	539 (4.5)	36 (1.9)	509 (3.9)	9.5 (0.09)
Israel	25 (1.0)	499 (6.0)	32 (0.9)	490 (4.2)	43 (1.5)	474 (3.6)	9.2 (0.07)
Italy	30 (1.1)	518 (3.7)	39 (0.8)	505 (3.4)	32 (1.1)	485 (4.1)	9.7 (0.05)
Japan	18 (0.9)	590 (4.8)	38 (1.1)	571 (2.9)	44 (1.4)	534 (3.5)	9.2 (0.05)
Jordan	57 (1.2)	429 (4.0)	26 (0.7)	410 (4.9)	16 (0.8)	399 (5.0)	10.8 (0.05)
Korea, Rep. of	22 (0.9)	586 (4.0)	34 (0.9)	557 (3.5)	44 (1.1)	517 (2.5)	9.3 (0.05)
Kuwait	55 (1.3)	437 (6.2)	27 (0.7)	419 (6.0)	18 (1.1)	406 (6.6)	10.7 (0.06)
Malaysia	43 (0.9)	445 (4.1)	43 (0.6)	423 (3.7)	13 (0.6)	383 (5.5)	10.5 (0.03)
Norway (9)	18 (0.7)	527 (4.3)	38 (0.9)	504 (2.6)	44 (1.1)	474 (3.2)	9.1 (0.04)
Oman	57 (1.0)	476 (2.7)	28 (0.6)	454 (3.3)	16 (0.6)	432 (4.7)	10.8 (0.04)
Palestinian Nat'l Auth.	53 (1.1)	412 (3.2)	27 (0.7)	398 (3.6)	21 (0.9)	379 (4.3)	10.5 (0.06)
Qatar	47 (1.6)	502 (5.5)	30 (1.1)	490 (5.5)	23 (1.3)	451 (5.0)	10.4 (0.07)
Saudi Arabia	58 (1.2)	433 (3.7)	25 (0.7)	427 (4.2)	16 (0.8)	423 (5.4)	10.9 (0.05)
Singapore	44 (1.1)	632 (5.6)	40 (0.8)	598 (5.8)	16 (0.7)	558 (8.0)	10.5 (0.04)
South Africa (9)	49 (0.9)	373 (4.2)	35 (0.6)	351 (4.4)	16 (0.6)	351 (5.8)	10.6 (0.03)
Türkiye	58 (1.2)	543 (3.6)	29 (0.9)	518 (4.4)	13 (0.9)	504 (6.6)	10.8 (0.05)
United Arab Emirates	54 (0.7)	509 (2.6)	29 (0.4)	492 (2.3)	17 (0.4)	452 (2.9)	10.7 (0.03)
United States	34 (1.1)	533 (4.4)	39 (0.7)	520 (4.0)	27 (0.9)	496 (3.9)	9.9 (0.05)
International Average	40 (0.2)	504 (0.9)	34 (0.2)	485 (0.8)	26 (0.2)	461 (0.9)	
Benchmarking Participants							
Abu Dhabi, UAE	49 (1.2)	478 (4.4)	30 (0.7)	453 (3.7)	21 (0.9)	412 (4.5)	10.5 (0.06)
Dubai, UAE	51 (1.2)	567 (3.3)	33 (0.9)	546 (3.8)	16 (0.7)	515 (4.0)	10.7 (0.04)
Sharjah, UAE	63 (1.8)	513 (6.8)	25 (1.1)	494 (6.3)	12 (0.9)	464 (5.9)	11.1 (0.07)

Separate Science Results

Exhibit 6.3.3b: Students Like Learning Biology

Biology	Very Much Like Learning Biology		Somewhat Like Learning Biology		Do Not Like Learning Biology		Average Scale Score
	Percent of Students	Average Achievement	Percent of Students	Average Achievement	Percent of Students	Average Achievement	
Austria	22 (1.0)	529 (4.3)	35 (1.0)	515 (3.1)	43 (1.4)	503 (3.3)	9.4 (0.06)
Azerbaijan	44 (1.0)	422 (3.9)	32 (0.8)	417 (3.7)	24 (1.0)	420 (3.9)	10.4 (0.05)
Cote d'Ivoire	64 (1.5)	177 (5.6)	28 (1.1)	167 (9.6)	9 (0.6)	178 (13.6)	11.2 (0.05)
Cyprus	29 (0.9)	490 (3.9)	33 (0.8)	471 (3.8)	39 (1.0)	456 (4.0)	9.6 (0.05)
Czech Republic	21 (1.0)	539 (2.9)	40 (0.7)	530 (2.5)	39 (1.1)	525 (2.4)	9.5 (0.05)
Finland	13 (0.6)	560 (5.5)	37 (0.8)	546 (3.6)	50 (1.1)	531 (3.3)	9.0 (0.04)
France	19 (1.0)	492 (4.8)	39 (1.1)	493 (3.6)	42 (1.5)	490 (3.4)	9.4 (0.06)
Georgia	45 (1.0)	462 (3.3)	34 (0.8)	455 (3.2)	21 (1.0)	445 (4.1)	10.5 (0.05)
Hungary	27 (1.1)	525 (4.4)	35 (0.7)	518 (3.8)	39 (1.2)	525 (3.5)	9.7 (0.05)
Kazakhstan	36 (1.1)	458 (3.6)	45 (0.9)	440 (3.5)	19 (0.9)	445 (4.3)	10.4 (0.04)
Lithuania	27 (1.1)	524 (3.9)	39 (0.8)	518 (3.7)	34 (1.2)	524 (3.3)	9.7 (0.05)
Morocco	47 (1.1)	335 (4.3)	31 (0.8)	325 (3.9)	21 (0.9)	320 (4.4)	10.6 (0.05)
Portugal	38 (1.2)	519 (2.7)	40 (0.9)	504 (3.0)	22 (1.0)	495 (3.3)	10.3 (0.05)
Romania	41 (1.8)	472 (4.8)	34 (1.0)	473 (4.7)	25 (1.4)	479 (5.1)	10.3 (0.08)
Sweden	17 (0.8)	548 (6.1)	34 (1.0)	538 (3.3)	48 (1.2)	523 (3.4)	9.2 (0.04)
Uzbekistan	66 (1.3)	399 (4.0)	26 (1.0)	402 (4.6)	8 (0.5)	401 (7.0)	11.4 (0.04)
International Average	35 (0.3)	466 (1.1)	35 (0.2)	457 (1.1)	30 (0.3)	454 (1.3)	
Malta	- -	- -	- -	- -	- -	- -	- -

This TIMSS context questionnaire scale was established in 2023 based on the combined response distribution of countries that participated in TIMSS 2023. To provide a point of reference for country comparisons, the scale centerpoint of 10 was located at the mean of the combined distribution. The units of the scale were chosen so that 2 scale score points corresponded to the standard deviation of the distribution. The separate scales for biology, chemistry, physics, and earth science were each established in 2023 using a comparable approach.

() Standard errors appear in parentheses. Because of rounding some results may appear inconsistent.

An "r" indicates data are available for at least 70% but less than 85% of the students.

A "y" indicates data are available for less than 40% of the students.

A dash (-) indicates comparable data not available.

Exhibit 6.3.3: Students Like Learning Science

Separate Science Results

(Continued)

Exhibit 6.3.3c: Students Like Learning Chemistry

Chemistry		Very Much Like Learning Chemistry		Somewhat Like Learning Chemistry		Do Not Like Learning Chemistry		Average Scale Score
Country		Percent of Students	Average Achievement	Percent of Students	Average Achievement	Percent of Students	Average Achievement	
Austria		18 (0.9)	532 (4.2)	31 (1.0)	518 (3.5)	51 (1.5)	507 (3.6)	9.4 (0.06)
Azerbaijan	r	37 (1.2)	421 (4.0)	28 (0.8)	415 (3.8)	35 (1.3)	422 (3.7)	10.1 (0.06)
Cote d'Ivoire		66 (1.1)	188 (8.6)	27 (0.9)	177 (8.8)	7 (0.5)	174 (12.2)	11.5 (0.04)
Cyprus		36 (0.9)	486 (3.2)	32 (1.0)	474 (5.3)	32 (1.0)	456 (4.2)	10.3 (0.04)
Czech Republic		17 (0.9)	542 (3.6)	32 (0.9)	535 (2.4)	50 (1.5)	522 (2.6)	9.5 (0.06)
Finland	r	14 (0.6)	587 (6.1)	31 (0.9)	550 (3.8)	55 (1.2)	526 (2.9)	9.2 (0.05)
France		18 (1.0)	513 (4.7)	33 (1.1)	500 (3.8)	49 (1.5)	482 (3.7)	9.5 (0.06)
Georgia		44 (1.4)	467 (3.3)	30 (0.9)	453 (3.6)	27 (1.3)	440 (3.8)	10.6 (0.06)
Hungary		18 (0.9)	535 (5.4)	29 (1.0)	524 (4.4)	53 (1.6)	519 (3.2)	9.4 (0.06)
Kazakhstan		29 (1.0)	465 (4.1)	43 (0.8)	442 (3.4)	28 (1.1)	448 (3.9)	10.3 (0.04)
Lithuania		23 (0.9)	538 (4.4)	34 (0.9)	523 (3.8)	43 (1.4)	513 (2.9)	9.7 (0.06)
Morocco	r	51 (1.0)	339 (3.8)	31 (0.8)	324 (4.2)	18 (0.8)	310 (4.0)	11.0 (0.04)
Portugal		29 (1.2)	531 (3.5)	36 (0.9)	510 (2.5)	35 (1.4)	488 (3.0)	10.0 (0.06)
Romania	r	30 (1.8)	477 (4.6)	30 (1.2)	470 (4.9)	40 (1.8)	477 (4.3)	9.9 (0.09)
Sweden	r	16 (0.8)	555 (6.6)	31 (0.9)	548 (4.9)	53 (1.1)	520 (3.4)	9.4 (0.04)
Uzbekistan		61 (1.3)	399 (4.4)	28 (1.0)	397 (4.3)	11 (0.7)	415 (4.9)	11.4 (0.05)
International Average		32 (0.3)	473 (1.2)	32 (0.2)	460 (1.1)	37 (0.3)	451 (1.2)	
Malta	y	--	--	--	--	--	--	--

Exhibit 6.3.3d: Students Like Learning Physics

Physics		Very Much Like Learning Physics		Somewhat Like Learning Physics		Do Not Like Learning Physics		Average Scale Score
Country		Percent of Students	Average Achievement	Percent of Students	Average Achievement	Percent of Students	Average Achievement	
Austria		16 (0.9)	531 (4.9)	28 (1.2)	517 (3.9)	56 (1.6)	509 (3.3)	9.3 (0.06)
Azerbaijan	r	43 (1.3)	430 (3.5)	30 (0.9)	413 (4.4)	27 (1.1)	412 (3.7)	10.7 (0.06)
Cote d'Ivoire		65 (1.3)	187 (7.8)	27 (0.9)	178 (8.4)	8 (0.7)	185 (18.4)	11.6 (0.04)
Cyprus	r	28 (0.8)	490 (4.0)	30 (0.9)	474 (4.5)	41 (1.1)	460 (3.8)	9.9 (0.05)
Czech Republic		13 (0.7)	549 (4.1)	28 (0.8)	538 (2.6)	58 (1.2)	521 (2.2)	9.3 (0.05)
Finland	r	11 (0.6)	580 (7.8)	28 (0.9)	556 (3.9)	60 (1.2)	532 (3.0)	9.1 (0.05)
France		18 (1.0)	513 (4.7)	33 (1.1)	500 (3.8)	49 (1.5)	482 (3.7)	9.6 (0.06)
Georgia		33 (1.4)	472 (3.9)	35 (1.1)	451 (4.6)	33 (1.3)	445 (3.4)	10.3 (0.07)
Hungary		17 (0.8)	537 (5.5)	28 (0.9)	527 (4.5)	54 (1.3)	517 (2.8)	9.4 (0.06)
Kazakhstan		30 (1.0)	469 (4.6)	44 (0.9)	442 (2.9)	26 (0.9)	445 (4.1)	10.5 (0.04)
Lithuania		19 (0.8)	540 (5.6)	31 (0.9)	521 (3.9)	50 (1.3)	516 (3.1)	9.5 (0.05)
Malta	r	33 (0.8)	540 (3.0)	32 (0.8)	512 (3.4)	34 (0.8)	483 (3.3)	10.2 (0.03)
Morocco	r	51 (1.0)	338 (3.7)	31 (0.8)	321 (4.1)	18 (0.8)	314 (4.5)	11.1 (0.04)
Portugal		29 (1.2)	531 (3.5)	36 (0.9)	510 (2.5)	35 (1.4)	488 (3.0)	10.1 (0.06)
Romania	r	29 (1.6)	477 (5.3)	31 (1.3)	474 (4.5)	40 (1.8)	475 (3.9)	10.0 (0.08)
Sweden	r	15 (0.9)	567 (5.6)	30 (1.0)	539 (4.9)	55 (1.3)	523 (3.2)	9.4 (0.05)
Uzbekistan		63 (1.3)	401 (4.1)	27 (1.0)	398 (4.7)	11 (0.8)	405 (5.5)	11.6 (0.05)
International Average		30 (0.3)	479 (1.2)	31 (0.2)	463 (1.1)	39 (0.3)	454 (1.4)	

Exhibit 6.3.3e: Students Like Learning Earth Science

Earth Science		Very Much Like Learning Earth Science		Somewhat Like Learning Earth Science		Do Not Like Learning Earth Science		Average Scale Score
Country		Percent of Students	Average Achievement	Percent of Students	Average Achievement	Percent of Students	Average Achievement	
Austria		19 (0.9)	519 (4.4)	32 (1.0)	514 (3.0)	49 (1.4)	512 (3.2)	9.3 (0.07)
Azerbaijan	r	47 (1.3)	423 (3.5)	29 (1.0)	418 (4.1)	24 (1.0)	419 (4.2)	10.6 (0.06)
Cote d'Ivoire		69 (1.3)	188 (6.5)	25 (1.0)	176 (12.2)	6 (0.5)	180 (23.1)	11.5 (0.04)
Cyprus	r	21 (0.8)	470 (4.4)	28 (0.9)	471 (5.5)	51 (1.2)	464 (2.9)	9.2 (0.05)
Czech Republic		24 (0.9)	529 (3.3)	34 (0.8)	529 (2.4)	42 (1.2)	530 (2.4)	9.7 (0.05)
Finland		14 (0.7)	562 (5.3)	38 (0.8)	548 (3.2)	48 (1.0)	529 (3.2)	9.3 (0.04)
France		19 (1.0)	492 (4.8)	39 (1.1)	493 (3.6)	42 (1.5)	490 (3.4)	9.5 (0.06)
Georgia		39 (1.5)	458 (3.7)	35 (1.0)	456 (3.7)	26 (1.3)	451 (3.3)	10.4 (0.06)
Hungary		22 (1.0)	528 (4.5)	32 (0.9)	519 (4.2)	46 (1.3)	523 (3.4)	9.5 (0.06)
Kazakhstan		30 (1.2)	463 (4.5)	45 (0.8)	442 (2.9)	24 (1.1)	447 (5.1)	10.3 (0.05)
Lithuania		28 (1.0)	523 (4.1)	37 (0.8)	520 (3.8)	35 (1.2)	524 (3.5)	9.9 (0.05)
Morocco	r	46 (1.1)	337 (4.0)	32 (0.7)	321 (4.0)	22 (0.9)	321 (4.3)	10.7 (0.05)
Portugal		38 (1.2)	519 (2.7)	40 (0.9)	504 (3.0)	22 (1.0)	495 (3.3)	10.5 (0.05)
Uzbekistan		57 (1.4)	396 (4.5)	31 (1.1)	403 (4.3)	12 (0.7)	408 (5.1)	11.2 (0.05)
International Average		34 (0.3)	458 (1.2)	34 (0.2)	451 (1.3)	32 (0.3)	450 (1.9)	
Malta	x	25 (1.1)	517 (5.1)	32 (1.3)	505 (4.3)	43 (1.2)	496 (4.3)	9.6 (0.05)
Romania	y	--	--	--	--	--	--	--
Sweden		--	--	--	--	--	--	--

This TIMSS context questionnaire scale was established in 2023 based on the combined response distribution of countries that participated in TIMSS 2023. To provide a point of reference for country comparisons, the scale centerpoint of 10 was located at the mean of the combined distribution. The units of the scale were chosen so that 2 scale score points corresponded to the standard deviation of the distribution. The separate scales for biology, chemistry, physics, and earth science were each established in 2023 using a comparable approach.

() Standard errors appear in parentheses. Because of rounding some results may appear inconsistent.

An "r" indicates data are available for at least 70% but less than 85% of the students.

An "x" indicates data are available for at least 40% but less than 50% of the students—interpret with caution. A "y" indicates data are available for less than 40% of the students.

A dash (-) indicates comparable data not available.

SOURCE: IEA's Trends in International Mathematics and Science Study - TIMSS 2023
Downloaded from <https://timss2023.org/results>

Students Confident in Science

Students who are confident in science have much greater average achievement in the subject than their peers who are not confident in science. The items in the TIMSS 2023 *Students Confident in Science* scale (Exhibit 6.3.4) asked students to indicate their level of agreement with different statements about their confidence in science. In countries where eighth-grade science is taught as separate subjects, students responded to the statements for each subject in which they were enrolled. Students were grouped into three categories based on their responses: “very confident,” “somewhat confident,” or “not confident.”

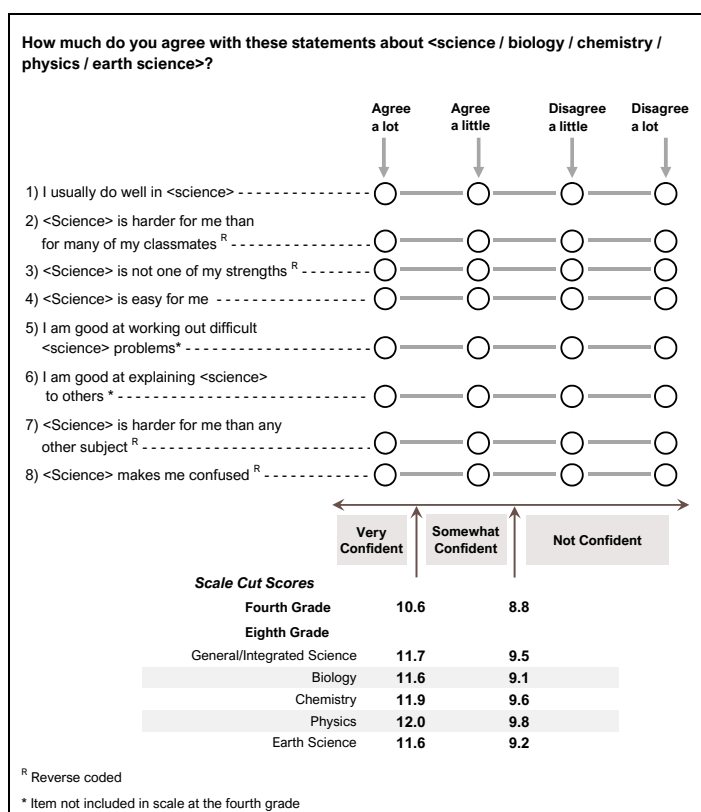
Fourth-grade students were relatively evenly distributed internationally across the three scale categories (Exhibit 6.3.5). On average, about one-third of fourth-grade students were “very confident” in science (34%), about one-third were “somewhat confident” in science (35%), and about one-third were “not confident” in science (31%). There was a strong positive relationship internationally between feeling confident in science and average achievement in the subject area for fourth-grade students—a difference in average scale score of 67 points between students who are “very confident” and those who are “not confident” (530 vs. 463).

Across the science subjects, less than one-fifth of eighth-grade students on average were “very confident” in science, both for integrated science and the separate subjects, with percentages in this category ranging from 12 percent in physics to 17 percent in integrated science, biology and earth science (Exhibit 6.3.6a – 6.3.6e). Physics and chemistry had the most students, on average, who reported being “not confident” in the subjects (53% and 50%, respectively), although more than 30% of eighth-grade students fell into this category for all science subjects. The difference in average achievement between “very confident” and “not confident” students was largest in integrated science, where students who were “very confident” had an average achievement of 545 and students who were “not confident” had an average achievement of 455 (a difference of 90 points). Although still substantial, average achievement differences between students who were “very confident” and “not confident” were smaller for the separate science subjects, ranging from 64 points in earth science (495 vs. 431) to 83 points in physics (525 vs. 442).

Exhibit 6.3.4: Students Confident in Science

About the Scale

Students were scored according to their responses to eight statements on the *Students Confident in Science* scale. Cut scores divide the scale into three categories. Students **Very Confident in Science** had a score at or above the cut score corresponding to “agreeing a lot” with four of the eight statements and “agreeing a little” with the other four, on average. Students who were **Not Confident in Science** had a score at or below the cut score corresponding to “disagreeing a little” with four of the eight statements and “agreeing a little” with the other four, on average. All other students were **Somewhat Confident in Science**. At the eighth grade, a comparable approach was used for biology, chemistry, physics, and earth science in countries where these were taught as separate subjects.



SOURCE: IEA's Trends in International <science> and Science Study - TIMSS 2023
Downloaded from <https://timss2023.org/results>

Exhibit 6.3.5: Students Confident in Science

Country	Very Confident in Science		Somewhat Confident in Science		Not Confident in Science		Average Scale Score
	Percent of Students	Average Achievement	Percent of Students	Average Achievement	Percent of Students	Average Achievement	
Albania	49 (2.1)	516 (4.7)	25 (1.2)	489 (6.0)	26 (1.9)	465 (5.9)	10.6 (0.09)
Armenia	41 (1.4)	481 (2.8)	28 (0.9)	457 (3.3)	31 (1.2)	440 (3.4)	10.3 (0.06)
Australia	29 (1.1)	584 (3.7)	40 (1.0)	558 (3.1)	31 (1.0)	520 (3.2)	9.8 (0.04)
Azerbaijan	35 (1.2)	462 (3.7)	30 (0.9)	419 (4.0)	35 (1.0)	401 (3.7)	10.1 (0.05)
Bahrain	47 (1.6)	514 (4.9)	25 (1.0)	473 (4.6)	28 (1.3)	431 (4.6)	10.6 (0.07)
Belgium (Flemish)	30 (1.0)	521 (3.7)	39 (0.9)	497 (2.4)	31 (1.0)	454 (3.3)	9.8 (0.05)
Belgium (French)	29 (0.9)	517 (2.3)	37 (0.9)	486 (3.5)	34 (1.1)	451 (4.0)	9.8 (0.04)
Bosnia & Herzegovina	23 (1.2)	483 (3.8)	34 (1.9)	460 (4.1)	43 (1.9)	435 (5.3)	9.4 (0.07)
Brazil	21 (1.1)	485 (4.2)	33 (0.6)	446 (4.0)	46 (1.1)	412 (4.1)	9.4 (0.05)
Bulgaria	56 (1.6)	564 (3.4)	28 (1.1)	505 (7.6)	16 (1.1)	463 (8.6)	11.1 (0.07)
Canada	34 (0.7)	554 (2.1)	38 (0.6)	526 (2.8)	28 (0.8)	490 (2.6)	10.0 (0.03)
Chile	20 (0.8)	524 (3.7)	35 (0.9)	493 (3.2)	45 (1.1)	457 (3.1)	9.4 (0.04)
Chinese Taipei	38 (1.1)	602 (2.2)	35 (0.7)	569 (2.4)	27 (0.9)	541 (3.0)	10.2 (0.05)
Cyprus	28 (1.2)	529 (4.4)	29 (0.8)	493 (3.1)	43 (1.1)	463 (3.6)	9.5 (0.07)
Czech Republic	28 (1.0)	550 (2.6)	39 (0.8)	531 (2.9)	32 (0.9)	503 (3.2)	9.8 (0.04)
Denmark	31 (1.0)	551 (3.2)	42 (0.8)	524 (3.1)	26 (1.1)	494 (3.8)	9.9 (0.04)
England	29 (0.9)	586 (4.4)	39 (0.9)	565 (3.5)	32 (1.0)	533 (3.5)	9.7 (0.04)
Finland	31 (0.9)	573 (3.1)	43 (0.9)	549 (2.8)	26 (0.9)	509 (4.0)	9.9 (0.04)
France	28 (1.2)	526 (3.4)	37 (1.0)	493 (3.8)	34 (1.1)	461 (3.9)	9.7 (0.05)
Georgia	36 (1.2)	490 (3.6)	33 (0.9)	470 (4.1)	31 (1.1)	446 (5.2)	10.2 (0.06)
Germany	41 (1.1)	551 (3.2)	35 (0.8)	517 (3.4)	23 (0.9)	468 (5.2)	10.4 (0.05)
Hong Kong SAR	25 (0.8)	584 (4.4)	38 (1.0)	549 (4.3)	36 (1.1)	517 (4.6)	9.7 (0.04)
Hungary	41 (0.9)	557 (3.4)	33 (0.8)	520 (3.6)	26 (0.9)	491 (4.6)	10.4 (0.05)
Iran, Islamic Rep. of	51 (1.1)	472 (4.0)	26 (0.7)	419 (5.8)	23 (0.7)	376 (5.6)	10.8 (0.05)
Ireland	31 (0.9)	558 (3.6)	43 (1.0)	536 (3.7)	26 (1.0)	498 (5.0)	9.9 (0.04)
Italy	39 (1.0)	532 (2.6)	37 (0.9)	510 (2.7)	24 (0.8)	487 (3.8)	10.3 (0.04)
Japan	33 (1.0)	576 (2.7)	47 (0.9)	556 (3.1)	20 (0.8)	527 (4.3)	10.1 (0.04)
Jordan	36 (1.9)	461 (6.2)	27 (0.9)	412 (5.9)	37 (1.7)	390 (5.0)	10.1 (0.09)
Kazakhstan	33 (1.1)	502 (3.8)	40 (0.9)	465 (4.0)	26 (0.8)	436 (4.4)	10.2 (0.04)
Korea, Rep. of	27 (0.8)	615 (3.2)	43 (0.8)	585 (2.9)	29 (1.0)	552 (3.7)	9.8 (0.04)
Kosovo	34 (1.2)	439 (3.9)	30 (0.9)	403 (4.4)	36 (1.2)	376 (4.4)	9.9 (0.05)
Kuwait	42 (1.7)	420 (6.5)	28 (1.2)	385 (6.4)	30 (1.3)	340 (7.5)	10.4 (0.07)
Latvia	25 (1.2)	559 (4.2)	39 (1.2)	535 (3.1)	36 (1.2)	497 (4.1)	9.6 (0.05)
Lithuania	22 (0.8)	570 (2.9)	39 (1.0)	546 (3.4)	39 (1.2)	514 (3.5)	9.5 (0.04)
Macao SAR	40 (0.7)	558 (2.0)	33 (0.7)	535 (2.2)	27 (0.5)	504 (2.5)	10.2 (0.03)
Montenegro	36 (1.0)	493 (2.0)	29 (0.8)	464 (3.1)	35 (1.0)	437 (2.8)	10.1 (0.05)
Morocco	45 (1.5)	437 (6.1)	29 (0.9)	379 (6.0)	26 (1.2)	331 (6.1)	10.6 (0.07)
Netherlands	32 (1.1)	546 (3.6)	40 (1.1)	516 (3.8)	27 (1.1)	489 (3.4)	10.0 (0.05)
New Zealand	18 (0.8)	560 (4.4)	42 (1.0)	533 (3.2)	39 (1.1)	493 (3.4)	9.4 (0.04)
North Macedonia	30 (1.1)	491 (3.7)	28 (1.1)	449 (4.6)	42 (1.3)	418 (4.7)	9.8 (0.05)
Norway (5)	33 (1.3)	557 (3.4)	45 (1.0)	531 (3.0)	22 (0.9)	502 (3.8)	10.0 (0.04)
Oman	30 (1.1)	483 (4.5)	29 (0.8)	434 (5.7)	41 (1.3)	410 (4.4)	9.8 (0.05)
Poland	32 (1.2)	574 (2.7)	43 (0.9)	552 (2.4)	25 (1.0)	521 (3.7)	10.0 (0.05)
Portugal	44 (1.1)	536 (2.2)	32 (0.9)	507 (3.0)	23 (0.9)	473 (3.5)	10.5 (0.04)
Qatar	39 (1.0)	515 (3.6)	29 (0.8)	476 (4.6)	32 (1.0)	432 (5.1)	10.2 (0.05)
Romania	35 (1.5)	556 (4.8)	33 (1.0)	532 (5.0)	32 (1.5)	509 (5.6)	10.1 (0.07)
Saudi Arabia	36 (1.4)	480 (4.7)	26 (0.8)	434 (5.4)	38 (1.3)	404 (4.0)	10.1 (0.07)
Serbia	35 (1.3)	539 (3.6)	32 (1.0)	511 (3.8)	33 (1.3)	482 (3.5)	10.0 (0.06)
Singapore	27 (0.6)	642 (3.0)	35 (0.6)	614 (3.0)	38 (0.6)	579 (3.4)	9.6 (0.03)
Slovak Republic	32 (1.1)	555 (3.3)	37 (1.0)	518 (5.0)	31 (1.3)	494 (5.8)	10.0 (0.05)
Slovenia	31 (0.8)	562 (2.8)	38 (0.8)	532 (2.7)	32 (0.9)	492 (3.0)	9.9 (0.04)
South Africa (5)	27 (0.8)	401 (6.6)	34 (0.7)	302 (6.3)	38 (0.9)	245 (5.0)	9.8 (0.04)
Spain	30 (0.9)	536 (2.4)	35 (0.7)	510 (2.2)	35 (0.8)	477 (2.7)	9.8 (0.04)
Sweden	33 (0.9)	561 (3.9)	44 (0.8)	538 (3.0)	24 (1.0)	494 (5.0)	10.0 (0.04)
Türkiye (5)	46 (1.4)	598 (3.6)	31 (0.9)	561 (3.9)	23 (1.1)	529 (5.0)	10.6 (0.06)
United Arab Emirates	42 (0.6)	548 (1.8)	30 (0.4)	498 (2.3)	28 (0.4)	437 (2.4)	10.4 (0.02)
United States	38 (0.8)	572 (3.0)	33 (0.7)	538 (3.0)	28 (0.8)	493 (3.6)	10.2 (0.04)
Uzbekistan	45 (1.6)	445 (3.1)	24 (0.9)	401 (4.6)	31 (1.4)	381 (4.4)	10.6 (0.07)
International Average	34 (0.2)	530 (0.5)	35 (0.1)	497 (0.5)	31 (0.1)	463 (0.6)	
Benchmarking Participants							
Ontario, Canada	32 (1.1)	560 (3.3)	39 (1.2)	529 (4.2)	29 (1.4)	500 (3.9)	9.9 (0.06)
Quebec, Canada	35 (1.2)	536 (3.0)	37 (1.0)	511 (3.3)	28 (1.2)	475 (3.4)	10.1 (0.05)
Abu Dhabi, UAE	33 (1.1)	523 (3.0)	31 (0.6)	447 (3.6)	36 (0.9)	395 (3.1)	10.0 (0.05)
Dubai, UAE	47 (0.8)	594 (2.0)	33 (0.6)	561 (2.4)	21 (0.6)	510 (3.2)	10.6 (0.03)
Sharjah, UAE	48 (1.6)	541 (3.6)	27 (1.1)	502 (4.2)	25 (1.1)	451 (5.5)	10.7 (0.07)

This TIMSS context questionnaire scale was established in 2011 based on the combined response distribution of countries that participated in TIMSS 2011. To provide a point of reference for country comparisons, the scale centerpoint of 10 was located at the mean of the combined distribution. The units of the scale were chosen so that 2 scale score points corresponded to the standard deviation of the distribution.

() Standard errors appear in parentheses. Because of rounding some results may appear inconsistent.

An "r" indicates data are available for at least 70% but less than 85% of the students.

SOURCE: IEA's Trends in International Science and Science Study - TIMSS 2023
Downloaded from <https://timss2023.org/results>



TIMSS & PIRLS
BOSTON COLLEGE

Exhibit 6.3.6: Students Confident in Science

The general/integrated science panel summarizes responses for countries where students are enrolled in science as a single subject. The following panels for biology, chemistry, physics, and earth science summarize responses for countries where students are taught science as separate subjects.

Exhibit 6.3.6a: Students Confident in General/Integrated Science

Country	Very Confident in Science		Somewhat Confident in Science		Not Confident in Science		Average Scale Score
	Percent of Students	Average Achievement	Percent of Students	Average Achievement	Percent of Students	Average Achievement	
Australia	11 (0.5)	594 (5.4)	37 (0.8)	550 (3.2)	51 (0.9)	494 (3.4)	9.7 (0.04)
Bahrain	24 (0.8)	522 (3.6)	38 (0.9)	466 (3.4)	38 (1.1)	415 (3.1)	10.6 (0.04)
Brazil	14 (0.5)	477 (4.8)	41 (0.7)	436 (3.2)	45 (0.8)	406 (2.6)	10.1 (0.03)
Chile	4 (0.4)	515 (8.8)	40 (1.2)	469 (3.6)	56 (1.3)	449 (2.7)	9.6 (0.03)
Chinese Taipei	10 (0.4)	646 (3.9)	26 (0.7)	610 (3.6)	64 (0.9)	547 (2.5)	9.1 (0.05)
England	12 (0.8)	612 (6.7)	36 (1.1)	560 (4.9)	52 (1.2)	506 (4.2)	9.6 (0.05)
Hong Kong SAR	12 (0.8)	587 (6.5)	34 (1.0)	555 (4.7)	54 (1.4)	502 (5.1)	9.8 (0.06)
Iran, Islamic Rep. of	25 (0.9)	471 (4.0)	40 (0.7)	418 (4.0)	35 (1.0)	385 (3.7)	10.6 (0.05)
Ireland	15 (0.8)	601 (4.8)	39 (0.9)	555 (3.3)	46 (1.1)	496 (4.1)	9.8 (0.06)
Israel	19 (0.9)	549 (4.2)	36 (0.8)	499 (4.0)	44 (1.3)	446 (3.4)	10.2 (0.06)
Italy	18 (0.8)	542 (3.9)	47 (0.8)	508 (3.3)	35 (1.0)	476 (3.7)	10.2 (0.04)
Japan	5 (0.4)	635 (5.7)	24 (0.9)	599 (3.5)	72 (1.1)	539 (3.1)	8.8 (0.07)
Jordan	18 (1.0)	485 (5.4)	38 (0.9)	418 (3.9)	44 (1.2)	394 (4.3)	10.3 (0.05)
Korea, Rep. of	9 (0.5)	623 (3.9)	25 (0.8)	579 (3.4)	66 (1.0)	523 (2.5)	9.0 (0.04)
Kuwait	29 (1.1)	471 (6.8)	40 (0.9)	426 (5.5)	30 (1.3)	386 (7.0)	10.9 (0.07)
Malaysia	8 (0.4)	488 (5.1)	43 (0.7)	438 (4.0)	49 (0.9)	409 (3.6)	9.8 (0.02)
Norway (9)	13 (0.6)	563 (3.8)	43 (0.8)	512 (2.7)	43 (0.9)	461 (3.1)	10.0 (0.03)
Oman	23 (0.7)	524 (3.4)	42 (0.7)	461 (2.6)	35 (0.8)	427 (3.4)	10.6 (0.03)
Palestinian Nat'l Auth.	16 (0.7)	469 (3.8)	38 (0.6)	402 (3.3)	46 (0.9)	378 (3.2)	10.3 (0.04)
Qatar	22 (1.2)	540 (6.7)	38 (1.0)	494 (5.1)	40 (1.3)	450 (4.0)	10.5 (0.07)
Saudi Arabia	23 (0.9)	476 (4.2)	38 (0.8)	429 (4.1)	39 (1.1)	403 (4.0)	10.6 (0.05)
Singapore	16 (0.7)	660 (5.1)	38 (0.8)	622 (6.2)	46 (1.1)	575 (6.1)	10.0 (0.05)
South Africa (9)	17 (0.8)	408 (4.7)	44 (0.6)	361 (4.8)	40 (1.0)	344 (4.2)	10.2 (0.04)
Türkiye	33 (1.2)	588 (3.6)	37 (0.8)	524 (3.7)	29 (1.1)	477 (4.1)	11.0 (0.06)
United Arab Emirates	25 (0.6)	557 (2.8)	37 (0.4)	509 (2.1)	38 (0.6)	442 (2.2)	10.7 (0.03)
United States	18 (0.9)	570 (5.5)	40 (0.9)	529 (4.3)	41 (1.2)	485 (3.9)	10.2 (0.05)
International Average	17 (0.2)	545 (1.0)	38 (0.2)	497 (0.8)	45 (0.2)	455 (0.8)	
Benchmarking Participants							
Abu Dhabi, UAE	20 (1.1)	543 (3.5)	36 (0.6)	475 (3.3)	44 (1.2)	403 (3.3)	10.4 (0.06)
Dubai, UAE	27 (1.0)	603 (3.3)	40 (1.0)	558 (3.0)	33 (1.1)	504 (3.6)	10.7 (0.05)
Sharjah, UAE	32 (1.8)	545 (8.0)	36 (1.0)	513 (5.8)	33 (1.3)	451 (4.0)	11.1 (0.11)

Separate Science Results

Exhibit 6.3.6b: Students Confident in Biology

Country	Very Confident in Biology		Somewhat Confident in Biology		Not Confident in Biology		Average Scale Score
	Percent of Students	Average Achievement	Percent of Students	Average Achievement	Percent of Students	Average Achievement	
Austria	21 (0.8)	549 (3.5)	51 (1.0)	516 (2.6)	28 (1.2)	484 (4.1)	10.3 (0.05)
Azerbaijan	13 (0.7)	465 (5.0)	36 (0.9)	424 (3.9)	51 (1.2)	408 (3.2)	9.7 (0.04)
Cote d'Ivoire	16 (1.1)	250 (14.1)	50 (1.0)	167 (5.4)	34 (0.9)	150 (6.3)	10.1 (0.05)
Cyprus	20 (0.7)	527 (3.5)	35 (0.9)	480 (4.4)	45 (0.9)	440 (3.6)	9.9 (0.04)
Czech Republic	17 (0.7)	562 (2.8)	50 (0.7)	531 (2.1)	33 (0.9)	512 (2.3)	10.0 (0.04)
Finland	11 (0.6)	602 (4.5)	45 (0.7)	555 (3.2)	44 (0.9)	512 (3.6)	9.7 (0.04)
France	14 (0.9)	523 (4.9)	43 (1.3)	506 (3.4)	43 (1.6)	472 (3.8)	9.7 (0.07)
Georgia	24 (1.1)	490 (4.5)	42 (1.1)	455 (3.5)	34 (1.1)	432 (3.7)	10.4 (0.06)
Hungary	23 (1.0)	552 (3.3)	44 (0.9)	520 (3.3)	33 (1.0)	507 (4.4)	10.3 (0.06)
Kazakhstan	16 (0.8)	490 (4.8)	49 (0.9)	448 (3.5)	35 (1.1)	429 (3.5)	10.1 (0.05)
Lithuania	14 (0.9)	565 (4.6)	43 (0.8)	527 (3.2)	43 (1.0)	503 (3.8)	9.8 (0.05)
Morocco	12 (0.6)	372 (5.5)	40 (0.8)	328 (3.6)	47 (1.0)	318 (3.9)	9.7 (0.04)
Portugal	17 (0.8)	560 (3.9)	46 (0.9)	516 (2.6)	37 (1.1)	474 (2.6)	10.0 (0.04)
Romania	16 (1.1)	516 (5.2)	39 (1.4)	473 (4.7)	45 (1.7)	463 (4.6)	9.9 (0.07)
Sweden	12 (0.7)	597 (5.5)	45 (0.9)	551 (3.4)	43 (1.0)	500 (3.3)	9.7 (0.05)
Uzbekistan	24 (1.1)	427 (5.1)	40 (1.0)	397 (4.1)	36 (1.1)	385 (4.0)	10.5 (0.07)
International Average	17 (0.2)	503 (1.4)	44 (0.2)	462 (0.9)	39 (0.3)	437 (1.0)	
Malta	- -	- -	- -	- -	- -	- -	- -

This TIMSS context questionnaire scale was established in 2011 based on the combined response distribution of countries that participated in TIMSS 2011. To provide a point of reference for country comparisons, the scale centerpoint of 10 was located at the mean of the combined distribution. The units of the scale were chosen so that 2 scale score points corresponded to the standard deviation of the distribution. The separate scales for biology, chemistry, physics, and earth science were each established in 2011 using a comparable approach.

() Standard errors appear in parentheses. Because of rounding some results may appear inconsistent.

An "r" indicates data are available for at least 70% but less than 85% of the students.

A "y" indicates data are available for less than 40% of the students.

A dash (-) indicates comparable data not available.

Exhibit 6.3.6: Students Confident in Science

Separate Science Results

(Continued)

Exhibit 6.3.6c: Students Confident in Chemistry

Chemistry		Very Confident in Chemistry		Somewhat Confident in Chemistry		Not Confident in Chemistry		Average Scale Score
Country		Percent of Students	Average Achievement	Percent of Students	Average Achievement	Percent of Students	Average Achievement	
Austria		12 (0.6)	567 (4.4)	39 (1.0)	528 (2.9)	49 (1.2)	493 (3.1)	9.9 (0.05)
Azerbaijan	r	7 (0.6)	464 (6.7)	26 (1.0)	419 (5.0)	67 (1.1)	416 (3.0)	9.6 (0.05)
Cote d'Ivoire		18 (1.2)	254 (18.8)	51 (0.9)	178 (7.1)	31 (1.0)	153 (5.4)	10.6 (0.06)
Cyprus	r	25 (0.9)	523 (3.2)	35 (0.9)	476 (4.0)	40 (1.0)	440 (4.4)	10.8 (0.05)
Czech Republic		11 (0.6)	574 (3.6)	40 (1.2)	540 (2.2)	49 (1.5)	511 (2.5)	9.8 (0.06)
Finland	r	10 (0.6)	629 (4.2)	31 (1.0)	566 (3.7)	60 (1.2)	517 (2.8)	9.5 (0.05)
France		15 (0.9)	546 (4.0)	37 (1.0)	510 (3.3)	48 (1.4)	466 (3.7)	10.0 (0.06)
Georgia		20 (1.0)	499 (5.2)	37 (0.9)	455 (3.4)	43 (1.0)	435 (3.1)	10.5 (0.06)
Hungary		13 (0.6)	572 (4.0)	35 (1.1)	525 (3.7)	52 (1.4)	510 (3.4)	9.8 (0.06)
Kazakhstan	r	11 (0.7)	499 (5.8)	40 (0.8)	452 (3.7)	50 (1.1)	439 (3.2)	10.0 (0.04)
Lithuania		11 (0.7)	588 (4.3)	34 (0.8)	533 (3.7)	55 (1.2)	502 (3.1)	9.8 (0.05)
Morocco	r	13 (0.7)	387 (5.4)	41 (0.9)	329 (3.4)	46 (1.0)	313 (3.9)	10.2 (0.03)
Portugal		13 (0.7)	578 (3.8)	32 (0.8)	526 (2.7)	54 (1.1)	480 (2.4)	9.9 (0.05)
Romania	r	9 (0.7)	539 (5.8)	29 (1.1)	480 (4.3)	62 (1.3)	464 (4.2)	9.6 (0.06)
Sweden	s	11 (0.7)	614 (6.4)	39 (1.1)	557 (4.4)	51 (1.4)	503 (3.3)	9.9 (0.05)
Uzbekistan		16 (1.1)	428 (6.2)	37 (0.9)	397 (4.0)	47 (1.1)	392 (3.9)	10.5 (0.06)
International Average		13 (0.2)	516 (1.7)	36 (0.2)	467 (1.0)	50 (0.3)	440 (0.9)	
Malta	y	--	--	--	--	--	--	--

Exhibit 6.3.6d: Students Confident in Physics

Physics		Very Confident in Physics		Somewhat Confident in Physics		Not Confident in Physics		Average Scale Score
Country		Percent of Students	Average Achievement	Percent of Students	Average Achievement	Percent of Students	Average Achievement	
Austria		11 (0.6)	568 (4.9)	38 (1.1)	528 (3.7)	51 (1.2)	495 (3.0)	10.0 (0.05)
Azerbaijan	r	10 (0.6)	479 (5.3)	28 (0.8)	425 (4.3)	63 (0.9)	409 (3.2)	10.0 (0.04)
Cote d'Ivoire		18 (1.2)	257 (18.9)	51 (0.9)	177 (6.7)	31 (1.0)	154 (5.9)	10.8 (0.06)
Cyprus	r	15 (0.7)	536 (4.8)	29 (0.9)	485 (4.3)	56 (1.0)	450 (3.4)	10.1 (0.05)
Czech Republic		9 (0.5)	585 (4.4)	35 (1.0)	546 (2.6)	55 (1.2)	511 (2.1)	9.6 (0.05)
Finland	r	8 (0.5)	631 (5.5)	29 (0.9)	572 (4.4)	62 (1.2)	520 (3.1)	9.5 (0.05)
France		15 (0.9)	546 (4.0)	37 (1.0)	510 (3.3)	49 (1.4)	466 (3.7)	10.1 (0.06)
Georgia	r	15 (1.0)	506 (5.2)	32 (0.9)	461 (4.2)	54 (1.3)	438 (3.2)	10.1 (0.07)
Hungary		14 (0.8)	574 (3.8)	34 (1.0)	531 (3.9)	52 (1.3)	504 (3.5)	10.0 (0.06)
Kazakhstan		11 (0.6)	501 (5.7)	41 (1.0)	453 (3.4)	48 (1.1)	438 (3.3)	10.2 (0.04)
Lithuania		8 (0.5)	601 (5.0)	28 (0.8)	539 (3.6)	64 (1.0)	506 (3.2)	9.6 (0.04)
Malta	r	16 (0.6)	589 (4.7)	33 (1.0)	535 (3.0)	51 (1.0)	477 (2.4)	10.1 (0.04)
Morocco	r	12 (0.7)	381 (5.6)	42 (0.8)	332 (3.6)	46 (1.1)	312 (3.8)	10.4 (0.04)
Portugal		13 (0.7)	578 (3.8)	32 (0.8)	526 (2.7)	54 (1.1)	480 (2.4)	10.0 (0.05)
Romania	r	7 (0.6)	546 (6.5)	27 (1.2)	485 (4.7)	66 (1.3)	464 (4.1)	9.7 (0.06)
Sweden	r	10 (0.8)	615 (5.7)	38 (1.2)	554 (4.1)	51 (1.2)	505 (3.1)	10.0 (0.05)
Uzbekistan		16 (1.0)	431 (6.6)	39 (0.8)	403 (4.1)	46 (1.2)	389 (3.4)	10.6 (0.06)
International Average		12 (0.2)	525 (1.6)	35 (0.2)	474 (1.0)	53 (0.3)	442 (0.8)	

Exhibit 6.3.6e: Students Confident in Earth Science

Earth Science		Very Confident in Earth Science		Somewhat Confident in Earth Science		Not Confident in Earth Science		Average Scale Score
Country		Percent of Students	Average Achievement	Percent of Students	Average Achievement	Percent of Students	Average Achievement	
Austria		21 (0.8)	546 (3.2)	45 (0.9)	517 (3.1)	34 (1.2)	494 (3.5)	10.2 (0.05)
Azerbaijan	r	11 (0.7)	468 (5.3)	34 (0.9)	423 (4.0)	54 (1.1)	408 (3.2)	9.7 (0.04)
Cote d'Ivoire		18 (1.2)	256 (17.2)	53 (0.8)	177 (6.5)	29 (0.9)	150 (6.9)	10.3 (0.05)
Cyprus	r	22 (0.8)	513 (4.5)	35 (0.9)	478 (3.8)	43 (1.1)	436 (3.4)	10.1 (0.05)
Czech Republic		21 (0.7)	554 (3.2)	45 (0.9)	530 (2.4)	34 (1.1)	515 (2.7)	10.1 (0.05)
Finland	r	13 (0.6)	598 (4.3)	45 (0.8)	557 (2.9)	42 (1.0)	507 (3.6)	9.8 (0.04)
France		14 (0.9)	523 (4.9)	43 (1.3)	506 (3.4)	43 (1.6)	472 (3.8)	9.7 (0.07)
Georgia		22 (1.2)	488 (4.7)	39 (1.2)	457 (4.3)	39 (1.1)	435 (3.2)	10.3 (0.07)
Hungary		22 (0.7)	557 (3.9)	41 (0.8)	527 (3.1)	36 (1.1)	498 (4.1)	10.2 (0.05)
Kazakhstan		14 (0.8)	496 (5.5)	48 (0.8)	452 (3.3)	37 (1.0)	430 (3.3)	10.0 (0.05)
Lithuania		15 (0.7)	566 (4.1)	42 (0.9)	527 (3.4)	42 (1.1)	502 (3.6)	10.0 (0.04)
Morocco	r	11 (0.6)	376 (6.0)	41 (0.9)	328 (3.7)	48 (1.1)	318 (3.6)	9.7 (0.03)
Portugal		17 (0.8)	560 (3.9)	45 (0.9)	516 (2.6)	37 (1.1)	474 (2.6)	10.1 (0.04)
Uzbekistan	r	17 (1.2)	427 (6.5)	40 (0.9)	400 (3.9)	43 (1.2)	388 (4.0)	10.2 (0.07)
International Average		17 (0.2)	495 (1.7)	43 (0.3)	457 (1.0)	40 (0.3)	431 (1.0)	
Malta	x	16 (0.8)	577 (6.0)	39 (1.2)	522 (3.8)	45 (1.1)	467 (3.7)	9.9 (0.04)
Romania	y	--	--	--	--	--	--	--
Sweden		--	--	--	--	--	--	--

This TIMSS context questionnaire scale was established in 2011 based on the combined response distribution of countries that participated in TIMSS 2011. To provide a point of reference for country comparisons, the scale centerpoint of 10 was located at the mean of the combined distribution. The units of the scale were chosen so that 2 scale score points corresponded to the standard deviation of the distribution. The separate scales for biology, chemistry, physics, and earth science were each established in 2011 using a comparable approach.

(.) Standard errors appear in parentheses. Because of rounding some results may appear inconsistent.

An "r" indicates data are available for at least 70% but less than 85% of the students. An "s" indicates data are available for at least 50% but less than 70% of the students.

An "x" indicates data are available for at least 40% but less than 50% of the students—interpret with caution. A "y" indicates data are available for less than 40% of the students.

A dash (-) indicates comparable data not available.

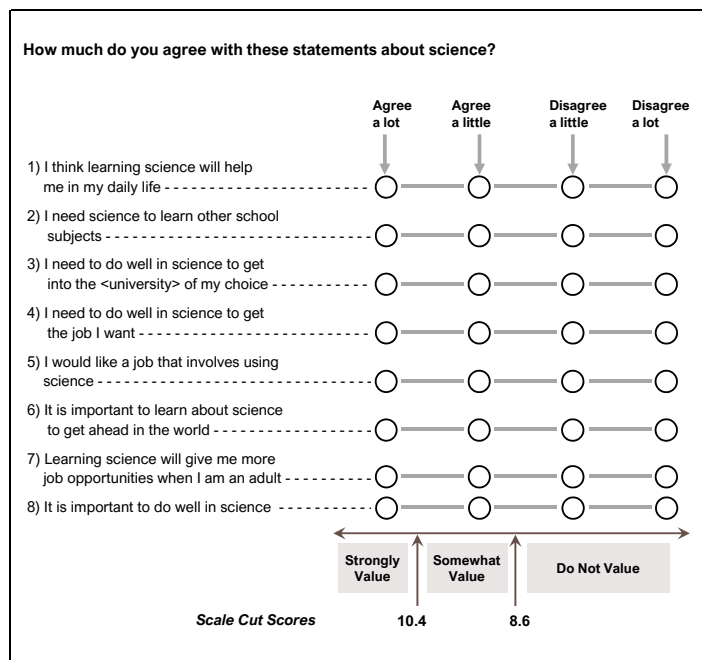
Students Value Science

Eighth-grade students who value science have higher average science achievement than those who do not value science. The items in the TIMSS 2023 *Students Value Science* scale (Exhibit 6.3.7) asked students to indicate their level of agreement with eight statements about the value of science in their lives. Students were grouped into three categories based on their responses: “strongly value,” “somewhat value,” and “do not value” science.

On average across countries, 36 percent of students reported that they “strongly value” science, 36 percent reported that they “somewhat value” science, and 27 percent reported that they “do not value” science (Exhibit 6.3.8). There was a positive relationship between students’ self-reports of valuing science and average achievement, with students who reported that they “strongly value” science having an average achievement score 32 points higher than students who reported that they “do not value” science (492 vs. 460). Average achievement for students who reported that they “somewhat value” science was in between (475).

About the Scale

Students were scored according to their responses to eight statements on the *Students Value Science* scale. Cut scores divide the scale into three categories. Students who **Strongly Value Science** had a score at or above the cut score corresponding to “agreeing a lot” with four of the eight statements and “agreeing a little” with the other four, on average. Students who **Do Not Value Science** had a score at or below the cut score corresponding to “disagreeing a little” with four of the eight statements and “agreeing a little” with the other four, on average. All other students **Somewhat Value Science**.



SOURCE: IEA's Trends in International science and Science Study - TIMSS 2023
Downloaded from <https://timss2023.org/results>

Exhibit 6.3.8: Students Value Science

Country	Strongly Value Science		Somewhat Value Science		Do Not Value Science		Average Scale Score
	Percent of Students	Average Achievement	Percent of Students	Average Achievement	Percent of Students	Average Achievement	
Australia	24 (0.7)	557 (4.1)	39 (0.7)	531 (4.0)	37 (0.8)	502 (3.4)	9.2 (0.04)
Austria	15 (0.7)	538 (4.9)	37 (0.8)	514 (2.9)	48 (1.0)	509 (3.0)	8.8 (0.03)
Azerbaijan	47 (1.3)	421 (3.2)	33 (1.0)	418 (3.8)	21 (0.9)	417 (4.6)	10.1 (0.05)
Bahrain	53 (1.2)	475 (3.0)	30 (1.0)	453 (3.1)	18 (0.7)	430 (5.1)	10.3 (0.05)
Brazil	42 (0.8)	418 (2.3)	38 (0.8)	433 (3.3)	21 (0.8)	439 (4.7)	10.0 (0.03)
Chile	28 (1.0)	460 (3.5)	43 (0.8)	459 (2.8)	29 (1.1)	462 (3.8)	9.5 (0.04)
Chinese Taipei	21 (0.8)	609 (4.3)	37 (0.7)	584 (3.0)	42 (1.1)	547 (2.7)	9.0 (0.04)
Cote d'Ivoire	58 (1.2)	185 (8.3)	34 (1.0)	179 (7.2)	7 (0.4)	189 (17.6)	10.6 (0.04)
Cyprus	31 (0.8)	495 (4.4)	35 (0.9)	474 (3.8)	34 (0.8)	451 (3.2)	9.4 (0.04)
Czech Republic	14 (0.6)	544 (4.1)	39 (0.7)	532 (2.3)	47 (0.9)	521 (2.2)	8.8 (0.03)
England	28 (0.8)	564 (5.7)	41 (1.0)	543 (4.8)	31 (1.0)	512 (4.8)	9.4 (0.04)
Finland	16 (0.6)	573 (5.4)	40 (0.8)	550 (3.3)	44 (1.0)	517 (3.0)	8.9 (0.03)
France	20 (0.8)	509 (4.5)	40 (1.0)	500 (3.4)	41 (1.0)	477 (3.8)	9.0 (0.04)
Georgia	51 (1.1)	455 (3.3)	34 (0.9)	450 (4.2)	16 (0.8)	446 (4.1)	10.4 (0.04)
Hong Kong SAR	30 (1.0)	560 (5.2)	44 (0.8)	527 (5.8)	26 (1.1)	501 (5.2)	9.6 (0.05)
Hungary	23 (0.7)	541 (4.8)	40 (0.8)	519 (3.7)	38 (0.9)	517 (3.0)	9.2 (0.04)
Iran, Islamic Rep. of	51 (1.0)	427 (4.4)	32 (0.8)	408 (4.3)	18 (0.7)	417 (3.5)	10.3 (0.04)
Ireland	23 (1.2)	560 (4.7)	38 (0.8)	542 (4.2)	40 (1.6)	514 (4.2)	9.1 (0.06)
Israel	28 (0.9)	500 (5.4)	33 (0.8)	486 (3.9)	40 (1.0)	476 (3.9)	9.2 (0.05)
Italy	20 (0.8)	519 (3.8)	37 (0.8)	506 (3.3)	44 (1.1)	494 (3.4)	9.0 (0.04)
Japan	13 (0.7)	582 (6.5)	45 (1.0)	573 (3.6)	42 (1.2)	536 (2.8)	8.9 (0.03)
Jordan	59 (1.0)	428 (4.0)	28 (0.8)	410 (4.0)	14 (0.6)	402 (5.5)	10.6 (0.04)
Kazakhstan	35 (1.1)	459 (4.1)	44 (0.9)	441 (3.1)	21 (0.7)	436 (3.9)	9.9 (0.04)
Korea, Rep. of	28 (0.8)	582 (3.3)	41 (0.8)	549 (3.1)	31 (0.8)	509 (2.6)	9.4 (0.03)
Kuwait	54 (1.2)	438 (6.3)	31 (0.8)	420 (6.0)	15 (0.8)	404 (6.7)	10.4 (0.05)
Lithuania	28 (0.8)	533 (4.0)	44 (1.0)	518 (3.5)	29 (0.9)	518 (3.5)	9.5 (0.03)
Malaysia	45 (1.0)	454 (3.7)	42 (0.8)	415 (3.7)	12 (0.5)	374 (5.3)	10.3 (0.03)
Malta	35 (0.7)	552 (3.1)	32 (0.8)	504 (3.1)	33 (0.8)	472 (2.7)	9.5 (0.03)
Morocco	52 (0.8)	337 (3.7)	32 (0.7)	319 (3.5)	15 (0.6)	317 (4.6)	10.4 (0.03)
Norway (9)	15 (0.5)	516 (4.7)	40 (0.8)	506 (2.8)	45 (0.8)	483 (3.3)	8.8 (0.03)
Oman	57 (0.9)	480 (2.6)	30 (0.7)	448 (3.6)	13 (0.6)	424 (5.0)	10.5 (0.03)
Palestinian Nat'l Auth.	54 (0.9)	416 (2.9)	28 (0.7)	393 (3.9)	17 (0.7)	373 (4.8)	10.4 (0.04)
Portugal	27 (0.8)	524 (3.0)	38 (0.9)	507 (3.4)	35 (1.0)	496 (2.5)	9.4 (0.03)
Qatar	52 (1.6)	501 (5.4)	31 (1.2)	484 (5.2)	17 (0.9)	453 (5.8)	10.3 (0.06)
Romania	33 (1.2)	476 (5.0)	35 (1.1)	473 (4.5)	32 (1.2)	472 (4.5)	9.5 (0.05)
Saudi Arabia	56 (1.0)	436 (3.8)	30 (0.7)	426 (4.4)	14 (0.7)	417 (4.9)	10.5 (0.04)
Singapore	45 (1.0)	636 (4.8)	41 (0.8)	594 (6.0)	14 (0.6)	549 (8.0)	10.2 (0.04)
South Africa (9)	52 (0.8)	364 (4.3)	32 (0.6)	346 (4.4)	16 (0.6)	387 (5.7)	10.3 (0.03)
Sweden	18 (0.9)	551 (5.0)	36 (1.0)	542 (4.1)	46 (1.0)	515 (3.2)	8.9 (0.04)
Türkiye	39 (1.0)	540 (4.3)	37 (0.9)	527 (4.0)	24 (0.7)	523 (5.2)	9.8 (0.04)
United Arab Emirates	57 (0.6)	509 (2.3)	29 (0.4)	489 (2.2)	14 (0.4)	459 (3.1)	10.6 (0.02)
United States	29 (0.9)	536 (4.7)	42 (0.7)	519 (3.9)	29 (0.7)	501 (4.0)	9.5 (0.03)
Uzbekistan	66 (1.2)	398 (3.9)	25 (0.9)	398 (4.9)	8 (0.6)	405 (5.0)	11.0 (0.04)
International Average	36 (0.1)	492 (0.7)	36 (0.1)	475 (0.6)	27 (0.1)	460 (0.8)	
Benchmarking Participants							
Abu Dhabi, UAE	52 (0.9)	476 (4.5)	31 (0.6)	453 (3.8)	17 (0.7)	412 (4.8)	10.3 (0.04)
Dubai, UAE	53 (1.0)	568 (3.1)	31 (0.8)	540 (3.7)	15 (0.6)	523 (4.5)	10.4 (0.04)
Sharjah, UAE	65 (1.4)	511 (5.6)	25 (0.9)	499 (5.8)	10 (0.7)	467 (6.6)	10.9 (0.06)

This TIMSS context questionnaire scale was established in 2011 based on the combined response distribution of countries that participated in TIMSS 2011. To provide a point of reference for country comparisons, the scale centerpoint of 10 was located at the mean of the combined distribution. The units of the scale were chosen so that 2 scale score points corresponded to the standard deviation of the distribution.

() Standard errors appear in parentheses. Because of rounding some results may appear inconsistent.

An "r" indicates data are available for at least 70% but less than 85% of the students.

SOURCE: IEA's Trends in International Science and Science Study - TIMSS 2023
Downloaded from <https://timss2023.org/results>



IEA TIMSS & PIRLS
BOSTON COLLEGE

Students' Use of Technology

Students' Digital Self-Efficacy

Digital self-efficacy has a positive relationship with mathematics and science achievement for fourth- and eighth-grade students. Internationally, a majority of students in both grades reported at least some confidence in their ability to use digital devices. The TIMSS 2023 *Digital Self-Efficacy* scale (Exhibit 6.4.1) is based on students' agreement with statements about confidence in using digital devices in different ways, such as writing text or creating presentations. Based on their responses, students were classified as having "high," "medium," or "low" digital self-efficacy.

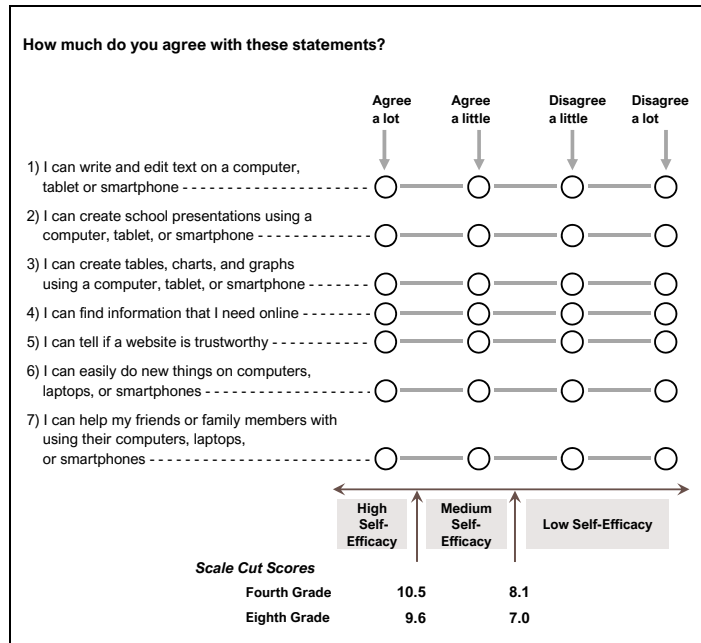
Internationally, about half of fourth-grade students (49%) were classified as having "medium" digital self-efficacy and an additional 36 percent were classified as having "high" digital self-efficacy. The remaining 15 percent of students were classified as having "low" digital self-efficacy. In both subjects, fourth-grade students with greater digital self-efficacy had higher average mathematics and science achievement. Students classified as having "high" digital self-efficacy had an average achievement of 518 in mathematics and 512 in science and fourth-grade students classified as having "low" digital self-efficacy had an average achievement of 477 in mathematics and 468 in science, internationally. Average achievement for fourth graders with "medium" digital self-efficacy was in between (503 in mathematics and 493 in science).

On average, over half of eighth-grade students (56%) were classified as having "high" digital self-efficacy and an additional 37 percent were classified as having "medium" digital self-efficacy. Only 6 percent of eighth-grade students were classified as having "low" digital self-efficacy. Eighth-grade students classified as having greater digital self-efficacy had higher average achievement in both subjects. Students with "high" digital self-efficacy had an average achievement of 492 in mathematics, those with "medium" digital self-efficacy had an average achievement of 459, and the small percentage of students with "low" digital self-efficacy had an average achievement of 408. In science, students with "high" digital self-efficacy had an average achievement of 493, those with "medium" digital self-efficacy had an average achievement of 456, and the even smaller percentage of students with "low" digital self-efficacy had an average achievement of 396.

Exhibit 6.4.1: Students' Digital Self-Efficacy

About the Scale

Students were scored according to their responses to seven statements on the *Digital Self-Efficacy* scale. Cut scores divide the scale into three categories. Students with **High Digital Self-Efficacy** had a score at or above the cut score corresponding to "agreeing a lot" with four of the seven statements and "agreeing a little" with the other three, on average. Students with **Low Digital Self-Efficacy** had a score at or below the cut score corresponding to "disagreeing a little" with four of the seven statements and "agreeing a little" with the other three, on average. All other students had **Medium Digital Self-Efficacy**.



SOURCE: IEA's Trends in International Mathematics and Science Study - TIMSS 2023
Downloaded from <https://timss2023.org/results>

Exhibit 6.4.2: Students' Digital Self-Efficacy

Country	High Digital Self-Efficacy		Medium Digital Self-Efficacy		Low Digital Self-Efficacy		Average Scale Score
	Percent of Students	Average Achievement	Percent of Students	Average Achievement	Percent of Students	Average Achievement	
Albania	34 (1.7)	520 (6.6)	52 (1.9)	513 (5.3)	14 (1.4)	509 (9.2)	9.9 (0.06)
Armenia	22 (0.9)	507 (4.6)	49 (1.0)	521 (2.6)	29 (1.0)	520 (3.8)	9.1 (0.05)
Australia	46 (1.1)	551 (2.8)	45 (0.9)	516 (3.2)	9 (0.6)	466 (6.8)	10.4 (0.05)
Azerbaijan	23 (0.9)	522 (4.4)	53 (1.0)	503 (3.4)	23 (1.0)	480 (4.4)	9.3 (0.05)
Bahrain	41 (1.1)	478 (5.0)	47 (1.0)	460 (4.1)	12 (0.8)	434 (7.4)	10.2 (0.05)
Belgium (Flemish)	36 (1.1)	529 (2.7)	54 (0.9)	521 (2.4)	11 (0.8)	510 (5.6)	10.0 (0.05)
Belgium (French)	24 (0.8)	501 (3.3)	55 (0.8)	489 (2.6)	21 (0.7)	484 (3.6)	9.4 (0.03)
Bosnia & Herzegovina	34 (1.1)	453 (3.9)	57 (1.2)	456 (3.6)	9 (0.7)	421 (6.3)	10.0 (0.03)
Brazil	29 (0.9)	427 (5.7)	50 (0.9)	410 (3.5)	22 (0.8)	389 (3.7)	9.4 (0.04)
Bulgaria	39 (1.4)	558 (3.5)	45 (1.3)	529 (4.1)	16 (1.4)	468 (12.4)	9.9 (0.08)
Canada	46 (0.8)	522 (2.1)	45 (0.6)	498 (2.3)	8 (0.4)	465 (4.3)	10.4 (0.03)
Chile	43 (1.0)	455 (2.8)	44 (1.0)	446 (3.4)	13 (0.6)	415 (4.7)	10.3 (0.04)
Chinese Taipei	58 (0.9)	611 (1.7)	36 (0.9)	604 (2.6)	6 (0.4)	596 (5.5)	11.1 (0.04)
Cyprus	33 (1.1)	529 (2.6)	50 (0.9)	516 (2.8)	17 (0.8)	496 (4.7)	9.8 (0.05)
Czech Republic	25 (0.8)	536 (3.3)	59 (0.7)	534 (2.2)	16 (0.6)	518 (3.6)	9.5 (0.03)
Denmark	43 (1.1)	539 (2.7)	50 (1.0)	519 (2.3)	7 (0.5)	481 (4.4)	10.2 (0.04)
England	50 (1.1)	574 (3.2)	44 (1.0)	540 (3.1)	7 (0.5)	501 (7.0)	10.5 (0.04)
Finland	53 (0.9)	536 (2.6)	42 (0.9)	528 (2.7)	4 (0.4)	484 (7.4)	10.8 (0.03)
France	23 (0.8)	489 (3.3)	57 (0.9)	487 (3.6)	20 (0.9)	480 (4.4)	9.4 (0.04)
Georgia	38 (1.3)	511 (3.3)	53 (1.2)	502 (3.4)	9 (0.6)	477 (7.4)	10.1 (0.05)
Germany	31 (1.0)	533 (3.0)	49 (0.8)	526 (2.3)	20 (0.8)	515 (4.1)	9.6 (0.04)
Hong Kong SAR	53 (1.1)	604 (4.5)	40 (1.0)	592 (4.5)	8 (0.4)	561 (6.8)	10.8 (0.06)
Hungary	27 (0.9)	539 (4.4)	54 (1.1)	524 (3.5)	19 (1.2)	497 (7.4)	9.5 (0.06)
Iran, Islamic Rep. of	30 (1.1)	432 (5.0)	51 (1.0)	425 (4.0)	19 (1.1)	399 (7.5)	9.6 (0.06)
Ireland	40 (1.1)	559 (3.2)	51 (1.3)	540 (3.5)	9 (0.8)	525 (6.4)	10.2 (0.04)
Italy	24 (0.9)	521 (3.7)	54 (0.8)	518 (3.3)	23 (0.9)	499 (4.0)	9.4 (0.04)
Japan	21 (1.0)	603 (3.5)	52 (1.0)	596 (2.6)	27 (1.1)	573 (2.9)	9.2 (0.05)
Jordan	22 (1.3)	441 (4.4)	38 (1.7)	425 (5.5)	39 (2.3)	427 (9.2)	8.7 (0.11)
Kazakhstan	24 (1.0)	514 (5.7)	58 (0.8)	489 (3.1)	18 (0.8)	464 (4.8)	9.5 (0.04)
Korea, Rep. of	30 (1.1)	613 (3.2)	49 (1.0)	594 (2.8)	21 (0.9)	570 (4.2)	9.6 (0.05)
Kosovo	31 (1.0)	468 (4.6)	53 (1.0)	454 (3.5)	17 (0.7)	430 (4.5)	9.7 (0.04)
Kuwait	29 (1.1)	394 (5.9)	55 (1.0)	386 (4.7)	15 (0.8)	377 (7.1)	9.7 (0.05)
Latvia	43 (1.1)	549 (3.5)	51 (1.0)	530 (3.2)	7 (0.5)	486 (7.1)	10.3 (0.04)
Lithuania	47 (1.1)	575 (3.3)	46 (1.0)	556 (2.9)	7 (0.5)	517 (5.6)	10.5 (0.04)
Macao SAR	36 (0.5)	593 (1.9)	51 (0.5)	578 (1.5)	14 (0.4)	567 (3.1)	10.0 (0.02)
Montenegro	33 (0.8)	485 (2.8)	51 (0.8)	478 (2.2)	16 (0.6)	479 (4.1)	9.8 (0.04)
Morocco	9 (0.9)	407 (8.0)	38 (1.6)	396 (4.9)	53 (1.9)	391 (6.9)	7.7 (0.10)
Netherlands	43 (1.2)	545 (2.8)	50 (1.0)	536 (2.3)	7 (0.7)	512 (6.6)	10.3 (0.04)
New Zealand	40 (1.1)	516 (3.3)	48 (0.9)	488 (2.9)	12 (0.7)	447 (5.4)	10.1 (0.05)
North Macedonia	35 (1.1)	485 (4.3)	50 (1.0)	483 (3.6)	16 (0.9)	463 (6.5)	9.9 (0.05)
Norway (5)	52 (1.1)	540 (2.6)	43 (1.0)	526 (2.0)	4 (0.4)	487 (5.8)	10.7 (0.04)
Oman	29 (0.7)	435 (5.0)	53 (0.7)	423 (3.9)	18 (0.7)	406 (6.2)	9.6 (0.03)
Poland	45 (0.9)	556 (2.4)	50 (1.0)	543 (2.6)	5 (0.4)	501 (6.3)	10.4 (0.03)
Portugal	43 (1.2)	533 (3.0)	48 (1.1)	511 (3.2)	9 (0.5)	480 (5.1)	10.2 (0.05)
Qatar	37 (1.0)	491 (3.9)	49 (0.9)	460 (3.5)	14 (0.6)	430 (5.0)	10.0 (0.04)
Romania	53 (1.7)	560 (4.7)	38 (1.4)	540 (5.3)	9 (1.0)	505 (9.7)	10.6 (0.07)
Saudi Arabia	37 (1.0)	441 (4.7)	48 (0.9)	421 (4.4)	15 (0.7)	400 (6.2)	10.0 (0.05)
Serbia	41 (1.3)	536 (3.8)	50 (1.2)	519 (3.6)	9 (0.8)	513 (8.7)	10.2 (0.06)
Singapore	49 (0.7)	635 (2.7)	43 (0.7)	602 (3.4)	8 (0.4)	567 (5.5)	10.6 (0.03)
Slovak Republic	32 (1.5)	534 (3.4)	52 (1.2)	520 (3.1)	16 (1.4)	470 (9.5)	9.7 (0.08)
Slovenia	34 (0.9)	515 (2.6)	52 (0.8)	516 (2.2)	14 (0.6)	513 (3.7)	9.9 (0.04)
South Africa (5)	19 (0.8)	419 (7.0)	51 (1.3)	361 (3.7)	30 (1.6)	328 (4.5)	8.9 (0.07)
Spain	38 (0.8)	510 (2.2)	51 (0.7)	497 (2.5)	12 (0.5)	476 (3.3)	10.0 (0.03)
Sweden	47 (1.3)	543 (2.9)	48 (1.3)	523 (3.2)	5 (0.4)	499 (7.1)	10.4 (0.04)
Türkiye (5)	57 (1.3)	576 (3.8)	38 (1.1)	533 (4.8)	5 (0.4)	462 (8.3)	10.8 (0.05)
United Arab Emirates	42 (0.5)	526 (1.6)	48 (0.4)	491 (1.4)	11 (0.3)	452 (3.1)	10.2 (0.02)
United States	38 (0.9)	543 (3.5)	51 (0.8)	515 (3.1)	11 (0.5)	466 (5.3)	10.1 (0.04)
Uzbekistan	20 (1.0)	446 (5.2)	55 (1.2)	451 (3.4)	25 (1.1)	439 (4.1)	9.2 (0.05)
International Average	36 (0.1)	518 (0.5)	49 (0.1)	503 (0.4)	15 (0.1)	477 (0.8)	
Benchmarking Participants							
Ontario, Canada	50 (1.3)	523 (3.3)	44 (1.2)	494 (4.1)	7 (0.6)	451 (8.9)	10.6 (0.04)
Quebec, Canada	40 (1.1)	525 (3.0)	49 (0.8)	514 (3.0)	11 (0.7)	493 (6.2)	10.2 (0.04)
Abu Dhabi, UAE	35 (0.9)	493 (2.9)	51 (0.6)	455 (2.1)	14 (0.6)	418 (4.2)	9.9 (0.04)
Dubai, UAE	50 (0.8)	574 (1.9)	44 (0.8)	547 (2.4)	6 (0.3)	510 (5.1)	10.6 (0.03)
Sharjah, UAE	41 (0.9)	523 (3.4)	48 (0.9)	498 (3.4)	11 (0.6)	474 (8.3)	10.2 (0.04)

This TIMSS context questionnaire scale was established in 2023 based on the combined response distribution of countries that participated in TIMSS 2023. To provide a point of reference for country comparisons, the scale centerpoint of 10 was located at the mean of the combined distribution. The units of the scale were chosen so that 2 scale score points corresponded to the standard deviation of the distribution.

() Standard errors appear in parentheses. Because of rounding some results may appear inconsistent.

An "r" indicates data are available for at least 70% but less than 85% of the students.

SOURCE: IEA's Trends in International Mathematics and Science Study - TIMSS 2023
Downloaded from <https://timss2023.org/results>



TIMSS & PIRLS
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Exhibit 6.4.3: Students' Digital Self-Efficacy

Country	High Digital Self-Efficacy		Medium Digital Self-Efficacy		Low Digital Self-Efficacy		Average Scale Score
	Percent of Students	Average Achievement	Percent of Students	Average Achievement	Percent of Students	Average Achievement	
Albania	34 (1.7)	502 (6.2)	52 (1.9)	494 (4.9)	14 (1.4)	484 (9.7)	9.9 (0.06)
Armenia	22 (0.9)	457 (4.0)	49 (1.0)	464 (2.6)	29 (1.0)	462 (3.6)	9.1 (0.05)
Australia	46 (1.1)	572 (2.8)	45 (0.9)	543 (2.8)	9 (0.6)	497 (7.1)	10.4 (0.05)
Azerbaijan	23 (0.9)	445 (4.0)	53 (1.0)	427 (3.2)	23 (1.0)	413 (4.5)	9.3 (0.05)
Bahrain	41 (1.1)	495 (5.1)	47 (1.0)	471 (3.9)	12 (0.8)	449 (7.4)	10.2 (0.05)
Belgium (Flemish)	36 (1.1)	500 (2.6)	54 (0.9)	487 (2.6)	11 (0.8)	473 (6.0)	10.0 (0.05)
Belgium (French)	24 (0.8)	495 (3.3)	55 (0.8)	479 (2.7)	21 (0.7)	476 (4.5)	9.4 (0.03)
Bosnia & Herzegovina	34 (1.1)	457 (4.3)	57 (1.2)	457 (4.1)	9 (0.7)	420 (6.2)	10.0 (0.03)
Brazil	29 (0.9)	460 (5.3)	50 (0.9)	436 (3.7)	22 (0.8)	412 (4.0)	9.4 (0.04)
Bulgaria	39 (1.4)	562 (3.8)	45 (1.3)	530 (5.0)	16 (1.4)	455 (17.5)	9.9 (0.08)
Canada	46 (0.8)	541 (2.1)	45 (0.6)	513 (2.2)	8 (0.4)	481 (4.1)	10.4 (0.03)
Chile	43 (1.0)	493 (3.0)	44 (1.0)	480 (3.3)	13 (0.6)	449 (4.2)	10.3 (0.04)
Chinese Taipei	58 (0.9)	578 (1.8)	36 (0.9)	568 (2.8)	6 (0.4)	557 (6.3)	11.1 (0.04)
Cyprus	33 (1.1)	504 (3.7)	50 (0.9)	486 (3.4)	17 (0.8)	461 (5.3)	9.8 (0.05)
Czech Republic	25 (0.8)	533 (3.1)	59 (0.7)	527 (2.4)	16 (0.6)	516 (3.4)	9.5 (0.03)
Denmark	43 (1.1)	537 (2.8)	50 (1.0)	517 (2.9)	7 (0.5)	488 (5.7)	10.2 (0.04)
England	50 (1.1)	574 (3.1)	44 (1.0)	547 (3.0)	7 (0.5)	515 (8.2)	10.5 (0.04)
Finland	53 (0.9)	549 (3.0)	42 (0.9)	541 (3.2)	4 (0.4)	507 (7.3)	10.8 (0.03)
France	23 (0.8)	498 (3.3)	57 (0.9)	489 (3.6)	20 (0.9)	484 (5.4)	9.4 (0.04)
Georgia	38 (1.3)	481 (3.8)	53 (1.2)	467 (3.7)	9 (0.6)	442 (6.7)	10.1 (0.05)
Germany	31 (1.0)	527 (4.3)	49 (0.8)	517 (2.8)	20 (0.8)	506 (4.4)	9.6 (0.04)
Hong Kong SAR	53 (1.1)	558 (4.3)	40 (1.0)	541 (4.4)	8 (0.4)	501 (7.3)	10.8 (0.06)
Hungary	27 (0.9)	540 (3.8)	54 (1.1)	528 (3.1)	19 (1.2)	502 (7.5)	9.5 (0.06)
Iran, Islamic Rep. of	30 (1.1)	447 (6.0)	51 (1.0)	438 (4.1)	19 (1.1)	407 (7.7)	9.6 (0.06)
Ireland	40 (1.1)	547 (3.6)	51 (1.3)	526 (3.7)	9 (0.8)	506 (6.8)	10.2 (0.04)
Italy	24 (0.9)	519 (3.6)	54 (0.8)	514 (2.6)	23 (0.9)	497 (3.4)	9.4 (0.04)
Japan	21 (1.0)	571 (3.7)	52 (1.0)	559 (3.0)	27 (1.1)	537 (3.0)	9.2 (0.05)
Jordan	22 (1.3)	439 (5.5)	38 (1.7)	416 (4.7)	39 (2.3)	414 (8.8)	8.7 (0.11)
Kazakhstan	24 (1.0)	505 (5.3)	58 (0.8)	465 (3.2)	18 (0.8)	437 (4.4)	9.5 (0.04)
Korea, Rep. of	30 (1.1)	602 (3.0)	49 (1.0)	583 (2.8)	21 (0.9)	557 (4.0)	9.6 (0.05)
Kosovo	31 (1.0)	418 (4.5)	53 (1.0)	404 (4.2)	17 (0.7)	388 (4.3)	9.7 (0.04)
Kuwait	29 (1.1)	381 (6.7)	55 (1.0)	381 (5.6)	15 (0.8)	375 (8.2)	9.7 (0.05)
Latvia	43 (1.1)	541 (3.8)	51 (1.0)	520 (3.3)	7 (0.5)	486 (7.2)	10.3 (0.04)
Lithuania	47 (1.1)	551 (3.3)	46 (1.0)	531 (2.8)	7 (0.5)	496 (6.1)	10.5 (0.04)
Macao SAR	36 (0.5)	552 (2.4)	51 (0.5)	530 (1.5)	14 (0.4)	518 (3.4)	10.0 (0.02)
Montenegro	33 (0.8)	473 (2.6)	51 (0.8)	462 (2.6)	16 (0.6)	459 (3.2)	9.8 (0.04)
Morocco	9 (0.9)	407 (9.7)	38 (1.6)	393 (5.7)	53 (1.9)	388 (7.6)	7.7 (0.10)
Netherlands	43 (1.2)	525 (3.6)	50 (1.0)	516 (3.4)	7 (0.7)	489 (7.1)	10.3 (0.04)
New Zealand	40 (1.1)	540 (3.2)	48 (0.9)	516 (2.9)	12 (0.7)	477 (6.5)	10.1 (0.05)
North Macedonia	35 (1.1)	456 (4.2)	50 (1.0)	449 (3.8)	16 (0.9)	428 (6.5)	9.9 (0.05)
Norway (5)	52 (1.1)	542 (3.1)	43 (1.0)	525 (2.4)	4 (0.4)	487 (8.4)	10.7 (0.04)
Oman	29 (0.7)	450 (5.2)	53 (0.7)	436 (4.0)	18 (0.7)	411 (6.5)	9.6 (0.03)
Poland	45 (0.9)	558 (2.5)	50 (1.0)	547 (2.8)	5 (0.4)	519 (7.7)	10.4 (0.03)
Portugal	43 (1.2)	526 (2.9)	48 (1.1)	504 (2.5)	9 (0.5)	477 (4.4)	10.2 (0.05)
Qatar	37 (1.0)	503 (3.9)	49 (0.9)	468 (3.7)	14 (0.6)	433 (5.3)	10.0 (0.04)
Romania	53 (1.7)	548 (4.6)	38 (1.4)	522 (5.0)	9 (1.0)	486 (9.2)	10.6 (0.07)
Saudi Arabia	37 (1.0)	456 (4.5)	48 (0.9)	429 (4.0)	15 (0.7)	404 (6.7)	10.0 (0.05)
Serbia	41 (1.3)	524 (4.0)	50 (1.2)	505 (3.2)	9 (0.8)	500 (8.0)	10.2 (0.06)
Singapore	49 (0.7)	629 (2.4)	43 (0.7)	593 (3.1)	8 (0.4)	560 (5.9)	10.6 (0.03)
Slovak Republic	32 (1.5)	542 (3.4)	52 (1.2)	528 (3.1)	16 (1.4)	465 (11.9)	9.7 (0.08)
Slovenia	34 (0.9)	529 (3.0)	52 (0.8)	527 (2.8)	14 (0.6)	525 (4.3)	9.9 (0.04)
South Africa (5)	19 (0.8)	386 (9.5)	51 (1.3)	305 (4.9)	30 (1.6)	260 (5.9)	8.9 (0.07)
Spain	38 (0.8)	516 (2.3)	51 (0.7)	502 (2.2)	12 (0.5)	484 (3.8)	10.0 (0.03)
Sweden	47 (1.3)	548 (3.2)	48 (1.3)	525 (3.7)	5 (0.4)	492 (7.8)	10.4 (0.04)
Türkiye (5)	57 (1.3)	588 (3.2)	38 (1.1)	554 (4.0)	5 (0.4)	496 (8.6)	10.8 (0.05)
United Arab Emirates	42 (0.5)	530 (2.1)	48 (0.4)	486 (2.1)	11 (0.3)	440 (3.3)	10.2 (0.02)
United States	38 (0.9)	560 (3.3)	51 (0.8)	530 (2.8)	11 (0.5)	485 (5.1)	10.1 (0.04)
Uzbekistan	20 (1.0)	415 (5.2)	55 (1.2)	418 (3.8)	25 (1.1)	410 (4.6)	9.2 (0.05)
International Average	36 (0.1)	512 (0.5)	49 (0.1)	493 (0.5)	15 (0.1)	468 (0.9)	
Benchmarking Participants							
Ontario, Canada	50 (1.3)	546 (3.2)	44 (1.2)	516 (3.6)	7 (0.6)	471 (7.6)	10.6 (0.04)
Quebec, Canada	40 (1.1)	521 (2.8)	49 (0.8)	504 (3.1)	11 (0.7)	487 (6.0)	10.2 (0.04)
Abu Dhabi, UAE	35 (0.9)	489 (3.6)	51 (0.6)	442 (3.0)	14 (0.6)	397 (4.4)	9.9 (0.04)
Dubai, UAE	50 (0.8)	584 (2.3)	44 (0.8)	551 (2.4)	6 (0.3)	509 (5.8)	10.6 (0.03)
Sharjah, UAE	41 (0.9)	526 (4.1)	48 (0.9)	496 (3.8)	11 (0.6)	469 (8.6)	10.2 (0.04)

This TIMSS context questionnaire scale was established in 2023 based on the combined response distribution of countries that participated in TIMSS 2023. To provide a point of reference for country comparisons, the scale centerpoint of 10 was located at the mean of the combined distribution. The units of the scale were chosen so that 2 scale score points corresponded to the standard deviation of the distribution.

() Standard errors appear in parentheses. Because of rounding some results may appear inconsistent.

An "r" indicates data are available for at least 70% but less than 85% of the students.

SOURCE: IEA's Trends in International Mathematics and Science Study - TIMSS 2023
Downloaded from <https://timss2023.org/results>



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Exhibit 6.4.4: Students' Digital Self-Efficacy

Country	High Digital Self-Efficacy		Medium Digital Self-Efficacy		Low Digital Self-Efficacy		Average Scale Score
	Percent of Students	Average Achievement	Percent of Students	Average Achievement	Percent of Students	Average Achievement	
Australia	74 (0.9)	524 (3.2)	24 (0.8)	484 (5.7)	2 ~	~	10.6 (0.04)
Austria	69 (1.1)	520 (2.4)	29 (1.0)	502 (3.3)	2 ~	~	10.4 (0.04)
Azerbaijan	43 (1.1)	503 (4.1)	47 (0.9)	481 (4.2)	10 (0.6)	452 (8.3)	9.2 (0.05)
Bahrain	51 (0.8)	453 (3.2)	41 (0.7)	415 (3.0)	7 (0.5)	372 (5.6)	9.6 (0.04)
Brazil	44 (0.8)	406 (3.7)	46 (0.8)	375 (2.7)	10 (0.4)	348 (3.8)	9.3 (0.03)
Chile	61 (1.0)	431 (2.9)	35 (0.8)	403 (3.8)	4 (0.4)	363 (9.0)	10.1 (0.04)
Chinese Taipei	72 (0.9)	614 (3.1)	26 (0.8)	581 (4.1)	2 ~	~	10.7 (0.04)
Cote d'Ivoire	17 (1.8)	303 (15.8)	43 (1.6)	268 (4.3)	41 (2.5)	242 (2.4)	7.3 (0.14)
Cyprus	72 (0.8)	514 (2.8)	25 (0.8)	466 (4.1)	3 (0.3)	409 (9.4)	10.6 (0.03)
Czech Republic	51 (0.9)	529 (2.3)	46 (0.8)	511 (2.7)	3 (0.2)	476 (6.4)	9.6 (0.03)
England	71 (1.2)	541 (4.4)	27 (1.1)	502 (6.2)	2 ~	~	10.5 (0.05)
Finland	72 (0.6)	513 (2.6)	25 (0.6)	494 (3.0)	2 ~	~	10.6 (0.03)
France	59 (1.0)	487 (2.9)	39 (1.0)	475 (3.9)	2 ~	~	10.0 (0.03)
Georgia	59 (1.2)	481 (3.0)	38 (1.1)	456 (4.7)	3 (0.4)	444 (11.9)	9.9 (0.04)
Hong Kong SAR	63 (1.6)	594 (6.1)	32 (1.4)	553 (5.5)	5 (0.5)	507 (11.4)	10.3 (0.07)
Hungary	58 (1.2)	526 (3.2)	38 (1.1)	485 (4.5)	4 (0.4)	433 (12.0)	9.9 (0.05)
Iran, Islamic Rep. of	47 (1.1)	450 (3.7)	46 (0.9)	406 (3.8)	7 (0.5)	374 (6.3)	9.4 (0.04)
Ireland	74 (0.8)	530 (2.8)	25 (0.8)	508 (3.0)	1 ~	~	10.5 (0.04)
Israel	56 (1.0)	509 (4.6)	38 (0.8)	470 (3.5)	6 (0.4)	444 (7.1)	9.9 (0.04)
Italy	58 (1.1)	513 (2.7)	39 (1.0)	491 (4.0)	4 (0.3)	457 (9.4)	9.9 (0.04)
Japan	32 (1.0)	604 (4.6)	55 (0.9)	597 (3.2)	12 (0.6)	567 (5.1)	8.8 (0.04)
Jordan	47 (1.1)	407 (3.7)	43 (1.0)	385 (3.7)	9 (0.5)	345 (6.7)	9.4 (0.04)
Kazakhstan	32 (1.0)	477 (5.2)	58 (0.9)	450 (3.2)	10 (0.6)	422 (6.1)	8.9 (0.04)
Korea, Rep. of	61 (0.8)	610 (3.1)	34 (0.8)	584 (4.0)	5 (0.3)	526 (8.6)	10.2 (0.04)
Kuwait	49 (1.4)	420 (7.2)	45 (1.3)	387 (4.8)	6 (0.4)	349 (7.7)	9.5 (0.06)
Lithuania	67 (0.8)	529 (3.2)	30 (0.8)	488 (4.1)	3 (0.3)	463 (7.2)	10.3 (0.03)
Malaysia	27 (1.1)	451 (4.8)	61 (0.8)	402 (3.1)	12 (0.6)	370 (4.3)	8.7 (0.04)
Malta	72 (0.7)	517 (1.5)	26 (0.7)	476 (3.0)	3 (0.3)	417 (9.7)	10.4 (0.03)
Morocco	31 (0.9)	389 (3.1)	54 (0.8)	377 (3.3)	15 (0.8)	368 (4.7)	8.7 (0.05)
Norway (9)	78 (0.8)	513 (2.3)	20 (0.7)	476 (3.3)	2 ~	~	10.9 (0.04)
Oman	43 (0.8)	438 (3.0)	49 (0.8)	404 (3.0)	8 (0.4)	356 (4.9)	9.3 (0.03)
Palestinian Nat'l Auth.	38 (0.8)	406 (3.2)	49 (0.8)	384 (2.9)	14 (0.6)	353 (5.7)	9.0 (0.04)
Portugal	74 (0.8)	487 (2.5)	24 (0.8)	450 (3.5)	2 ~	~	10.6 (0.04)
Qatar	62 (1.3)	477 (4.5)	32 (1.2)	424 (4.3)	6 (0.5)	383 (8.8)	10.1 (0.06)
Romania	76 (1.1)	515 (4.6)	21 (1.0)	467 (6.1)	3 (0.4)	435 (16.9)	10.8 (0.05)
Saudi Arabia	62 (0.8)	412 (3.5)	33 (0.7)	388 (3.5)	4 (0.3)	357 (6.2)	10.1 (0.03)
Singapore	74 (1.2)	620 (5.1)	24 (1.0)	567 (8.7)	2 ~	~	10.7 (0.05)
South Africa (9)	22 (0.7)	425 (6.0)	61 (0.7)	389 (2.9)	16 (0.6)	380 (4.5)	8.4 (0.03)
Sweden	69 (0.9)	532 (2.5)	29 (0.8)	501 (3.1)	2 ~	~	10.4 (0.04)
Türkiye	61 (1.0)	527 (4.3)	36 (1.0)	488 (5.6)	4 (0.3)	430 (12.9)	10.0 (0.04)
United Arab Emirates	69 (0.4)	512 (1.9)	27 (0.4)	459 (1.9)	4 (0.2)	403 (4.2)	10.5 (0.02)
United States	70 (1.1)	507 (4.0)	27 (0.9)	461 (4.1)	3 (0.3)	404 (9.1)	10.5 (0.05)
Uzbekistan	42 (1.3)	436 (5.3)	50 (1.1)	419 (4.1)	9 (0.6)	405 (7.4)	9.2 (0.05)
International Average	56 (0.2)	492 (0.7)	37 (0.1)	459 (0.6)	6 (0.1)	408 (1.5)	
Benchmarking Participants							
Abu Dhabi, UAE	63 (0.9)	484 (2.6)	31 (0.8)	431 (2.9)	6 (0.4)	377 (5.0)	10.1 (0.03)
Dubai, UAE	77 (0.8)	561 (2.7)	21 (0.7)	512 (3.3)	2 ~	~	10.8 (0.04)
Sharjah, UAE	71 (1.0)	510 (5.7)	26 (0.9)	469 (4.2)	3 (0.3)	437 (7.6)	10.6 (0.06)

This TIMSS context questionnaire scale was established in 2023 based on the combined response distribution of countries that participated in TIMSS 2023. To provide a point of reference for country comparisons, the scale centerpoint of 10 was located at the mean of the combined distribution. The units of the scale were chosen so that 2 scale score points corresponded to the standard deviation of the distribution.

() Standard errors appear in parentheses. Because of rounding some results may appear inconsistent.
A tilde (~) indicates insufficient data to report result.

SOURCE: IEA's Trends in International Mathematics and Science Study - TIMSS 2023
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Exhibit 6.4.5: Students' Digital Self-Efficacy

Country	High Digital Self-Efficacy		Medium Digital Self-Efficacy		Low Digital Self-Efficacy		Average Scale Score
	Percent of Students	Average Achievement	Percent of Students	Average Achievement	Percent of Students	Average Achievement	
Australia	74 (0.9)	538 (2.9)	24 (0.8)	493 (5.5)	2 ~	~ ~	10.6 (0.04)
Austria	69 (1.1)	520 (2.4)	29 (1.0)	500 (4.0)	2 ~	~ ~	10.4 (0.04)
Azerbaijan	43 (1.1)	437 (3.3)	47 (0.9)	412 (3.2)	10 (0.6)	382 (6.0)	9.2 (0.05)
Bahrain	51 (0.8)	484 (3.3)	41 (0.7)	439 (3.2)	7 (0.5)	379 (5.3)	9.6 (0.04)
Brazil	44 (0.8)	448 (3.1)	46 (0.8)	418 (2.4)	10 (0.4)	387 (3.9)	9.3 (0.03)
Chile	61 (1.0)	472 (2.6)	35 (0.8)	442 (3.1)	4 (0.4)	397 (7.6)	10.1 (0.04)
Chinese Taipei	72 (0.9)	582 (2.4)	26 (0.8)	551 (3.4)	2 ~	~ ~	10.7 (0.04)
Cote d'Ivoire	17 (1.8)	258 (25.3)	43 (1.6)	190 (7.2)	41 (2.5)	147 (4.2)	7.3 (0.14)
Cyprus	72 (0.8)	486 (3.1)	25 (0.8)	432 (4.6)	3 (0.3)	377 (10.0)	10.6 (0.03)
Czech Republic	51 (0.9)	539 (2.1)	46 (0.8)	519 (2.5)	3 (0.2)	492 (6.8)	9.6 (0.03)
England	71 (1.2)	548 (4.1)	27 (1.1)	506 (6.0)	2 ~	~ ~	10.5 (0.05)
Finland	72 (0.6)	542 (3.2)	25 (0.6)	521 (3.9)	2 ~	~ ~	10.6 (0.03)
France	59 (1.0)	495 (3.0)	39 (1.0)	482 (3.7)	2 ~	~ ~	10.0 (0.03)
Georgia	59 (1.2)	464 (2.7)	38 (1.1)	438 (4.6)	3 (0.4)	421 (9.9)	9.9 (0.04)
Hong Kong SAR	63 (1.6)	548 (5.3)	32 (1.4)	504 (4.9)	5 (0.5)	464 (11.0)	10.3 (0.07)
Hungary	58 (1.2)	541 (2.8)	38 (1.1)	501 (4.0)	4 (0.4)	452 (10.6)	9.9 (0.05)
Iran, Islamic Rep. of	47 (1.1)	449 (3.5)	46 (0.9)	401 (3.9)	7 (0.5)	358 (6.3)	9.4 (0.04)
Ireland	74 (0.8)	535 (3.9)	25 (0.8)	512 (3.6)	1 ~	~ ~	10.5 (0.04)
Israel	56 (1.0)	504 (4.4)	38 (0.8)	462 (3.4)	6 (0.4)	423 (6.1)	9.9 (0.04)
Italy	58 (1.1)	514 (3.3)	39 (1.0)	491 (3.6)	4 (0.3)	445 (8.9)	9.9 (0.04)
Japan	32 (1.0)	567 (5.3)	55 (0.9)	559 (3.1)	12 (0.6)	531 (4.8)	8.8 (0.04)
Jordan	47 (1.1)	438 (4.0)	43 (1.0)	407 (4.2)	9 (0.5)	357 (6.2)	9.4 (0.04)
Kazakhstan	32 (1.0)	473 (4.4)	58 (0.9)	434 (2.7)	10 (0.6)	403 (4.7)	8.9 (0.04)
Korea, Rep. of	61 (0.8)	559 (2.3)	34 (0.8)	532 (2.8)	5 (0.3)	474 (8.6)	10.2 (0.04)
Kuwait	49 (1.4)	444 (7.3)	45 (1.3)	409 (5.1)	6 (0.4)	362 (8.6)	9.5 (0.06)
Lithuania	67 (0.8)	534 (3.0)	30 (0.8)	496 (3.8)	3 (0.3)	467 (6.2)	10.3 (0.03)
Malaysia	27 (1.1)	466 (4.6)	61 (0.8)	420 (3.6)	12 (0.6)	375 (4.9)	8.7 (0.04)
Malta	72 (0.7)	521 (2.1)	26 (0.7)	474 (3.3)	3 (0.3)	403 (10.8)	10.4 (0.03)
Morocco	31 (0.9)	340 (3.8)	54 (0.8)	326 (3.6)	15 (0.8)	313 (6.4)	8.7 (0.05)
Norway (9)	78 (0.8)	502 (2.6)	20 (0.7)	463 (3.3)	2 ~	~ ~	10.9 (0.04)
Oman	43 (0.8)	491 (2.8)	49 (0.8)	448 (3.0)	8 (0.4)	391 (5.6)	9.3 (0.03)
Palestinian Nat'l Auth.	38 (0.8)	422 (3.1)	49 (0.8)	395 (3.1)	14 (0.6)	356 (4.8)	9.0 (0.04)
Portugal	74 (0.8)	515 (2.2)	24 (0.8)	486 (3.3)	2 ~	~ ~	10.6 (0.04)
Qatar	62 (1.3)	509 (4.5)	32 (1.2)	453 (4.5)	6 (0.5)	403 (10.5)	10.1 (0.06)
Romania	76 (1.1)	484 (3.7)	21 (1.0)	447 (5.0)	3 (0.4)	414 (11.6)	10.8 (0.05)
Saudi Arabia	62 (0.8)	442 (3.6)	33 (0.7)	407 (4.1)	4 (0.3)	361 (7.0)	10.1 (0.03)
Singapore	74 (1.2)	623 (4.6)	24 (1.0)	564 (8.0)	2 ~	~ ~	10.7 (0.05)
South Africa (9)	22 (0.7)	409 (7.2)	61 (0.7)	351 (4.0)	16 (0.6)	336 (4.1)	8.4 (0.03)
Sweden	69 (0.9)	539 (3.0)	29 (0.8)	504 (3.8)	2 ~	~ ~	10.4 (0.04)
Türkiye	61 (1.0)	547 (3.4)	36 (1.0)	509 (4.8)	4 (0.3)	448 (9.1)	10.0 (0.04)
United Arab Emirates	69 (0.4)	516 (2.1)	27 (0.4)	449 (2.4)	4 (0.2)	370 (4.5)	10.5 (0.02)
United States	70 (1.1)	534 (3.4)	27 (0.9)	483 (4.3)	3 (0.3)	420 (8.8)	10.5 (0.05)
Uzbekistan	42 (1.3)	411 (4.4)	50 (1.1)	396 (3.9)	9 (0.6)	373 (6.9)	9.2 (0.05)
International Average	56 (0.2)	493 (0.8)	37 (0.1)	456 (0.6)	6 (0.1)	396 (1.3)	
Benchmarking Participants							
Abu Dhabi, UAE	63 (0.9)	485 (3.6)	31 (0.8)	412 (4.1)	6 (0.4)	331 (5.3)	10.1 (0.03)
Dubai, UAE	77 (0.8)	566 (2.9)	21 (0.7)	506 (3.6)	2 ~	~ ~	10.8 (0.04)
Sharjah, UAE	71 (1.0)	518 (6.0)	26 (0.9)	467 (4.1)	3 (0.3)	417 (8.1)	10.6 (0.06)

This TIMSS context questionnaire scale was established in 2023 based on the combined response distribution of countries that participated in TIMSS 2023. To provide a point of reference for country comparisons, the scale centerpoint of 10 was located at the mean of the combined distribution. The units of the scale were chosen so that 2 scale score points corresponded to the standard deviation of the distribution.

() Standard errors appear in parentheses. Because of rounding some results may appear inconsistent.

A tilde (~) indicates insufficient data to report result.

SOURCE: IEA's Trends in International Mathematics and Science Study - TIMSS 2023
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Student Use of Internet for Schoolwork

Eighth-grade students reported using the internet for a variety of different school tasks. The TIMSS 2023 Student Questionnaire asked eighth-grade students to report how frequently they used the internet for different types of schoolwork (Exhibit 6.4.6). Students indicated if they used the internet for these activities “at least once a week,” “once or twice a month,” or “never or almost never.”

On average internationally, the most common uses of the internet for schoolwork were accessing textbooks or other source materials and accessing assignments posted by teachers (Exhibit 6.4.7). A little over half of students (53%) reported using the internet for each of these tasks “at least once a week.” Other uses of the internet for schoolwork were less common internationally. Forty-three percent of students reported using the internet to collaborate with classmates or to find mathematics information, articles, or tutorials “at least once a week.” Forty percent of students reported using the internet “at least once a week” to ask the teacher questions, and 28 percent reported at least weekly usage to access learning games or activities related to mathematics or science.

Exhibit 6.4.6: Student Use of Internet for Schoolwork

About the Items

Exhibit 6.4.7 reports the percentage of students who responded “at least once a week” to each of six items.

How often do you use the internet to do the following tasks for mathematics or science schoolwork (including classroom tasks, homework, and studying outside of class)?

	At least once a week	Once or twice a month	Never or almost never
1) Access the textbook or other course materials -----	☐	☐	☐
2) Access assignments posted online by my teacher -----	☐	☐	☐
3) Collaborate with classmates on assignments or projects -----	☐	☐	☐
4) Ask my teacher questions -----	☐	☐	☐
5) Find information, articles, or tutorials about mathematics or science -----	☐	☐	☐
6) Access learning games or activities related to mathematics or science -----	☐	☐	☐

SOURCE: IEA's Trends in International Mathematics and Science Study - TIMSS 2023
Downloaded from <https://timss2023.org/results>

Exhibit 6.4.7: Student Use of Internet for Schoolwork

Country	Percent of Students Who Use the Internet for Schoolwork at Least Once a Week					
	Access the Textbook or Other Course Materials	Access Assignments Posted Online by Teacher	Collaborate with Classmates on Assignments or Projects	Ask the Teacher Questions	Find Information, Articles, or Tutorials about Mathematics or Science	Access Learning Games or Activities Related to Mathematics or Science
Australia	65 (1.0)	71 (1.1)	47 (1.0)	48 (1.0)	46 (1.0)	36 (1.0)
Austria	42 (1.2)	33 (1.8)	27 (1.1)	25 (0.8)	27 (0.8)	11 (0.6)
Azerbaijan	r 53 (0.8)	r 36 (1.0)	r 41 (0.9)	r 46 (1.0)	r 46 (1.0)	r 36 (1.0)
Bahrain	58 (1.0)	63 (0.9)	53 (0.9)	48 (0.8)	45 (0.8)	35 (0.7)
Brazil	52 (0.8)	39 (1.6)	60 (0.7)	46 (0.8)	43 (0.8)	27 (0.7)
Chile	35 (0.9)	32 (1.2)	56 (1.1)	37 (0.8)	44 (0.9)	22 (0.9)
Chinese Taipei	30 (0.9)	24 (1.1)	26 (0.7)	26 (0.7)	24 (0.8)	18 (0.7)
Cote d'Ivoire	25 (1.1)	20 (1.1)	25 (1.5)	23 (1.3)	28 (1.3)	25 (1.1)
Cyprus	36 (1.0)	33 (1.3)	23 (0.8)	36 (0.8)	27 (0.8)	16 (0.6)
Czech Republic	50 (0.9)	39 (1.5)	35 (0.8)	28 (0.7)	33 (0.8)	22 (0.7)
England	44 (1.4)	70 (1.5)	26 (1.0)	38 (0.9)	35 (1.1)	26 (1.1)
Finland	38 (1.4)	44 (1.3)	32 (1.0)	20 (0.8)	24 (0.8)	17 (0.8)
France	46 (1.3)	63 (1.2)	47 (1.0)	27 (1.0)	29 (0.9)	14 (0.7)
Georgia	54 (0.9)	r 52 (1.2)	r 38 (1.3)	r 26 (1.1)	r 49 (1.2)	r 36 (1.2)
Hong Kong SAR	47 (1.4)	48 (1.3)	33 (0.9)	30 (1.0)	36 (1.2)	26 (0.7)
Hungary	38 (0.7)	43 (1.4)	35 (0.9)	19 (0.7)	28 (0.8)	16 (0.7)
Iran, Islamic Rep. of	59 (0.9)	62 (1.0)	54 (0.9)	60 (1.0)	48 (0.8)	28 (0.8)
Ireland	59 (1.5)	69 (1.9)	31 (1.4)	38 (1.1)	35 (1.3)	16 (0.8)
Israel	51 (1.2)	44 (1.4)	42 (1.0)	48 (0.9)	41 (0.9)	21 (0.7)
Italy	61 (1.0)	77 (0.9)	32 (0.9)	41 (0.9)	31 (0.8)	14 (0.8)
Japan	23 (0.8)	20 (1.1)	16 (1.0)	9 (0.6)	13 (0.7)	10 (0.7)
Jordan	61 (1.0)	51 (0.9)	49 (0.9)	54 (1.0)	55 (1.0)	40 (0.9)
Kazakhstan	58 (0.8)	55 (1.0)	58 (0.8)	42 (0.7)	61 (0.7)	41 (0.8)
Korea, Rep. of	45 (0.9)	39 (1.0)	32 (0.8)	18 (0.8)	37 (0.8)	25 (0.8)
Kuwait	69 (0.9)	63 (1.0)	56 (0.9)	54 (1.4)	59 (1.1)	32 (0.9)
Lithuania	51 (0.9)	55 (1.1)	47 (0.8)	31 (0.9)	51 (0.8)	30 (0.7)
Malaysia	47 (0.8)	41 (0.9)	53 (0.9)	46 (0.8)	45 (0.8)	32 (0.6)
Malta	62 (0.8)	72 (0.7)	40 (0.8)	43 (0.9)	40 (0.7)	21 (0.7)
Morocco	65 (0.9)	48 (1.2)	48 (0.8)	59 (0.8)	55 (0.9)	36 (0.9)
Oman	66 (0.8)	53 (0.8)	59 (0.8)	47 (0.7)	50 (0.7)	34 (0.8)
Palestinian Nat'l Auth.	64 (0.9)	53 (0.9)	48 (1.0)	56 (0.8)	r 54 (1.0)	r 42 (0.9)
Portugal	50 (0.9)	63 (1.5)	60 (0.9)	33 (0.7)	39 (0.9)	24 (0.7)
Qatar	67 (0.9)	78 (1.0)	51 (1.3)	51 (1.1)	49 (1.1)	37 (1.1)
Romania	43 (1.3)	36 (1.4)	43 (1.1)	31 (1.2)	52 (1.0)	34 (1.1)
Saudi Arabia	80 (0.7)	78 (0.7)	64 (0.8)	57 (0.7)	52 (0.8)	40 (0.9)
Singapore	61 (1.1)	69 (1.5)	44 (1.2)	32 (1.0)	47 (1.0)	29 (0.9)
South Africa (9)	56 (0.7)	32 (0.9)	48 (0.8)	54 (0.7)	41 (0.7)	33 (0.6)
Sweden	66 (1.0)	79 (0.9)	45 (1.1)	50 (0.9)	55 (1.0)	31 (0.8)
Türkiye	56 (0.9)	58 (1.2)	27 (1.0)	32 (0.9)	55 (1.0)	24 (0.8)
United Arab Emirates	72 (0.4)	78 (0.4)	60 (0.5)	57 (0.5)	62 (0.4)	45 (0.5)
United States	57 (1.1)	78 (1.4)	48 (0.9)	49 (0.8)	48 (1.1)	37 (0.9)
Uzbekistan	62 (1.2)	r 57 (1.2)	52 (1.0)	r 63 (1.2)	r 53 (1.1)	51 (1.1)
International Average	53 (0.2)	53 (0.2)	43 (0.2)	40 (0.1)	43 (0.1)	28 (0.1)
Norway (9)	--	--	--	--	--	--
Benchmarking Participants						
Abu Dhabi, UAE	70 (0.5)	73 (0.8)	58 (0.8)	56 (0.8)	58 (0.7)	44 (0.8)
Dubai, UAE	73 (0.6)	82 (0.8)	58 (1.0)	54 (0.9)	60 (0.8)	38 (1.0)
Sharjah, UAE	72 (1.0)	78 (1.0)	62 (1.4)	57 (1.4)	64 (1.0)	47 (1.3)

() Standard errors appear in parentheses. Because of rounding some results may appear inconsistent.
 An "r" indicates data are available for at least 70% but less than 85% of the students.
 A dash (-) indicates comparable data not available.

SOURCE: IEA's Trends in International Mathematics and Science Study - TIMSS 2023
 Downloaded from <https://timss2023.org/results>

Environmental Awareness

Students' Environmental Knowledge

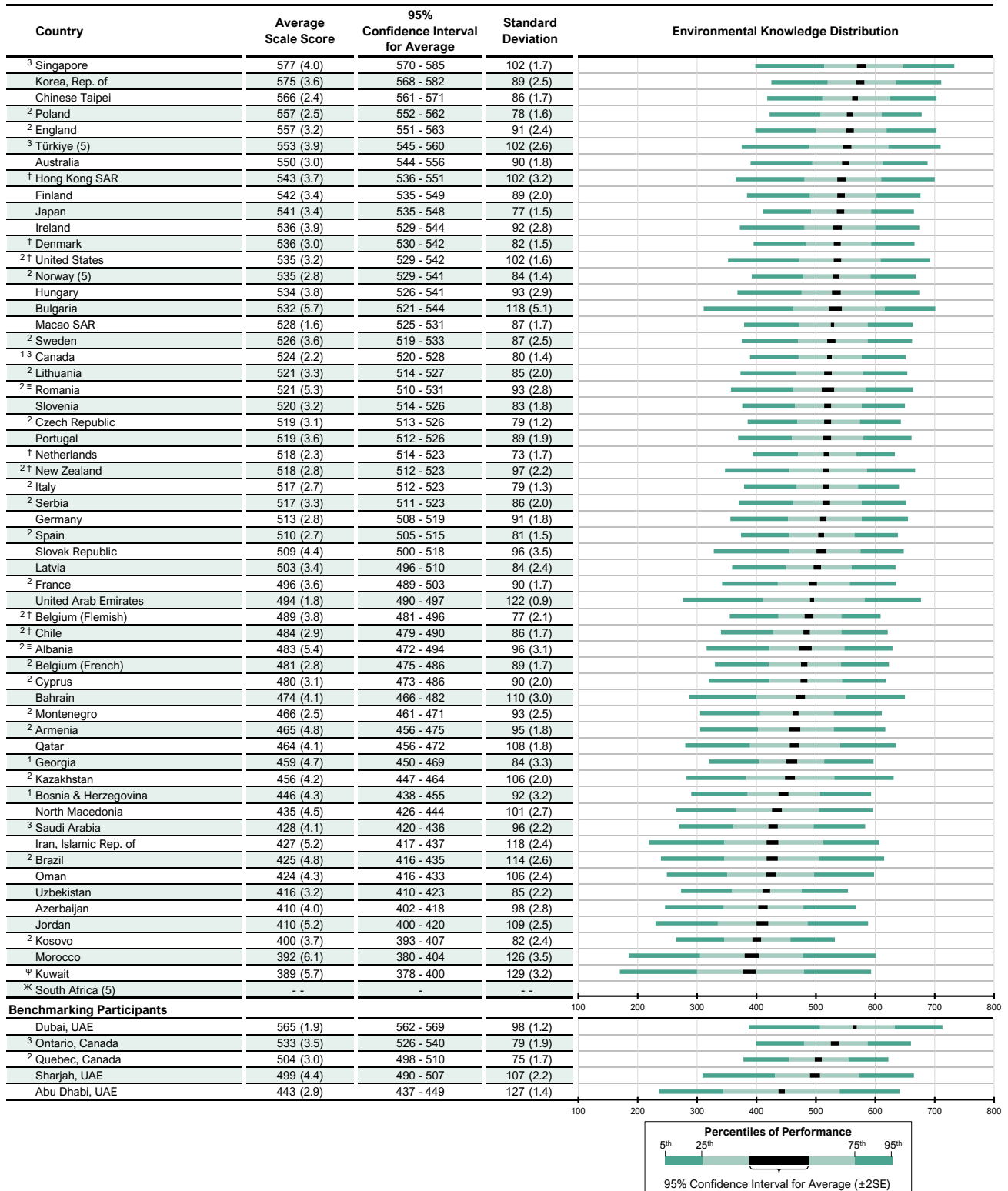
Average Environmental Knowledge and Scale Score Distributions

To understand what students around the world know about environmental issues, two environmental knowledge subscales were constructed based on the achievement items covering environmental science included in the TIMSS 2023 assessments. The TIMSS 2023 fourth- and eighth-grade science assessments included a range of items addressing a variety of environmental topics, including both local issues like water pollution to global issues such as climate change and its impact. Efforts were made in developing new science assessment material for TIMSS 2023 to increase coverage of environmental topics, while adhering to the prescribed assessment framework targets.

TIMSS 2023 items assessing environmental knowledge were selected by experts from the life and earth science content domains at the fourth grade and within the biology and earth science domains at the eighth grade. The fourth-grade environmental knowledge subscale included 44 items and the eighth-grade scale included 58 items. For information about how the subscales were created, see Chapter 12 in the *TIMSS 2023 Technical Report*.

Exhibits 7.1.1 and 7.1.2 present estimates of the average achievement on the environmental knowledge subscale, the corresponding confidence intervals, and standard deviations for the TIMSS 2023 participants at the fourth and eighth grade, respectively. Additionally, the exhibits include visualizations of the score distribution, illustrating percentiles of the distribution and the 95% confidence intervals of the average achievement.

Exhibit 7.1.1: Average Environmental Knowledge and Scale Score Distributions



() Standard errors appear in parentheses. Because of rounding some results may appear inconsistent.

See Appendix B.2 for population coverage notes 1, 2, and 3. See Appendix B.5 for sampling guidelines and sampling participation notes †, ‡, and =.

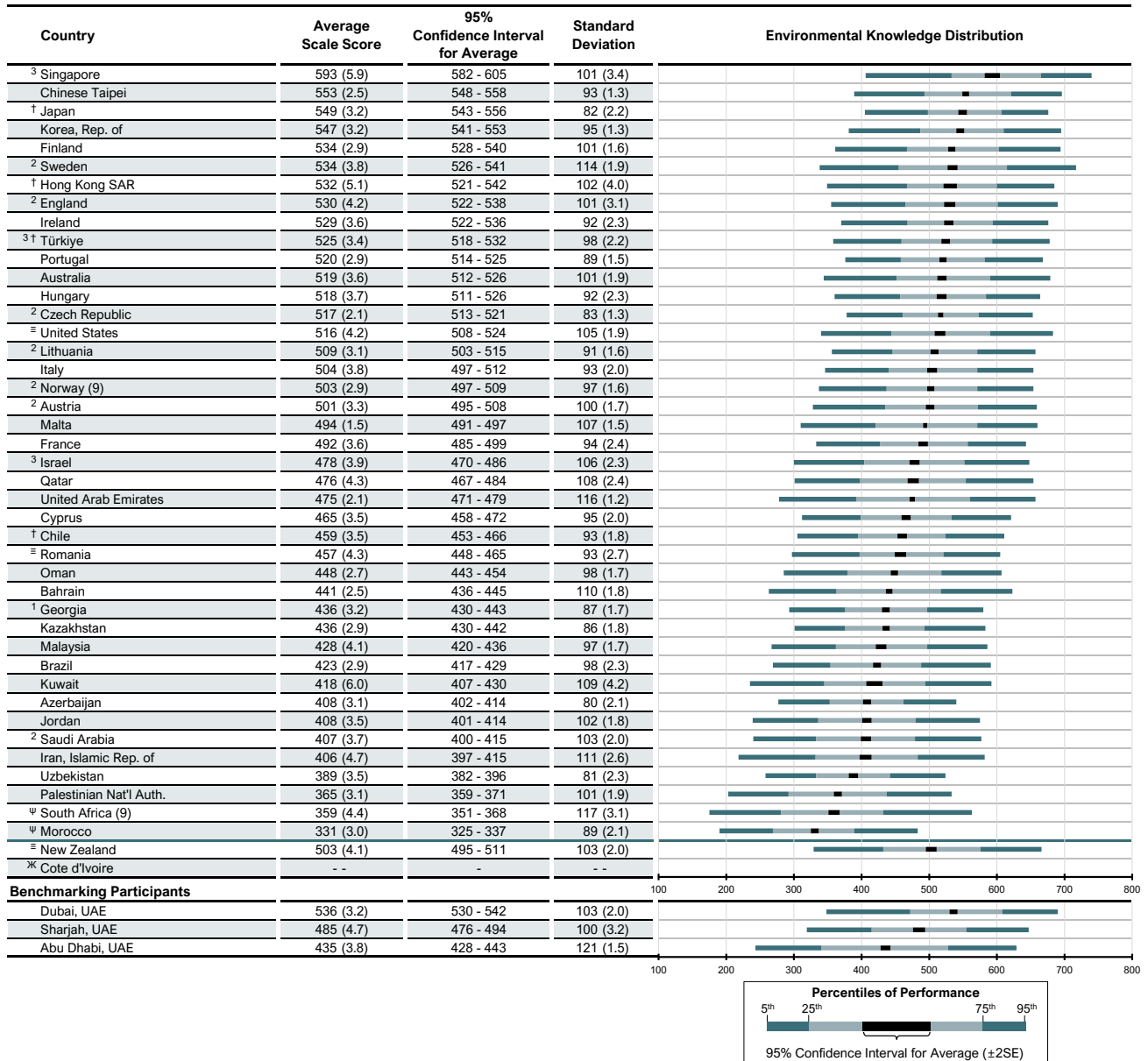
ψ Reservations about reliability because the percentage of students with achievement too low for estimation exceeds 15% but does not exceed 25%.

* Average achievement not reliably measured because the percentage of students with achievement too low for estimation exceeds 25%.

A dash (-) indicates comparable data not available because average achievement could not be accurately estimated.

SOURCE: IEA's Trends in International Mathematics and Science Study - TIMSS 2023
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Exhibit 7.1.2: Average Environmental Knowledge and Scale Score Distributions



() Standard errors appear in parentheses. Because of rounding some results may appear inconsistent.

See Appendix B.7 for population coverage notes 1, 2, and 3. See Appendix B.10 for sampling guidelines and sampling participation notes †, ‡, and ≡.

^ψ Reservations about reliability because the percentage of students with achievement too low for estimation exceeds 15% but does not exceed 25%.

* Average achievement not reliably measured because the percentage of students with achievement too low for estimation exceeds 25%.

A dash (-) indicates comparable data not available because average achievement could not be accurately estimated.

New Zealand did not satisfy guidelines for minimum school participation rates. Achievement could not be reliably estimated for Cote d'Ivoire.

SOURCE: IEA's Trends in International Mathematics and Science Study - TIMSS 2023
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TIMSS & PIRLS
BOSTON COLLEGE

Relative Achievement in Environmental Knowledge

Exhibits 7.1.3 and 7.1.4 show countries' average environmental knowledge relative to their overall average science achievement (presented from highest to lowest overall average science achievement) in the fourth and eighth grade, respectively. The exhibit also flags differences based on a test of statistical significance between the average environmental knowledge score and the overall science score using an alpha level of 0.01. At both grades, more countries had a relative weakness in environmental knowledge than a relative strength. For more details about students' overall science scores, see Exhibit 2.1.1 and Exhibit 2.2.1.

Of the 57 countries for which science subscale scores were estimated at the fourth grade, 13 countries had a relative strength in environmental knowledge compared to overall science and 19 countries had a relative weakness. Differences between environmental knowledge and overall science varied widely across countries, ranging from 30 points lower than the overall science scale to 15 points higher.

At the eighth grade, of the 42 countries for which science subscale scores were estimated, nine countries had a relative strength in environmental knowledge and 17 had a relative weakness. Average differences ranged from 28 points lower than overall science to 14 points higher.

Exhibit 7.1.3: Relative Achievement in Environmental Knowledge

Country	Overall Science Average Scale Score	Environmental Knowledge (44 Items)	
		Average Scale Score	Difference from Overall Score
³ Singapore	607 (2.8)	577 (4.0)	-30 (2.9) ▼
Korea, Rep. of	583 (2.5)	575 (3.6)	-8 (2.3) ▼
Chinese Taipei	573 (1.7)	566 (2.4)	-6 (1.4) ▼
³ Türkiye (5)	570 (3.4)	553 (3.9)	-18 (2.0) ▼
² England	556 (2.6)	557 (3.2)	1 (1.6)
Japan	555 (2.4)	541 (3.4)	-13 (2.1) ▼
² Poland	550 (2.2)	557 (2.5)	7 (2.4) ▲
Australia	550 (2.3)	550 (3.0)	1 (1.7)
¹ Hong Kong SAR	545 (3.8)	543 (3.7)	-2 (1.6)
Finland	542 (2.9)	542 (3.4)	0 (2.1)
² Lithuania	537 (2.9)	521 (3.3)	-16 (2.2) ▼
Macao SAR	536 (1.4)	528 (1.6)	-8 (1.9) ▼
² Sweden	533 (3.2)	526 (3.6)	-6 (2.0) ▼
^{2†} United States	532 (2.8)	535 (3.2)	3 (0.9) ▲
Ireland	532 (3.2)	536 (3.9)	4 (1.3) ▲
² Norway (5)	530 (2.6)	535 (2.8)	5 (2.5)
Bulgaria	530 (4.8)	532 (5.7)	3 (2.0)
^{2≡} Romania	526 (4.8)	521 (5.3)	-6 (2.5)
² Czech Republic	526 (2.3)	519 (3.1)	-6 (2.4) ▼
Slovenia	526 (2.3)	520 (3.2)	-5 (1.9) ▼
Latvia	526 (3.0)	503 (3.4)	-22 (1.8) ▼
Hungary	524 (3.2)	534 (3.8)	10 (2.3) ▲
[†] Denmark	522 (2.6)	536 (3.0)	14 (1.8) ▲
¹³ Canada	521 (2.0)	524 (2.2)	3 (1.1)
Slovak Republic	521 (3.3)	509 (4.4)	-12 (2.2) ▼
^{2†} New Zealand	517 (2.8)	518 (2.8)	1 (2.1)
[†] Netherlands	517 (2.9)	518 (2.3)	1 (1.6)
Germany	515 (2.8)	513 (2.8)	-2 (2.0)
Portugal	511 (2.3)	519 (3.6)	8 (2.0) ▲
² Italy	511 (2.5)	517 (2.7)	7 (1.7) ▲
² Serbia	510 (3.2)	517 (3.3)	7 (1.9) ▲
² Spain	504 (2.1)	510 (2.7)	6 (1.4) ▲
United Arab Emirates	495 (1.8)	494 (1.8)	-1 (0.6)
^{2≡} Albania	491 (4.5)	483 (5.4)	-8 (2.3) ▼
^{2†} Belgium (Flemish)	488 (2.6)	489 (3.8)	0 (2.7)
² France	488 (3.0)	496 (3.6)	8 (1.3) ▲
² Cyprus	487 (3.1)	480 (3.1)	-7 (1.0) ▼
² Belgium (French)	481 (2.8)	481 (2.8)	0 (1.9)
^{2†} Chile	479 (2.7)	484 (2.9)	5 (1.8) ▲
Bahrain	475 (3.9)	474 (4.1)	-1 (1.9)
Qatar	472 (3.6)	464 (4.1)	-8 (2.4) ▼
² Kazakhstan	467 (3.5)	456 (4.2)	-11 (1.7) ▼
¹ Georgia	465 (3.4)	459 (4.7)	-5 (2.3)
² Montenegro	461 (2.0)	466 (2.5)	5 (1.4) ▲
² Armenia	457 (2.7)	465 (4.8)	8 (3.5)
¹ Bosnia & Herzegovina	448 (3.7)	446 (4.3)	-2 (2.6)
North Macedonia	439 (3.9)	435 (4.5)	-4 (1.6)
Oman	433 (4.2)	424 (4.3)	-8 (1.8) ▼
Iran, Islamic Rep. of	432 (4.5)	427 (5.2)	-5 (2.5)
³ Saudi Arabia	428 (4.0)	428 (4.1)	1 (2.2)
² Brazil	425 (3.5)	425 (4.8)	0 (2.2)
Azerbaijan	422 (3.3)	410 (4.0)	-11 (2.3) ▼
Jordan	418 (4.9)	410 (5.2)	-8 (1.7) ▼
Uzbekistan	412 (3.5)	416 (3.2)	4 (2.1)
² Kosovo	403 (3.6)	400 (3.7)	-3 (1.7)
Morocco	390 (5.3)	392 (6.1)	2 (2.9)
^ψ Kuwait	373 (5.5)	389 (5.7)	15 (4.2) ▲
[✖] South Africa (5)	308 (4.7)	-	-
Benchmarking Participants			
Dubai, UAE	562 (1.8)	565 (1.9)	3 (0.9) ▲
³ Ontario, Canada	525 (3.2)	533 (3.5)	8 (1.6) ▲
² Quebec, Canada	508 (2.7)	504 (3.0)	-4 (1.5)
Sharjah, UAE	503 (3.9)	499 (4.4)	-4 (2.2)
Abu Dhabi, UAE	446 (2.6)	443 (2.9)	-3 (1.0) ▼

▲ ▼ Subscale score significantly different from overall score ($p < 0.01$)

Numbers of items are based on the TIMSS 2023 fourth-grade science items included in scaling.

() Standard errors appear in parentheses. Because of rounding some results may appear inconsistent.

See Appendix B.2 for population coverage notes 1, 2, and 3. See Appendix B.5 for sampling guidelines and sampling participation notes †, ‡, and ≡.

ψ Reservations about reliability because the percentage of students with achievement too low for estimation exceeds 15% but does not exceed 25%.

✖ Average achievement not reliably measured because the percentage of students with achievement too low for estimation exceeds 25%.

A dash (-) indicates comparable data not available because average achievement could not be accurately estimated.

SOURCE: IEA's Trends in International Mathematics and Science Study - TIMSS 2023
Downloaded from <https://timss2023.org/results>

Exhibit 7.1.4: Relative Achievement in Environmental Knowledge

Country	Overall Science Average Scale Score	Environmental Knowledge (58 Items)	
		Average Scale Score	Difference from Overall Score
³ Singapore	606 (5.7)	593 (5.9)	-13 (2.0) ▼
Chinese Taipei	572 (2.4)	553 (2.5)	-19 (1.7) ▼
[†] Japan	557 (3.1)	549 (3.2)	-8 (1.1) ▼
Korea, Rep. of	545 (2.2)	547 (3.2)	1 (1.9)
² England	531 (4.3)	530 (4.2)	-1 (1.6)
Finland	531 (3.2)	534 (2.9)	3 (1.3) ▲
^{3†} Türkiye	530 (3.6)	525 (3.4)	-4 (1.9)
[†] Hong Kong SAR	528 (4.7)	532 (5.1)	4 (1.5) ▲
² Czech Republic	527 (2.0)	517 (2.1)	-10 (0.9) ▼
Ireland	525 (3.5)	529 (3.6)	4 (1.3) ▲
Hungary	522 (3.3)	518 (3.7)	-3 (1.8)
² Sweden	521 (2.9)	534 (3.8)	12 (2.2) ▲
Australia	520 (3.2)	519 (3.6)	-1 (2.1)
² Lithuania	519 (3.0)	509 (3.1)	-11 (1.9) ▼
[±] United States	513 (3.9)	516 (4.2)	3 (1.0) ▲
² Austria	512 (2.4)	501 (3.3)	-11 (2.3) ▼
Portugal	506 (2.4)	520 (2.9)	14 (1.3) ▲
Malta	501 (1.6)	494 (1.5)	-7 (1.1) ▼
Italy	501 (3.2)	504 (3.8)	3 (1.6)
² Norway (9)	488 (2.6)	503 (2.9)	14 (1.1) ▲
United Arab Emirates	486 (2.0)	475 (2.1)	-11 (0.7) ▼
France	486 (3.2)	492 (3.6)	6 (2.3)
Qatar	481 (4.3)	476 (4.3)	-5 (1.3) ▼
³ Israel	481 (3.6)	478 (3.9)	-2 (1.7)
[±] Romania	466 (4.1)	457 (4.3)	-9 (1.7) ▼
Cyprus	464 (3.0)	465 (3.5)	1 (1.4)
Oman	456 (2.6)	448 (2.7)	-7 (1.7) ▼
[†] Chile	455 (2.7)	459 (3.5)	4 (2.6)
Bahrain	452 (2.6)	441 (2.5)	-11 (1.8) ▼
[†] Georgia	448 (2.9)	436 (3.2)	-11 (2.7) ▼
Kazakhstan	443 (3.0)	436 (2.9)	-6 (1.1) ▼
Malaysia	426 (3.7)	428 (4.1)	1 (1.5)
Brazil	420 (2.5)	423 (2.9)	3 (1.0) ▲
Kuwait	420 (5.8)	418 (6.0)	-1 (2.3)
² Saudi Arabia	419 (3.4)	407 (3.7)	-12 (1.0) ▼
Iran, Islamic Rep. of	419 (3.6)	406 (4.7)	-13 (2.4) ▼
Jordan	413 (3.6)	408 (3.5)	-5 (2.1)
Azerbaijan	411 (3.0)	408 (3.1)	-3 (1.5)
Uzbekistan	396 (3.7)	389 (3.5)	-7 (2.8)
Palestinian Nat'l Auth.	393 (2.9)	365 (3.1)	-28 (1.6) ▼
^ψ South Africa (9)	362 (4.0)	359 (4.4)	-3 (2.6)
^ψ Morocco	327 (3.4)	331 (3.0)	4 (1.1) ▲
[±] New Zealand	502 (4.0)	503 (4.1)	1 (1.3)
[*] Cote d'Ivoire	183 (8.2)	- -	- -
Benchmarking Participants			
Dubai, UAE	547 (3.2)	536 (3.2)	-11 (0.9) ▼
Sharjah, UAE	499 (4.9)	485 (4.7)	-13 (1.3) ▼
Abu Dhabi, UAE	443 (3.8)	435 (3.8)	-8 (1.0) ▼

▲ ▼ Subscale score significantly different from overall score ($p < 0.01$)

Numbers of items are based on the TIMSS 2023 eighth-grade science items included in scaling.

() Standard errors appear in parentheses. Because of rounding some results may appear inconsistent.

See Appendix B.7 for population coverage notes 1, 2, and 3. See Appendix B.10 for sampling guidelines and sampling participation notes †, ‡, and ±.

Ψ Reservations about reliability because the percentage of students with achievement too low for estimation exceeds 15% but does not exceed 25%.

✱ Average achievement not reliably measured because the percentage of students with achievement too low for estimation exceeds 25%.

A dash (-) indicates comparable data not available because average achievement could not be accurately estimated.

New Zealand did not satisfy guidelines for minimum school participation rates. Achievement could not be reliably estimated for Cote d'Ivoire.

SOURCE: IEA's Trends in International Mathematics and Science Study - TIMSS 2023
Downloaded from <https://timss2023.org/results>

Students' Attitudes Toward Environmental Preservation

Students Value Environmental Preservation

Students in the fourth and eighth grades who strongly value preservation of the environment tend to have a higher average achievement in environmental knowledge than those who place less value on environmental preservation. The items in the TIMSS 2023 *Students Value Environmental Preservation* scale (Exhibit 7.2.1) asked students to indicate their level of agreement with five statements (for fourth-grade students) or six statements (for eighth-grade students) about the value of preserving the environment. Based on their combined reports, students were classified into three groups: “very strongly value,” “strongly value,” and “somewhat value” environmental preservation. For the fourth grade and eighth grade, respectively, Exhibits 7.2.2 and 7.2.3 report the context scale results in relation to students’ achievement on the environmental knowledge subscale.

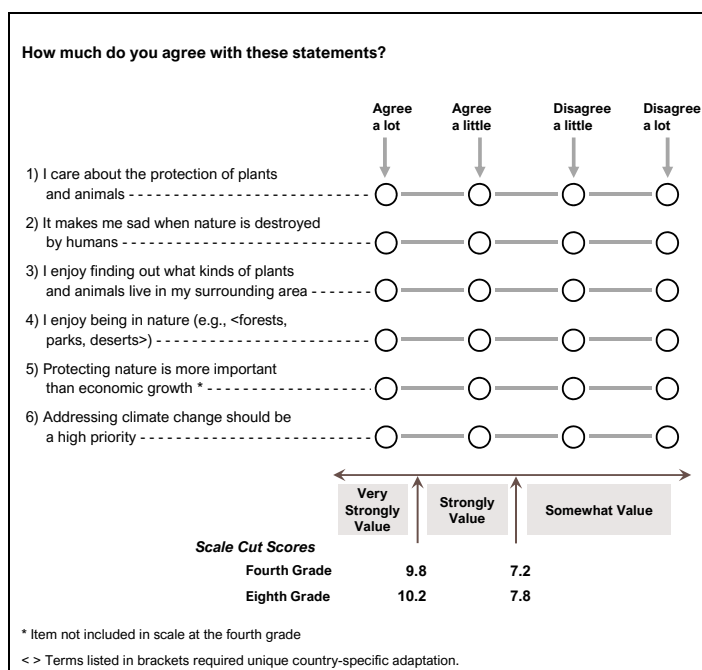
More than half of fourth-grade students strongly value environmental preservation (Exhibit 7.2.2). On average across countries, 56 percent of students “very strongly” valued environmental preservation, 38 percent “strongly” valued environmental preservation, and only six percent “somewhat” valued environmental preservation. There was a positive relationship between valuing environmental preservation and average environmental knowledge achievement, with students who “strongly” valued environmental preservation having an average achievement score 55 points higher than students who “somewhat” valued environmental preservation (510 vs. 455).

Internationally, a little less than half of eighth-grade students strongly value environmental preservation (Exhibit 7.2.3). On average across countries, 48 percent of students “very strongly” valued environmental preservation, 41 percent “strongly” valued environmental preservation, and 12 percent “somewhat” valued environmental preservation. There was a positive relationship between valuing environmental preservation and average environmental knowledge achievement. Students who “strongly” valued environmental preservation had an average achievement 37 points higher than students who “somewhat” valued environmental preservation (488 vs. 451).

Exhibit 7.2.1: Students Value Environmental Preservation

About the Scale

Students were scored according to their reports of how much they agreed with six statements about preservation of the environment on the *Students Value Environmental Preservation* scale. Cut scores divide the scale into three categories. Students who **Very Strongly Value** environmental preservation had a score at or above the cut score corresponding to “agreeing a lot” with three of the six statements and “agreeing a little” with the other three, on average. Students who **Somewhat Value** environmental preservation had a score at or below the cut score corresponding to “agreeing a little” with three of the six statements and “disagreeing a little” with the other three, on average. All other students **Strongly Value** environmental preservation.



SOURCE: IEA's Trends in International Mathematics and Science Study - TIMSS 2023
 Downloaded from <https://timss2023.org/results>



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Exhibit 7.2.2: Students Value Environmental Preservation

Country	Very Strongly Value		Strongly Value		Somewhat Value		Average Scale Score
	Percent of Students	Average Achievement	Percent of Students	Average Achievement	Percent of Students	Average Achievement	
Albania	77 (1.3)	494 (5.5)	21 (1.1)	475 (8.5)	2 ~	~ ~	11.0 (0.06)
Armenia	55 (1.1)	479 (5.3)	40 (0.9)	465 (5.7)	5 (0.4)	426 (13.8)	10.1 (0.05)
Australia	53 (1.1)	557 (3.8)	41 (1.0)	552 (4.2)	6 (0.4)	526 (8.0)	9.9 (0.04)
Azerbaijan	53 (1.1)	433 (4.3)	41 (0.9)	404 (5.3)	6 (0.4)	370 (8.8)	9.9 (0.04)
Bahrain	54 (1.0)	493 (4.4)	38 (0.9)	465 (4.6)	8 (0.5)	421 (9.8)	9.9 (0.05)
Belgium (Flemish)	54 (1.1)	505 (4.2)	39 (0.9)	480 (3.6)	7 (0.5)	435 (8.2)	9.9 (0.05)
Belgium (French)	54 (1.0)	500 (3.3)	38 (0.9)	467 (3.3)	7 (0.4)	443 (7.5)	10.0 (0.04)
Bosnia & Herzegovina	61 (1.4)	452 (4.9)	36 (1.3)	451 (6.3)	3 (0.4)	454 (15.8)	10.3 (0.05)
Brazil	53 (0.7)	454 (5.5)	40 (0.6)	432 (5.3)	7 (0.4)	375 (8.2)	9.9 (0.03)
Bulgaria	73 (1.3)	548 (4.6)	24 (1.1)	504 (10.5)	3 (0.5)	414 (31.8)	10.9 (0.07)
Canada	60 (0.7)	537 (2.2)	35 (0.6)	512 (2.8)	5 (0.2)	480 (6.6)	10.2 (0.03)
Chile	61 (1.0)	494 (3.5)	33 (0.9)	482 (3.7)	5 (0.4)	433 (8.5)	10.4 (0.04)
Chinese Taipei	53 (0.9)	569 (2.4)	40 (0.9)	566 (3.0)	8 (0.5)	559 (6.4)	9.8 (0.04)
Cyprus	69 (0.9)	487 (3.1)	28 (0.9)	470 (4.4)	3 (0.3)	442 (11.6)	10.6 (0.04)
Czech Republic	51 (1.0)	527 (3.5)	43 (0.9)	516 (3.2)	5 (0.3)	494 (6.2)	9.8 (0.04)
Denmark	37 (1.0)	552 (3.1)	50 (1.0)	536 (3.4)	13 (0.8)	497 (8.5)	9.1 (0.04)
England	57 (1.3)	572 (4.7)	36 (1.1)	548 (3.7)	7 (0.6)	518 (8.5)	10.0 (0.06)
Finland	49 (1.0)	557 (3.4)	43 (0.8)	538 (4.2)	8 (0.5)	502 (6.9)	9.6 (0.04)
France	54 (1.1)	514 (3.2)	40 (1.1)	484 (5.1)	6 (0.5)	450 (8.1)	10.0 (0.05)
Georgia	65 (1.3)	474 (5.1)	33 (1.2)	447 (4.7)	2 ~	~ ~	10.5 (0.05)
Germany	56 (0.9)	531 (3.0)	38 (0.8)	501 (4.0)	6 (0.4)	479 (8.6)	10.1 (0.04)
Hong Kong SAR	50 (1.1)	549 (4.9)	42 (0.8)	542 (5.1)	9 (0.6)	525 (9.4)	9.8 (0.05)
Hungary	59 (1.0)	549 (3.6)	36 (0.9)	522 (5.2)	5 (0.4)	483 (8.9)	10.2 (0.04)
Iran, Islamic Rep. of	72 (1.0)	440 (5.3)	25 (0.9)	410 (6.3)	3 (0.4)	364 (17.9)	10.8 (0.05)
Ireland	64 (1.0)	549 (3.7)	32 (0.9)	521 (5.0)	4 (0.4)	483 (14.1)	10.3 (0.04)
Italy	61 (0.9)	533 (3.5)	35 (0.9)	499 (3.3)	4 (0.3)	469 (10.0)	10.4 (0.04)
Japan	48 (1.2)	551 (3.9)	47 (1.1)	534 (4.7)	5 (0.4)	531 (7.7)	9.7 (0.04)
Jordan	49 (1.3)	424 (5.6)	41 (1.0)	405 (6.5)	10 (0.8)	392 (8.6)	9.9 (0.07)
Kazakhstan	46 (1.2)	479 (4.6)	49 (1.0)	445 (4.9)	5 (0.4)	414 (9.2)	9.6 (0.04)
Korea, Rep. of	34 (1.0)	585 (5.2)	54 (1.0)	573 (4.0)	12 (0.6)	560 (8.1)	9.1 (0.03)
Kosovo	62 (1.0)	413 (4.2)	35 (1.0)	389 (5.2)	3 (0.4)	356 (11.6)	10.2 (0.05)
Kuwait	54 (1.0)	417 (6.2)	40 (0.9)	380 (6.3)	6 (0.5)	322 (12.9)	10.0 (0.05)
Latvia	52 (1.3)	513 (3.1)	43 (1.2)	497 (4.9)	5 (0.5)	480 (10.6)	9.8 (0.05)
Lithuania	63 (0.9)	529 (3.2)	34 (0.9)	512 (5.4)	4 (0.3)	478 (11.2)	10.2 (0.03)
Macao SAR	54 (0.6)	533 (2.4)	40 (0.6)	524 (2.6)	6 (0.3)	516 (8.1)	9.9 (0.03)
Montenegro	63 (0.8)	481 (2.9)	32 (0.8)	455 (3.9)	5 (0.4)	428 (10.2)	10.4 (0.03)
Morocco	61 (1.7)	411 (6.5)	34 (1.5)	367 (7.6)	6 (0.4)	354 (10.0)	10.5 (0.09)
Netherlands	47 (1.2)	531 (3.1)	43 (1.2)	516 (2.8)	10 (0.7)	482 (7.3)	9.6 (0.06)
New Zealand	53 (0.9)	533 (3.4)	40 (0.8)	511 (3.7)	7 (0.5)	487 (9.2)	9.9 (0.04)
North Macedonia	68 (1.0)	460 (4.1)	27 (0.8)	420 (5.7)	4 (0.4)	381 (11.4)	10.6 (0.05)
Norway (5)	37 (0.9)	544 (3.2)	51 (0.7)	537 (4.0)	12 (0.6)	512 (6.3)	9.1 (0.04)
Oman	51 (0.8)	450 (4.6)	40 (0.8)	415 (5.0)	9 (0.5)	371 (8.3)	9.9 (0.04)
Poland	51 (1.0)	560 (3.2)	43 (0.9)	557 (2.8)	5 (0.4)	538 (7.3)	9.8 (0.04)
Portugal	73 (0.9)	523 (4.2)	25 (0.8)	512 (3.8)	2 ~	~ ~	10.7 (0.04)
Qatar	51 (0.9)	492 (4.0)	39 (0.8)	454 (4.4)	9 (0.4)	397 (9.6)	9.8 (0.04)
Romania	72 (1.2)	531 (5.2)	26 (1.1)	520 (6.3)	3 (0.4)	480 (19.4)	10.8 (0.05)
Saudi Arabia	47 (1.1)	456 (3.9)	40 (0.9)	427 (5.0)	13 (0.6)	396 (5.2)	9.6 (0.05)
Serbia	63 (1.2)	524 (3.8)	33 (1.1)	513 (3.5)	4 (0.4)	491 (9.3)	10.3 (0.05)
Singapore	54 (0.7)	588 (4.1)	39 (0.6)	570 (4.8)	7 (0.4)	550 (7.0)	10.0 (0.03)
Slovak Republic	52 (1.3)	523 (4.9)	42 (1.1)	503 (5.5)	6 (0.5)	462 (12.5)	9.8 (0.05)
Slovenia	57 (1.1)	524 (4.4)	39 (1.0)	522 (4.1)	4 (0.3)	483 (8.6)	10.1 (0.04)
Spain	63 (0.8)	520 (2.6)	33 (0.7)	500 (3.4)	4 (0.3)	457 (7.4)	10.4 (0.03)
Sweden	40 (1.0)	542 (4.7)	48 (0.9)	524 (4.6)	13 (0.6)	493 (6.3)	9.2 (0.04)
Türkiye (5)	75 (0.9)	559 (3.9)	22 (0.8)	540 (6.7)	2 ~	~ ~	10.8 (0.04)
United Arab Emirates	59 (0.4)	523 (1.7)	35 (0.3)	475 (2.6)	6 (0.2)	407 (5.0)	10.1 (0.02)
United States	50 (0.8)	557 (3.3)	42 (0.8)	529 (3.5)	8 (0.4)	490 (5.9)	9.7 (0.03)
Uzbekistan	59 (1.4)	433 (3.5)	36 (1.2)	405 (4.0)	5 (0.4)	369 (9.6)	10.3 (0.06)
International Average	56 (0.1)	510 (0.5)	38 (0.1)	488 (0.6)	6 (0.1)	455 (1.5)	
South Africa (5)	- -	- -	- -	- -	- -	- -	9.1 (0.05)
Benchmarking Participants							
Ontario, Canada	60 (1.0)	546 (3.5)	35 (1.0)	523 (4.4)	5 (0.4)	489 (9.4)	10.2 (0.04)
Quebec, Canada	56 (1.1)	517 (3.2)	39 (1.0)	493 (3.6)	6 (0.4)	469 (8.8)	10.0 (0.04)
Abu Dhabi, UAE	51 (0.8)	482 (2.7)	39 (0.6)	427 (4.1)	9 (0.4)	363 (5.8)	9.8 (0.04)
Dubai, UAE	65 (0.7)	579 (2.0)	31 (0.7)	552 (3.0)	4 (0.3)	506 (8.7)	10.3 (0.03)
Sharjah, UAE	62 (0.9)	521 (4.1)	32 (0.7)	480 (5.2)	5 (0.4)	420 (9.3)	10.3 (0.05)

This TIMSS context questionnaire scale was established in 2023 based on the combined response distribution of countries that participated in TIMSS 2023. To provide a point of reference for country comparisons, the scale centerpoint of 10 was located at the mean of the combined distribution. The units of the scale were chosen so that 2 scale score points corresponded to the standard deviation of the distribution.

() Standard errors appear in parentheses. Because of rounding some results may appear inconsistent.

An "r" indicates data are available for at least 70% but less than 85% of the students.

A dash (-) indicates comparable data not available because average achievement could not be accurately estimated. A tilde (~) indicates insufficient data to report result.

SOURCE: IEA's Trends in International Mathematics and Science Study - TIMSS 2023
Downloaded from <https://timss2023.org/results>



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Exhibit 7.2.3: Students Value Environmental Preservation

Country	Very Strongly Value		Strongly Value		Somewhat Value		Average Scale Score
	Percent of Students	Average Achievement	Percent of Students	Average Achievement	Percent of Students	Average Achievement	
Australia	38 (0.9)	540 (4.2)	45 (0.9)	519 (4.0)	17 (0.8)	497 (5.3)	9.6 (0.04)
Austria	33 (0.8)	526 (4.3)	49 (0.9)	502 (3.4)	18 (0.8)	464 (6.2)	9.4 (0.03)
Azerbaijan	54 (1.0)	420 (3.4)	37 (0.8)	413 (4.3)	9 (0.5)	399 (7.7)	10.3 (0.04)
Bahrain	53 (0.8)	455 (3.0)	37 (0.8)	442 (3.7)	10 (0.6)	426 (7.9)	10.2 (0.04)
Brazil	56 (0.8)	430 (3.2)	37 (0.8)	434 (4.4)	7 (0.4)	410 (6.4)	10.4 (0.03)
Chile	55 (1.0)	469 (4.2)	39 (0.9)	460 (3.4)	6 (0.5)	426 (9.3)	10.5 (0.04)
Chinese Taipei	37 (0.9)	557 (4.0)	50 (0.8)	553 (2.5)	13 (0.6)	554 (6.8)	9.7 (0.04)
Cyprus	58 (1.0)	476 (4.3)	34 (0.8)	466 (4.3)	8 (0.5)	448 (7.1)	10.5 (0.04)
Czech Republic	30 (0.7)	530 (2.7)	54 (0.7)	515 (2.3)	16 (0.5)	504 (3.7)	9.3 (0.02)
England	35 (1.1)	550 (5.6)	45 (0.9)	537 (5.3)	20 (0.9)	501 (6.3)	9.4 (0.05)
Finland	24 (0.8)	548 (6.1)	49 (0.9)	545 (3.0)	27 (0.9)	519 (3.6)	9.0 (0.04)
France	37 (1.0)	511 (4.3)	48 (1.0)	494 (4.1)	15 (0.9)	470 (4.5)	9.6 (0.04)
Georgia	62 (0.9)	443 (3.2)	33 (0.8)	446 (3.8)	5 (0.5)	424 (6.9)	10.6 (0.04)
Hong Kong SAR	37 (1.1)	536 (5.6)	49 (0.9)	531 (5.6)	15 (0.7)	535 (9.4)	9.7 (0.06)
Hungary	43 (1.0)	534 (3.7)	46 (0.9)	515 (4.5)	11 (0.6)	483 (7.4)	9.9 (0.04)
Iran, Islamic Rep. of	65 (0.7)	414 (4.0)	30 (0.7)	400 (6.7)	5 (0.3)	365 (10.8)	10.6 (0.03)
Ireland	44 (1.3)	545 (3.7)	43 (1.3)	527 (4.6)	13 (0.5)	504 (6.8)	9.9 (0.05)
Israel	36 (0.9)	489 (5.8)	44 (0.7)	488 (3.9)	21 (0.7)	455 (4.5)	9.5 (0.04)
Italy	48 (1.1)	517 (3.7)	43 (1.0)	500 (4.6)	10 (0.5)	465 (6.9)	10.0 (0.04)
Japan	32 (0.8)	553 (4.7)	55 (1.0)	552 (3.8)	12 (0.5)	542 (5.8)	9.5 (0.03)
Jordan	52 (1.0)	427 (3.6)	36 (0.7)	409 (4.6)	12 (0.6)	375 (7.8)	10.2 (0.04)
Kazakhstan	46 (0.9)	444 (3.5)	47 (0.8)	434 (3.2)	7 (0.4)	426 (7.1)	10.1 (0.03)
Korea, Rep. of	27 (0.8)	554 (5.0)	50 (0.9)	550 (3.1)	23 (0.6)	534 (5.1)	9.2 (0.03)
Kuwait	59 (1.1)	429 (4.8)	34 (0.9)	420 (7.5)	8 (0.5)	391 (14.1)	10.4 (0.04)
Lithuania	58 (0.8)	515 (3.3)	35 (0.8)	506 (3.6)	7 (0.4)	490 (6.4)	10.5 (0.03)
Malaysia	46 (0.9)	456 (4.5)	46 (0.8)	415 (3.8)	8 (0.4)	343 (6.3)	10.0 (0.03)
Malta	56 (0.8)	511 (2.3)	35 (0.8)	492 (3.3)	9 (0.5)	465 (8.0)	10.4 (0.03)
Morocco	62 (0.9)	334 (3.4)	30 (0.8)	333 (4.3)	7 (0.4)	326 (7.6)	10.6 (0.03)
Norway (9)	23 (0.7)	517 (4.1)	50 (0.8)	518 (3.2)	26 (0.7)	480 (4.6)	8.9 (0.03)
Oman	47 (0.9)	471 (3.5)	41 (0.8)	451 (2.9)	13 (0.5)	412 (5.8)	9.9 (0.03)
Palestinian Nat'l Auth.	52 (0.8)	393 (2.7)	35 (0.7)	361 (3.3)	13 (0.6)	326 (7.0)	10.2 (0.04)
Portugal	62 (0.9)	522 (2.6)	33 (0.8)	523 (4.4)	5 (0.3)	492 (9.3)	10.7 (0.03)
Qatar	55 (1.4)	490 (4.3)	34 (1.1)	478 (5.4)	11 (0.7)	444 (9.1)	10.3 (0.06)
Romania	69 (1.0)	467 (4.1)	24 (0.8)	461 (5.8)	6 (0.6)	445 (13.8)	11.0 (0.04)
Saudi Arabia	58 (0.8)	421 (4.1)	33 (0.7)	418 (3.9)	9 (0.4)	380 (6.9)	10.5 (0.03)
Singapore	42 (0.9)	602 (5.8)	46 (0.7)	592 (6.0)	12 (0.7)	573 (10.2)	9.9 (0.04)
South Africa (9)	40 (0.8)	378 (4.8)	49 (0.6)	347 (4.7)	11 (0.5)	338 (7.9)	9.6 (0.03)
Sweden	28 (1.1)	559 (4.7)	46 (0.9)	546 (4.7)	26 (1.0)	504 (5.1)	9.1 (0.05)
Türkiye	69 (1.0)	525 (3.3)	27 (0.9)	529 (5.5)	4 (0.4)	511 (12.6)	10.9 (0.04)
United Arab Emirates	58 (0.5)	487 (2.6)	33 (0.5)	483 (2.3)	9 (0.2)	449 (4.0)	10.6 (0.02)
United States	46 (0.8)	531 (4.6)	42 (0.6)	516 (4.4)	13 (0.5)	492 (5.3)	10.0 (0.03)
Uzbekistan	68 (1.0)	399 (3.5)	28 (0.9)	386 (4.5)	4 (0.4)	347 (10.2)	10.8 (0.05)
International Average	48 (0.1)	488 (0.6)	41 (0.1)	476 (0.7)	12 (0.1)	451 (1.2)	
Cote d'Ivoire	- -	- -	- -	- -	- -	- -	9.5 (0.05)
Benchmarking Participants							
Abu Dhabi, UAE	53 (0.8)	459 (4.2)	36 (0.7)	442 (3.9)	11 (0.4)	397 (5.6)	10.3 (0.03)
Dubai, UAE	53 (0.9)	542 (3.4)	37 (0.8)	542 (3.6)	9 (0.5)	525 (5.4)	10.3 (0.04)
Sharjah, UAE	68 (1.7)	492 (6.6)	26 (1.3)	486 (4.3)	6 (0.5)	461 (7.7)	11.0 (0.08)

This TIMSS context questionnaire scale was established in 2023 based on the combined response distribution of countries that participated in TIMSS 2023. To provide a point of reference for country comparisons, the scale centerpoint of 10 was located at the mean of the combined distribution. The units of the scale were chosen so that 2 scale score points corresponded to the standard deviation of the distribution.

() Standard errors appear in parentheses. Because of rounding some results may appear inconsistent.

An "r" indicates data are available for at least 70% but less than 85% of the students.

A dash (-) indicates comparable data not available because average achievement could not be accurately estimated.

SOURCE: IEA's Trends in International Mathematics and Science Study - TIMSS 2023
Downloaded from <https://timss2023.org/results>



TIMSS & PIRLS
BOSTON COLLEGE

APPENDIX A: Country Participation in TIMSS 2023 and Earlier TIMSS Assessments

Exhibit A.1: Country Participation in TIMSS 2023 and in Earlier TIMSS Assessments

Country	Grade 4							Grade 8							
	2023	2019	2015	2011	2007	2003	1995	2023	2019	2015	2011	2007	2003	1999	1995
Albania	●	●													
Armenia	●	●	●	●	○	●				●	●	○	●		
Australia	●	●	●	●	●	●	●	●	●	●	●	●	●	○	●
Austria		●		●	●		●								○
Azerbaijan	●	●		●				●							
Bahrain	●	●	●	●				●	●	●	●	●	●		
Belgium (Flemish)	●	●	●	●		●							●	●	●
Belgium (French)	●														●
Bosnia & Herzegovina	○	●										●			
Brazil	●							●							
Bulgaria	●	●	●									●	●	●	●
Canada	●	●	●				○			○				●	●
Chile	●	●	●	●				●	●	●	●		●	●	
Chinese Taipei	●	●	●	●	●	●		●	●	●	●	●	●	●	
Cote d'Ivoire								●							
Cyprus	●	●	●			●	●		●			●	●	●	●
Czech Republic	●	●	●	●	●		●	●				●		●	●
Denmark	●	●	●	●	●										●
England	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Finland	●	●	●	●				●	●		●			○	
France	●	●	●					●	●						●
Georgia	●	●	●	●	●			●	●	●	●	●			
Germany	●	●	●	●	●										●
Hong Kong SAR	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Hungary	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Iran, Islamic Rep. of	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Iraq	x														
Ireland	●	●	●	●			●	●	●	●					●
Israel							○	●	●	●	●	○	○	○	○
Italy	●	●	●	●	●	●	○	●	●	●	●	●	●	●	○
Japan	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Jordan	●		●					●	●	●	●	●	●	●	
Kazakhstan	●	●	○	●	○			●	●	○	●		●	●	●
Korea, Rep. of	●	●	●	●			●	●	●	●	●	●	●	●	●
Kosovo	●	●													
Kuwait	●	●	●	○	○		○	●	●	●		○			○
Latvia	●	●			○	●	○						●	○	○
Lithuania	●	●	●	●	●	●		●	●	●	●	●	●	●	●
Macao SAR	●														
Malaysia								●	●	●	●	●	●	●	
Malta		●		●				●		●		●			
Montenegro	●	●													
Morocco	●	●	●	●	○	○		●	●	●	●	○	○	○	
Netherlands	●	●	●	●	●	●	●						●	●	●
New Zealand	●	●	●	●	●	●	●	●	●	●	●		●	●	●
North Macedonia	●	●									●		●	●	
Norway	●	●	●	○	○	○	○	●	●	●	○	○	○		○
Oman	●	●	●	●				●	●	●	●	●			
Palestinian Nat'l Auth.								●			●	●	●		
Poland	●	●	●	○											
Portugal	●	●	●	●			●	●	●						●
Qatar	●	●	●	●	○			●	●	●	●	○			
Romania	●			●				●	●		●	●	●	●	●
Saudi Arabia	●	●	●	●				●	●	●	●	○	○		
Serbia	●	●	●	●								●	●		
Singapore	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Slovak Republic	●	●	●	●	●								●	●	●
Slovenia	●		●	●	●	●	●			●	●	●	●	○	●
South Africa	●	●	●					●	●	●	●		○	○	○
Spain	●	●	●	●											●
Sweden	●	●	●	●	●			●	●	●	●	●	●		●
Türkiye	○	●	○	○				○	●	●	●	○		○	
United Arab Emirates		●	●	●				●	●	●	●				
United States	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Uzbekistan	●							●							
Benchmarking Participants															
Ontario, Canada	●	●	●	●	●	●	●		●	●	●	●	●	●	●
Quebec, Canada	●	●	●	●	●	●	●		●	●	●	●	●	●	●
Kurdistan Region of Iraq	x														
Abu Dhabi, UAE		●	●	●				●	●	●	●				
Dubai, UAE	●	●	●	●	●			●	●	●	●	●			
Sharjah, UAE	●							●							

- Indicates participation in assessment cycle
- Indicates participation but data not comparable for measuring trends (e.g., due to differences in population coverage)
- x Indicates participation but data not internationally comparable

SOURCE: IEA's Trends in International Mathematics and Science Study - TIMSS 2023
Downloaded from <https://timss2023.org/results>

APPENDIX B: Population Coverage and Sample Participation Rates

Exhibit B.1: Information About the Students Assessed in TIMSS 2023

The TIMSS target populations are the grades that represent four years and eight years of schooling counting from the first year of ISCED Level 1. However, IEA has a policy that students do not fall under the minimum average age of 9.5 years old (Grade 4) or 13.5 years old (Grade 8) at the time of testing, so some countries assessed students in the fifth or ninth year of schooling.

Average age at the time of testing can vary across countries by just over a year (e.g., at the fourth grade from 9.8 to 11.3 years) depending on a country's policy on age of entry to school. For information on age of entry policy and practice, see the *TIMSS 2023 Encyclopedia*.

Country	Grade 4		Grade 8	
	Country's Name for Fourth Year of Schooling *	Average Age at Time of Testing	Country's Name for Eighth Year of Schooling *	Average Age at Time of Testing
Albania	Grade 4	10.1		
Armenia	Grade 4	9.9		
Australia	Year 4	10.1	Year 8	14.1
Austria			Grade 8	14.4
Azerbaijan	Grade 4	10.0	Grade 8	14.2
Bahrain	Grade 4	10.0	Grade 8	13.9
Belgium (Flemish)	Grade 4	10.0		
Belgium (French)	Grade 4	9.9		
Bosnia & Herzegovina	Grade 4	10.2		
Brazil	Grade 4	10.0	Grade 8	14.1
Bulgaria	Grade 4	10.7		
Canada	Grade 4	9.9		
Chile	Grade 4	10.2	Grade 8	14.2
Chinese Taipei	Grade 4	10.3	Grade 8	14.2
Cote d'Ivoire			Grade 8	15.0
Cyprus	Grade 4	9.9	Grade 8	13.8
Czech Republic	Grade 4	10.4	Grade 8	14.3
Denmark	Grade 4	10.9		
England	Year 5	10.3	Year 9	14.0
Finland	Grade 4	10.8	Grade 8	14.9
France	Third Cycle Year 1	9.9	Fourth Cycle Year 2	13.9
Georgia	Grade 4	10.2	Grade 8	14.1
Germany	Grade 4	10.4		
Hong Kong SAR	Primary 4	10.1	Secondary 2	14.2
Hungary	Grade 4	10.6	Grade 8	14.5
Iran, Islamic Rep. of	Grade 4	10.2	Grade 8	14.2
Iraq	Grade 4	10.3		
Ireland	Fourth Class	10.5	Second Year	14.4
Israel			Grade 8	14.0
Italy	Primary Grade 4	9.8	Lower Secondary Grade 3	13.8
Japan	Grade 4	10.5	Grade 8	14.5
Jordan	Grade 4	9.9	Grade 8	14.0
Kazakhstan	Grade 4	10.2	Grade 8	14.4
Korea, Rep. of	Elementary School Grade 4	10.4	Middle School Grade 2	14.4
Kosovo	Grade 4	10.0		
Kuwait	Grade 4	9.8	Grade 8	13.8
Latvia	Grade 4	10.9		
Lithuania	Grade 4	10.8	Grade 8	14.8
Macao SAR	Primary 4	9.9		
Malaysia			Form 2	14.2
Malta			Year 9	13.7
Montenegro	Grade 4	9.9		
Morocco	Grade 4	10.1	Secondary School Year 2	14.4
Netherlands	Group 6	10.0		
New Zealand	Year 5	10.0	Year 9	13.9
North Macedonia	Grade 4	9.9		
Norway	Grade 5	10.8	Grade 9	14.8
Oman	Grade 4	9.8	Grade 8	13.8
Palestinian Nat'l Auth.			Grade 8	13.9
Poland	Grade 4	10.9		
Portugal	Grade 4	10.1	Grade 8	14.1
Qatar	Grade 4	10.0	Grade 8	14.0
Romania	Grade 4	11.1	Grade 8	15.0
Saudi Arabia	Grade 4	9.9	Grade 8	14.0
Serbia	Grade 4	10.7		
Singapore	Primary 4	10.4	Secondary 2	14.3
Slovak Republic	Grade 4	10.5		
Slovenia	Grade 4	10.0		
South Africa	Grade 5	11.3	Grade 9	15.5
Spain	Grade 4	10.0		
Sweden	Grade 4	10.8	Grade 8	14.8
Türkiye	Grade 5	10.9	Grade 8	13.9
United Arab Emirates	Grade 4	10.0	Grade 8	13.8
United States	Grade 4	10.2	Grade 8	14.2
Uzbekistan	Grade 4	10.6	Grade 8	14.7
Benchmarking Participants				
Ontario, Canada	Grade 4	9.8		
Quebec, Canada	Grade 4	10.1		
Kurdistan Region of Iraq	Grade 4	10.1		
Abu Dhabi, UAE	Grade 4	9.9	Grade 8	13.8
Dubai, UAE	Grade 4 or Year 5	10.1	Grade 8 or Year 9	13.9
Sharjah, UAE	Grade 4	10.0	Grade 8	13.8

* Countries' names for the fourth year and eighth year of formal schooling were reported by National Research Coordinators.
An empty cell indicates country did not participate at that grade.

SOURCE: IEA's Trends in International Mathematics and Science Study - TIMSS 2023
Downloaded from <https://timss2023.org/results>

Exhibit B.2: Coverage of TIMSS 2023 Target Population

Country	International Target Population		Exclusions from National Target Population		
	Coverage	Notes on Coverage	School-Level Exclusions	Within-Sample Exclusions	Overall Exclusions
² Albania	100%		4.4%	3.8%	8.2%
² Armenia	100%		0.9%	5.3%	6.1%
Australia	100%		1.9%	1.9%	3.7%
Azerbaijan	100%		2.0%	0.9%	2.9%
Bahrain	100%		0.3%	0.7%	1.1%
² Belgium (Flemish)	100%		1.0%	4.7%	5.7%
² Belgium (French)	100%		5.3%	3.6%	8.9%
¹ Bosnia & Herzegovina	62%	Students in regions other than Republika Srpska and West Herzegovina Canton	0.9%	1.6%	2.5%
² Brazil	100%		3.9%	2.6%	6.5%
Bulgaria	100%		0.6%	3.0%	3.7%
^{1 3} Canada	79%	Students from the provinces of Alberta, Manitoba, Newfoundland, Ontario, and Quebec	3.2%	11.1%	14.3%
² Chile	100%		1.1%	4.5%	5.6%
Chinese Taipei	100%		0.3%	2.3%	2.6%
² Cyprus	100%		1.9%	5.0%	7.0%
² Czech Republic	100%		2.8%	4.5%	7.3%
Denmark	100%		2.3%	3.0%	5.2%
² England	100%		1.9%	3.6%	5.5%
Finland	100%		1.3%	1.1%	2.4%
² France	100%		2.8%	3.0%	5.8%
¹ Georgia	93%	Students taught in Georgian	1.2%	2.3%	3.5%
Germany	100%		1.5%	2.9%	4.4%
Hong Kong SAR	100%		1.1%	0.5%	1.6%
Hungary	100%		2.6%	2.5%	5.1%
Iran, Islamic Rep. of	100%		0.6%	0.0%	0.7%
Ireland	100%		2.2%	1.5%	3.7%
² Italy	100%		0.9%	6.1%	7.0%
Japan	100%		0.8%	1.8%	2.5%
Jordan	100%		0.0%	0.3%	0.3%
² Kazakhstan	100%		2.0%	3.8%	5.8%
Korea, Rep. of	100%		1.2%	2.2%	3.4%
² Kosovo	100%		4.7%	3.4%	8.1%
Kuwait	100%		0.6%	0.1%	0.7%
Latvia	100%		3.6%	1.1%	4.7%
² Lithuania	100%		2.8%	5.9%	8.6%
Macao SAR	100%		0.0%	3.4%	3.4%
² Montenegro	100%		2.1%	6.6%	8.7%
Morocco	100%		1.6%	0.0%	1.6%
Netherlands	100%		2.9%	1.5%	4.4%
² New Zealand	100%		3.3%	5.1%	8.5%
North Macedonia	100%		1.5%	2.0%	3.5%
² Norway (5)	100%		2.1%	4.0%	6.1%
Oman	100%		1.0%	1.4%	2.4%
² Poland	100%		1.9%	4.6%	6.5%
Portugal	100%		1.1%	3.2%	4.3%
Qatar	100%		2.3%	1.0%	3.3%
² Romania	100%		3.9%	2.5%	6.5%
³ Saudi Arabia	100%		9.1%	2.1%	11.2%
² Serbia	100%		4.7%	5.4%	10.2%
³ Singapore	100%		13.4%	0.1%	13.5%
Slovak Republic	100%		0.9%	1.5%	2.5%
Slovenia	100%		2.3%	2.8%	5.1%
South Africa (5)	100%		0.2%	0.0%	0.2%
² Spain	100%		1.9%	4.1%	6.0%
² Sweden	100%		1.6%	4.7%	6.2%
³ Türkiye (5)	100%		1.2%	20.7%	21.9%
United Arab Emirates	100%		0.8%	2.0%	2.8%
² United States	100%		0.0%	5.5%	5.5%
Uzbekistan	100%		4.3%	0.8%	5.1%
Benchmarking Participants					
³ Ontario, Canada	100%		2.0%	11.2%	13.2%
² Quebec, Canada	100%		2.7%	6.1%	8.8%
Abu Dhabi, UAE	100%		0.8%	2.7%	3.5%
Dubai, UAE	100%		1.6%	2.0%	3.6%
Sharjah, UAE	100%		0.3%	1.1%	1.4%

1 National Target Population does not include all of the International Target Population.

2 National Defined Population covers 90% to 95% of National Target Population.

3 National Defined Population covers less than 90% of National Target Population (but at least 74%).

Exhibit B.3: School Sample Sizes

Country	Number of Schools in Original Sample	Number of Eligible Schools in Original Sample	Number of Schools in Original Sample that Participated	Number of Replacement Schools that Participated	Total Number of Schools that Participated
Albania	200	200	108	0	108
Armenia	150	150	146	3	149
Australia	288	288	281	2	283
Azerbaijan	200	200	190	9	199
Bahrain	187	187	187	0	187
Belgium (Flemish)	160	159	114	32	146
Belgium (French)	166	166	157	8	165
Bosnia & Herzegovina	121	121	120	0	120
Brazil	886	830	741	55	796
Bulgaria	154	154	148	5	153
Canada	792	785	629	31	660
Chile	182	182	142	36	178
Chinese Taipei	218	218	212	3	215
Cyprus	150	150	148	0	148
Czech Republic	200	195	195	0	195
Denmark	164	163	126	32	158
England	152	152	127	4	131
Finland	172	170	170	0	170
France	162	161	159	0	159
Georgia	156	156	151	5	156
Germany	230	230	223	7	230
Hong Kong SAR	156	156	118	21	139
Hungary	155	154	154	0	154
Iran, Islamic Rep. of	224	224	224	0	224
Ireland	154	153	152	1	153
Italy	152	152	146	6	152
Japan	150	149	133	8	141
Jordan	224	224	224	0	224
Kazakhstan	186	185	181	4	185
Korea, Rep. of	156	156	146	10	156
Kosovo	152	152	152	0	152
Kuwait	162	162	150	0	150
Latvia	160	156	149	5	154
Lithuania	191	190	188	2	190
Macao SAR	60	59	59	0	59
Montenegro	141	141	141	0	141
Morocco	272	271	270	0	270
Netherlands	152	152	79	44	123
New Zealand	176	176	110	44	154
North Macedonia	150	150	149	0	149
Norway (5)	169	167	159	1	160
Oman	222	222	219	1	220
Poland	150	150	147	3	150
Portugal	166	164	158	6	164
Qatar	279	279	279	0	279
Romania	195	183	126	4	130
Saudi Arabia	220	214	208	6	214
Serbia	160	159	157	1	158
Singapore	181	181	181	0	181
Slovak Republic	162	162	160	2	162
Slovenia	150	150	144	5	149
South Africa (5)	303	297	282	3	285
Spain	526	525	523	1	524
Sweden	164	161	159	1	160
Türkiye (5)	168	141	111	30	141
United Arab Emirates	773	768	755	0	755
United States	300	293	182	60	242
Uzbekistan	166	166	166	0	166
Benchmarking Participants					
Ontario, Canada	172	171	162	1	163
Quebec, Canada	174	174	136	10	146
Abu Dhabi, UAE	293	293	286	0	286
Dubai, UAE	205	202	201	0	201
Sharjah, UAE	147	146	144	0	144

SOURCE: IEA's Trends in International Mathematics and Science Study - TIMSS 2023
Downloaded from <https://timss2023.org/results>

Exhibit B.4: Student Sample Sizes

Country	Within-School Student Participation (Weighted Percentage)	Number of Students Sampled in Participating Schools	Number of Students Withdrawn from Class/School	Number of Students Excluded	Number of Students Eligible	Number of Students Absent	Number of Students Assessed
Albania	92%	2,709	46	67	2,596	222	2,374
Armenia	96%	5,234	50	101	5,083	228	4,855
Australia	91%	6,223	107	118	5,998	528	5,470
Azerbaijan	93%	6,609	53	33	6,523	466	6,057
Bahrain	98%	5,691	86	50	5,555	120	5,435
Belgium (Flemish)	91%	5,005	24	192	4,789	453	4,336
Belgium (French)	95%	5,413	60	217	5,136	261	4,875
Bosnia & Herzegovina	91%	3,763	15	58	3,690	299	3,391
Brazil	95%	25,472	1,344	693	23,435	1,305	22,130
Bulgaria	95%	4,469	45	106	4,318	215	4,103
Canada	95%	16,298	208	1,628	14,462	746	13,716
Chile	90%	5,321	115	169	5,037	500	4,537
Chinese Taipei	96%	5,719	63	127	5,529	221	5,308
Cyprus	96%	5,307	19	260	5,028	199	4,829
Czech Republic	96%	7,440	44	294	7,102	280	6,822
Denmark	94%	5,736	97	121	5,518	352	5,166
England	94%	4,480	28	100	4,352	261	4,091
Finland	95%	6,133	31	31	6,071	268	5,803
France	98%	5,070	59	167	4,844	105	4,739
Georgia	98%	4,688	37	115	4,536	125	4,411
Germany	95%	4,864	64	144	4,656	214	4,442
Hong Kong SAR	90%	4,634	18	1	4,615	474	4,141
Hungary	96%	5,620	40	102	5,478	237	5,241
Iran, Islamic Rep. of	97%	6,405	82	2	6,321	183	6,138
Ireland	93%	5,233	68	67	5,098	348	4,750
Italy	96%	4,970	14	307	4,649	196	4,453
Japan	95%	4,119	15	27	4,077	202	3,875
Jordan	97%	6,500	267	22	6,211	146	6,065
Kazakhstan	98%	6,787	42	102	6,643	135	6,508
Korea, Rep. of	96%	4,719	85	88	4,546	191	4,355
Kosovo	95%	5,028	71	126	4,831	222	4,609
Kuwait	96%	4,731	79	0	4,652	166	4,486
Latvia	92%	4,721	13	30	4,678	379	4,299
Lithuania	92%	5,181	21	241	4,919	399	4,520
Macao SAR	94%	6,067	22	171	5,874	361	5,513
Montenegro	95%	4,839	18	170	4,651	234	4,417
Morocco	98%	8,116	127	0	7,989	143	7,846
Netherlands	95%	3,801	7	54	3,740	185	3,555
New Zealand	89%	5,809	25	206	5,578	631	4,947
North Macedonia	93%	5,261	165	97	4,999	366	4,633
Norway (5)	92%	6,076	55	235	5,786	485	5,301
Oman	97%	8,524	73	64	8,387	319	8,068
Poland	89%	5,589	41	285	5,263	597	4,666
Portugal	97%	5,638	57	182	5,399	185	5,214
Qatar	96%	6,792	66	75	6,651	239	6,412
Romania	87%	4,084	14	21	4,049	490	3,559
Saudi Arabia	98%	5,725	9	73	5,643	128	5,515
Serbia	94%	4,866	19	124	4,723	374	4,349
Singapore	95%	6,873	13	2	6,858	328	6,530
Slovak Republic	96%	5,086	27	72	4,987	199	4,788
Slovenia	92%	5,312	16	144	5,152	406	4,746
South Africa (5)	87%	11,898	0	0	11,898	1,474	10,424
Spain	93%	11,340	0	389	10,951	735	10,216
Sweden	95%	5,743	60	243	5,440	301	5,139
Türkiye (5)	98%	4,998	167	188	4,643	102	4,541
United Arab Emirates	96%	37,155	114	727	36,314	1,472	34,842
United States	93%	10,532	175	537	9,820	730	9,090
Uzbekistan	99%	4,527	10	12	4,505	48	4,457
Benchmarking Participants							
Ontario, Canada	95%	5,172	119	550	4,503	237	4,266
Quebec, Canada	96%	4,349	16	303	4,030	149	3,881
Abu Dhabi, UAE	97%	13,399	64	329	13,006	448	12,558
Dubai, UAE	95%	10,052	6	221	9,825	531	9,294
Sharjah, UAE	95%	7,278	24	93	7,161	297	6,864

Students attending a sampled class at the time the sample was chosen but leaving the class before the assessment was administered were classified as "withdrawn."

Students with a disability or language barrier that prevented them from participating in the assessment were classified as "excluded."

Students not present when the assessment was administered, and not subsequently assessed in a make-up session, were classified as "absent."

Exhibit B.5: Participation Rates (Weighted)

Country	School Participation		Class Participation	Student Participation	Overall Participation	
	Before Replacement	After Replacement			Before Replacement	After Replacement
[≡] Albania	54%	54%	97%	92%	48%	48%
Armenia	98%	99%	100%	96%	94%	95%
Australia	98%	99%	100%	91%	90%	90%
Azerbaijan	95%	99%	100%	93%	88%	92%
Bahrain	100%	100%	100%	98%	98%	98%
[†] Belgium (Flemish)	74%	92%	99%	91%	67%	84%
Belgium (French)	95%	99%	100%	95%	90%	94%
Bosnia & Herzegovina	99%	99%	96%	91%	87%	87%
Brazil	83%	95%	100%	95%	79%	90%
Bulgaria	96%	99%	100%	95%	92%	94%
Canada	81%	85%	100%	95%	77%	81%
[†] Chile	79%	98%	100%	90%	71%	89%
Chinese Taipei	97%	99%	100%	96%	93%	95%
Cyprus	99%	99%	100%	96%	95%	95%
Czech Republic	100%	100%	100%	96%	96%	96%
[†] Denmark	76%	97%	100%	94%	71%	91%
England	84%	86%	100%	94%	79%	81%
Finland	100%	100%	100%	95%	95%	95%
France	99%	99%	100%	98%	97%	97%
Georgia	97%	100%	100%	98%	95%	98%
Germany	97%	100%	100%	95%	93%	95%
[†] Hong Kong SAR	76%	89%	99%	90%	68%	80%
Hungary	100%	100%	100%	96%	96%	96%
Iran, Islamic Rep. of	100%	100%	100%	97%	97%	97%
Ireland	99%	100%	100%	93%	93%	93%
Italy	96%	100%	100%	96%	92%	96%
Japan	89%	94%	100%	95%	84%	90%
Jordan	100%	100%	100%	97%	97%	97%
Kazakhstan	98%	100%	100%	98%	96%	98%
Korea, Rep. of	93%	100%	100%	96%	89%	96%
Kosovo	100%	100%	100%	95%	95%	95%
Kuwait	93%	93%	100%	96%	89%	89%
Latvia	96%	99%	100%	92%	88%	91%
Lithuania	99%	100%	100%	92%	91%	92%
Macao SAR	100%	100%	100%	94%	94%	94%
Montenegro	100%	100%	100%	95%	95%	95%
Morocco	99%	99%	100%	98%	98%	98%
[†] Netherlands	54%	81%	100%	95%	51%	77%
[†] New Zealand	63%	88%	100%	89%	56%	78%
North Macedonia	99%	99%	100%	93%	92%	92%
Norway (5)	95%	96%	100%	92%	87%	88%
Oman	99%	100%	100%	97%	96%	97%
Poland	97%	100%	100%	89%	87%	89%
Portugal	97%	100%	100%	97%	93%	96%
Qatar	100%	100%	100%	96%	96%	96%
[≡] Romania	69%	71%	98%	87%	59%	60%
Saudi Arabia	97%	100%	100%	98%	95%	98%
Serbia	99%	99%	100%	94%	92%	93%
Singapore	100%	100%	100%	95%	95%	95%
Slovak Republic	99%	100%	100%	96%	95%	96%
Slovenia	96%	99%	99%	92%	88%	91%
South Africa (5)	96%	96%	100%	87%	83%	83%
Spain	100%	100%	100%	93%	92%	92%
Sweden	100%	100%	100%	95%	94%	95%
Türkiye (5)	77%	100%	100%	98%	76%	98%
United Arab Emirates	98%	98%	100%	96%	94%	94%
[†] United States	63%	82%	99%	93%	58%	76%
Uzbekistan	100%	100%	100%	99%	99%	99%
Benchmarking Participants						
Ontario, Canada	95%	95%	100%	95%	90%	90%
Quebec, Canada	79%	85%	99%	96%	75%	81%
Abu Dhabi, UAE	97%	97%	100%	97%	93%	93%
Dubai, UAE	99%	99%	100%	95%	95%	95%
Sharjah, UAE	99%	99%	100%	95%	94%	94%

TIMSS guidelines for sampling participation: The minimum acceptable participation rates were 85 percent of schools, 95 percent of classes, and 85 percent of students, or a combined rate (the product of school, class, and student participation) of 75 percent.

Participants not meeting these guidelines were annotated as follows:

[†] Met guidelines for sample participation rates only after replacement schools were included

[‡] Nearly satisfied guidelines for sample participation rates after replacement schools were included

[≡] Did not satisfy guidelines for sample participation rates

Exhibit B.6: Trends in Student Populations

Country	Years of Formal Schooling*	Average Age at Time of Testing	Overall Exclusion Rates	Overall Participation Rates (After Replacement)
Albania				
² 2023	4	10.1	8.2%	48%
2019	4	10.0	4.2%	98%
Armenia				
² 2023	4	9.9	6.1%	95%
2019	4	9.9	1.2%	97%
2015	4	9.9	1.0%	96%
2011	4	10.0	2.0%	98%
2003	4	10.9	2.9%	90%
Australia				
2023	4	10.1	3.7%	90%
2019	4	10.1	4.8%	94%
2015	4	10.0	4.2%	94%
2011	4	10.0	4.4%	93%
2007	4	9.9	4.0%	95%
[†] 2003	4	9.9	2.7%	85%
[≡] 1995	4	9.9	1.8%	66%
Azerbaijan				
2023	4	10.0	2.9%	92%
2019	4	10.3	2.6%	92%
² 2011	4	10.2	7.2%	100%
Bahrain				
2023	4	10.0	1.1%	98%
2019	4	9.8	0.8%	98%
² 2015	4	9.9	5.6%	99%
2011	4	10.4	1.1%	90%
Belgium (Flemish)				
² [†] 2023	4	10.0	5.7%	84%
[†] 2019	4	10.0	3.0%	89%
[†] 2015	4	10.1	1.4%	95%
2011	4	10.0	5.0%	92%
² 2003	4	10.0	6.3%	97%
Bulgaria				
2023	4	10.7	3.7%	94%
2019	4	10.7	3.4%	95%
2015	4	10.8	2.9%	93%
Canada				
¹ ³ 2023	4	9.9	14.3%	81%
¹ ² 2019	4	9.9	7.0%	86%
¹ ² [†] 2015	4	9.9	6.1%	80%
Chile				
² [†] 2023	4	10.2	5.6%	89%
2019	4	10.1	3.8%	95%
2015	4	10.2	3.7%	88%
2011	4	10.1	3.7%	95%
Chinese Taipei				
2023	4	10.3	2.6%	95%
2019	4	10.2	2.0%	98%
2015	4	10.2	2.4%	99%
2011	4	10.2	1.4%	99%
2007	4	10.2	2.8%	100%
2003	4	10.2	3.1%	99%
Cyprus				
² 2023	4	9.9	7.0%	95%
2019	4	9.8	4.6%	97%
2015	4	9.8	4.6%	98%
2003	4	9.9	2.9%	97%
1995	4	9.8	3.2%	83%
Czech Republic				
² 2023	4	10.4	7.3%	96%
2019	4	10.4	4.7%	96%
2015	4	10.4	4.2%	95%
2011	4	10.4	5.1%	94%
2007	4	10.3	4.9%	92%
1995	4	10.4	4.1%	86%
Denmark				
[†] 2023	4	10.9	5.2%	91%
[†] 2019	4	10.9	3.1%	83%
² [†] 2015	4	10.9	7.5%	86%
² 2011	4	11.0	6.3%	87%
[†] 2007	4	11.0	4.1%	85%

* Represents years of schooling counting from the first year of ISCED Level 1.

Trend data are included only for assessment years reported in TIMSS 2023.

See Appendix B.2 for population coverage notes 1, 2, and 3. See Appendix B.5 for sampling guidelines and sampling participation notes †, ‡, and ≡.

Exhibit B.7: Coverage of TIMSS 2023 Target Population

Country	International Target Population		Exclusions from National Target Population		
	Coverage	Notes on Coverage	School-Level Exclusions	Within-Sample Exclusions	Overall Exclusions
Australia	100%		2.0%	2.4%	4.4%
² Austria	100%		2.1%	5.0%	7.1%
Azerbaijan	100%		1.9%	0.3%	2.1%
Bahrain	100%		0.2%	0.7%	1.0%
Brazil	100%		2.4%	1.9%	4.3%
Chile	100%		0.3%	2.8%	3.2%
Chinese Taipei	100%		0.3%	2.0%	2.3%
Cote d'Ivoire	100%		1.3%	0.0%	1.3%
Cyprus	100%		0.9%	1.7%	2.6%
² Czech Republic	100%		3.0%	4.1%	7.1%
² England	100%		3.2%	4.0%	7.2%
Finland	100%		1.3%	1.0%	2.4%
France	100%		3.0%	2.2%	5.2%
¹ Georgia	93%	Students taught in Georgian	2.0%	1.9%	3.9%
Hong Kong SAR	100%		1.2%	0.1%	1.3%
Hungary	100%		2.4%	1.7%	4.0%
Iran, Islamic Rep. of	100%		0.1%	0.0%	0.2%
Ireland	100%		0.0%	2.7%	2.8%
³ Israel	100%		20.6%	5.3%	26.0%
Italy	100%		0.8%	4.4%	5.2%
Japan	100%		1.0%	2.2%	3.1%
Jordan	100%		0.0%	0.3%	0.3%
Kazakhstan	100%		2.2%	3.2%	5.4%
Korea, Rep. of	100%		1.7%	1.4%	3.1%
Kuwait	100%		0.8%	0.4%	1.2%
² Lithuania	100%		2.8%	6.2%	9.0%
Malaysia	100%		4.5%	0.2%	4.8%
Malta	100%		1.4%	2.0%	3.4%
Morocco	100%		0.2%	0.0%	0.2%
New Zealand	100%		2.6%	2.2%	4.9%
² Norway (9)	100%		1.9%	4.7%	6.5%
Oman	100%		1.1%	0.3%	1.4%
Palestinian Nat'l Auth.	100%		0.3%	0.5%	0.8%
Portugal	100%		1.1%	2.5%	3.6%
Qatar	100%		1.9%	0.9%	2.8%
Romania	100%		3.8%	1.2%	4.9%
² Saudi Arabia	100%		7.8%	0.8%	8.6%
³ Singapore	100%		12.6%	0.0%	12.6%
South Africa (9)	100%		0.2%	0.3%	0.5%
² Sweden	100%		1.6%	4.8%	6.4%
³ Türkiye	100%		1.0%	19.0%	20.0%
United Arab Emirates	100%		0.6%	1.1%	1.7%
United States	100%		0.0%	3.8%	3.8%
Uzbekistan	100%		4.2%	0.9%	5.1%
Benchmarking Participants					
Abu Dhabi, UAE	100%		0.8%	1.7%	2.5%
Dubai, UAE	100%		1.0%	0.6%	1.7%
Sharjah, UAE	100%		0.1%	0.8%	0.9%

¹ National Target Population does not include all of the International Target Population.

² National Defined Population covers 90% to 95% of National Target Population.

³ National Defined Population covers less than 90% of National Target Population (but at least 74%).

SOURCE: IEA's Trends in International Mathematics and Science Study - TIMSS 2023
Downloaded from <https://timss2023.org/results>

Exhibit B.8: School Sample Sizes

Country	Number of Schools in Original Sample	Number of Eligible Schools in Original Sample	Number of Schools in Original Sample that Participated	Number of Replacement Schools that Participated	Total Number of Schools that Participated
Australia	292	291	273	3	276
Austria	162	158	157	0	157
Azerbaijan	198	197	186	11	197
Bahrain	117	117	117	0	117
Brazil	894	865	802	47	849
Chile	178	177	136	32	168
Chinese Taipei	186	186	180	4	184
Cote d'Ivoire	154	154	152	2	154
Cyprus	99	99	96	0	96
Czech Republic	210	210	209	1	210
England	154	154	123	13	136
Finland	166	162	161	0	161
France	150	150	149	1	150
Georgia	156	156	150	6	156
Hong Kong SAR	156	155	114	21	135
Hungary	158	157	156	1	157
Iran, Islamic Rep. of	224	224	224	0	224
Ireland	154	154	151	2	153
Israel	195	195	190	5	195
Italy	152	152	146	6	152
Japan	150	150	118	15	133
Jordan	225	225	225	0	225
Kazakhstan	188	187	184	3	187
Korea, Rep. of	176	176	140	36	176
Kuwait	156	152	146	0	146
Lithuania	205	204	203	1	204
Malaysia	180	180	178	2	180
Malta	42	42	42	0	42
Morocco	256	256	250	0	250
New Zealand	152	152	65	33	98
Norway (9)	162	161	157	0	157
Oman	225	225	225	0	225
Palestinian Nat'l Auth.	200	200	197	1	198
Portugal	164	164	149	15	164
Qatar	191	191	191	0	191
Romania	195	190	122	6	128
Saudi Arabia	208	207	203	4	207
Singapore	145	145	145	0	145
South Africa (9)	300	290	277	4	281
Sweden	157	155	154	0	154
Türkiye	166	141	94	47	141
United Arab Emirates	762	758	750	0	750
United States	300	292	163	48	211
Uzbekistan	166	166	166	0	166
Benchmarking Participants					
Abu Dhabi, UAE	305	305	299	0	299
Dubai, UAE	176	175	174	0	174
Sharjah, UAE	149	147	147	0	147

SOURCE: IEA's Trends in International Mathematics and Science Study - TIMSS 2023
Downloaded from <https://timss2023.org/results>

Exhibit B.9: Student Sample Sizes

Country	Within-School Student Participation (Weighted Percentage)	Number of Students Sampled in Participating Schools	Number of Students Withdrawn from Class/School	Number of Students Excluded	Number of Students Eligible	Number of Students Absent	Number of Students Assessed
Australia	84%	10,292	158	149	9,985	1,543	8,442
Austria	96%	5,040	23	196	4,821	182	4,639
Azerbaijan	93%	6,769	110	12	6,647	473	6,174
Bahrain	97%	5,453	94	56	5,303	135	5,168
Brazil	93%	27,030	1,901	493	24,636	1,866	22,770
Chile	88%	5,405	190	108	5,107	629	4,478
Chinese Taipei	96%	5,983	112	92	5,779	236	5,543
Cote d'Ivoire	96%	8,869	268	0	8,601	317	8,284
Cyprus	94%	4,587	21	87	4,479	279	4,200
Czech Republic	95%	8,839	39	320	8,480	370	8,110
England	94%	4,914	264	135	4,515	276	4,239
Finland	94%	6,297	23	18	6,256	376	5,880
France	95%	4,920	85	100	4,735	224	4,511
Georgia	97%	5,175	44	92	5,039	167	4,872
Hong Kong SAR	90%	4,985	33	1	4,951	488	4,463
Hungary	96%	5,774	27	67	5,680	254	5,426
Iran, Islamic Rep. of	97%	6,567	147	4	6,416	190	6,226
Ireland	84%	6,234	51	143	6,040	950	5,090
Israel	90%	5,959	45	132	5,782	584	5,198
Italy	97%	4,975	20	219	4,736	145	4,591
Japan	88%	4,467	7	27	4,433	528	3,905
Jordan	98%	7,571	442	28	7,101	139	6,962
Kazakhstan	97%	6,643	45	54	6,544	182	6,362
Korea, Rep. of	95%	4,586	50	64	4,472	215	4,257
Kuwait	97%	4,529	58	0	4,471	139	4,332
Lithuania	92%	6,252	16	309	5,927	506	5,421
Malaysia	97%	9,333	257	1	9,075	295	8,780
Malta	93%	4,386	7	62	4,317	323	3,994
Morocco	96%	9,315	198	0	9,117	372	8,745
New Zealand	83%	4,781	40	51	4,690	760	3,930
Norway (9)	86%	7,869	95	419	7,355	1,031	6,324
Oman	97%	8,647	74	29	8,544	318	8,226
Palestinian Nat'l Auth.	98%	6,784	73	28	6,683	151	6,532
Portugal	96%	5,869	65	150	5,654	240	5,414
Qatar	95%	4,605	73	32	4,500	202	4,298
Romania	87%	4,267	19	7	4,241	519	3,722
Saudi Arabia	98%	6,027	15	22	5,990	108	5,882
Singapore	95%	5,032	8	1	5,023	251	4,772
South Africa (9)	91%	13,263	4	11	13,248	1,308	11,940
Sweden	91%	5,900	48	246	5,606	524	5,082
Türkiye	97%	5,390	151	154	5,085	160	4,925
United Arab Emirates	96%	34,759	215	435	34,109	1,369	32,740
United States	90%	9,521	195	324	9,002	928	8,074
Uzbekistan	99%	4,409	21	9	4,379	40	4,339
Benchmarking Participants							
Abu Dhabi, UAE	96%	12,881	69	222	12,590	481	12,109
Dubai, UAE	95%	8,792	109	77	8,606	442	8,164
Sharjah, UAE	96%	6,734	24	66	6,644	259	6,385

Students attending a sampled class at the time the sample was chosen but leaving the class before the assessment was administered were classified as "withdrawn."

Students with a disability or language barrier that prevented them from participating in the assessment were classified as "excluded."

Students not present when the assessment was administered, and not subsequently assessed in a make-up session, were classified as "absent."

SOURCE: IEA's Trends in International Mathematics and Science Study - TIMSS 2023
Downloaded from <https://timss2023.org/results>

Exhibit B.10: Participation Rates (Weighted)

Country	School Participation		Class Participation	Student Participation	Overall Participation	
	Before Replacement	After Replacement			Before Replacement	After Replacement
Australia	95%	96%	99%	84%	79%	80%
Austria	99%	99%	100%	96%	95%	95%
Azerbaijan	95%	100%	100%	93%	88%	93%
Bahrain	100%	100%	100%	97%	97%	97%
Brazil	88%	98%	100%	93%	81%	91%
† Chile	78%	96%	100%	88%	69%	84%
Chinese Taipei	97%	99%	100%	96%	93%	95%
Cote d'Ivoire	99%	100%	100%	96%	95%	96%
Cyprus	97%	97%	99%	94%	91%	91%
Czech Republic	100%	100%	100%	95%	95%	95%
England	81%	88%	100%	94%	76%	83%
Finland	99%	99%	100%	94%	93%	93%
France	99%	100%	100%	95%	94%	95%
Georgia	97%	100%	100%	97%	94%	97%
† Hong Kong SAR	73%	87%	99%	90%	64%	77%
Hungary	100%	100%	100%	96%	95%	96%
Iran, Islamic Rep. of	100%	100%	100%	97%	97%	97%
Ireland	98%	99%	100%	84%	82%	84%
Israel	97%	100%	100%	90%	87%	90%
Italy	96%	100%	100%	97%	93%	97%
† Japan	79%	89%	100%	88%	70%	78%
Jordan	100%	100%	100%	98%	98%	98%
Kazakhstan	98%	100%	100%	97%	95%	97%
Korea, Rep. of	80%	100%	100%	95%	76%	95%
Kuwait	96%	96%	100%	97%	93%	93%
Lithuania	100%	100%	100%	92%	91%	91%
Malaysia	100%	100%	100%	97%	96%	97%
Malta	100%	100%	100%	93%	93%	93%
Morocco	97%	97%	100%	96%	93%	93%
≡ New Zealand	41%	65%	98%	83%	34%	53%
Norway (9)	98%	98%	100%	86%	84%	84%
Oman	100%	100%	100%	97%	97%	97%
Palestinian Nat'l Auth.	98%	99%	100%	98%	96%	97%
Portugal	91%	100%	100%	96%	87%	95%
Qatar	100%	100%	100%	95%	95%	95%
≡ Romania	65%	68%	98%	87%	56%	58%
Saudi Arabia	98%	100%	100%	98%	96%	98%
Singapore	100%	100%	100%	95%	95%	95%
South Africa (9)	96%	96%	100%	91%	87%	87%
Sweden	99%	99%	100%	91%	90%	90%
† Türkiye	66%	100%	100%	97%	64%	97%
United Arab Emirates	99%	99%	100%	96%	95%	95%
≡ United States	55%	72%	97%	90%	48%	63%
Uzbekistan	100%	100%	100%	99%	99%	99%
Benchmarking Participants						
Abu Dhabi, UAE	98%	98%	100%	96%	94%	94%
Dubai, UAE	99%	99%	100%	95%	95%	95%
Sharjah, UAE	100%	100%	100%	96%	96%	96%

TIMSS guidelines for sampling participation: The minimum acceptable participation rates were 85 percent of schools, 95 percent of classes, and 85 percent of students, or a combined rate (the product of school, class, and student participation) of 75 percent.

Participants not meeting these guidelines were annotated as follows:

† Met guidelines for sample participation rates only after replacement schools were included

‡ Nearly satisfied guidelines for sample participation rates after replacement schools were included

≡ Did not satisfy guidelines for sample participation rates

SOURCE: IEA's Trends in International Mathematics and Science Study - TIMSS 2023
Downloaded from <https://timss2023.org/results>

Exhibit B.11: Trends in Student Populations

Country	Years of Formal Schooling*	Average Age at Time of Testing	Overall Exclusion Rates	Overall Participation Rates (After Replacement)
Australia				
2023	8	14.1	4.4%	80%
2019	8	14.1	3.8%	91%
2015	8	14.0	3.5%	90%
2011	8	14.0	3.2%	88%
2007	8	13.9	1.9%	93%
2003	8	13.9	1.3%	83%
† 1995	8	13.9	0.8%	70%
Bahrain				
2023	8	13.9	1.0%	97%
2019	8	13.8	0.6%	97%
2015	8	14.0	3.8%	97%
2011	8	14.4	1.6%	97%
2007	8	14.1	1.5%	97%
2003	8	14.1	0.0%	98%
Chile				
† 2023	8	14.2	3.2%	84%
2019	8	14.2	2.2%	95%
2015	8	14.3	1.9%	85%
2011	8	14.2	2.8%	95%
2003	8	14.2	2.2%	99%
1999	8	14.4	2.8%	96%
Chinese Taipei				
2023	8	14.2	2.3%	95%
2019	8	14.3	1.5%	97%
2015	8	14.3	1.7%	98%
2011	8	14.2	1.3%	99%
2007	8	14.2	3.3%	99%
2003	8	14.2	4.8%	99%
1999	8	14.2	1.6%	99%
Cyprus				
2023	8	13.8	2.6%	91%
2019	8	13.8	2.8%	96%
2007	8	13.8	2.5%	96%
2003	8	13.8	2.5%	96%
1999	8	13.8	0.8%	97%
1995	8	13.7	0.0%	97%
Czech Republic				
² 2023	8	14.3	7.1%	95%
2007	8	14.4	4.6%	95%
1999	8	14.4	5.2%	96%
1995	8	14.4	4.9%	92%
England				
² 2023	9	14.0	7.2%	83%
2019	9	14.0	4.8%	85%
2015	9	14.1	2.3%	92%
‡ 2011	9	14.2	2.2%	70%
† 2007	9	14.2	2.3%	75%
≡ 2003	9	14.3	2.1%	46%
† 1999	9	14.2	5.0%	77%
³ † 1995	9	14.0	11.3%	77%
Finland				
2023	8	14.9	2.4%	93%
2019	8	14.8	3.1%	95%
2011	8	14.8	3.4%	93%
France				
2023	8	13.9	5.2%	95%
2019	8	13.9	3.8%	97%
1995	8	14.3	2.0%	82%
Georgia				
¹ 2023	8	14.1	3.9%	97%
¹ 2019	8	13.8	4.3%	89%
^{1,2} 2015	8	13.7	6.0%	98%
¹ 2011	8	14.2	4.5%	97%
¹ 2007	8	14.2	3.9%	97%
Hong Kong SAR				
† 2023	8	14.2	1.3%	77%
† 2019	8	14.1	3.3%	81%
2015	8	14.2	1.6%	81%
2011	8	14.2	5.3%	75%
† 2007	8	14.4	3.8%	75%
† 2003	8	14.4	3.4%	80%
† 1999	8	14.2	0.8%	74%
1995	8	14.2	2.0%	81%

* Represents years of schooling counting from the first year of ISCED Level 1.
Trend data are included only for assessment years reported in TIMSS 2023.

See Appendix B.7 for population coverage notes 1, 2, and 3. See Appendix B.10 for sampling guidelines and sampling participation notes †, ‡, and ≡.

SOURCE: IEA's Trends in International Mathematics and Science Study - TIMSS 2023
Downloaded from <https://timss2023.org/results>

APPENDIX C: The TIMSS 2023 Test-Curriculum Matching Analysis

TIMSS is designed and implemented to ensure that comparisons of student achievement across countries are fair and equitable. The [TIMSS 2023 Assessment Frameworks](#) were developed to specify the important aspects of mathematics and science to be covered in an international assessment of student achievement based on input and with agreement from participating countries. The assessment items were developed through a collaborative process with national representatives to reflect the assessment specifications articulated in the frameworks, and all items were field-tested in participating countries. Finalizing the TIMSS 2023 assessments involved a series of reviews by representatives of the participating countries, subject matter experts in mathematics and science, and measurement specialists. Ultimately, the National Research Coordinators (NRCs) from each participating country formally approved the TIMSS 2023 assessments, confirming the assessments' fairness for comparing students' mathematics and science achievement internationally.

Although the assessments were developed to adhere to the agreed-upon frameworks and be as consistent as possible across countries, it may be argued that the alignment between the TIMSS 2023 assessments and countries' mathematics and science curricula varies across countries.

However, limiting the assessment items to only those topics covered uniformly in all participating countries would greatly limit the assessment coverage and restrict the research questions TIMSS is designed to address. The assessment aims to cover the TIMSS frameworks broadly and hence may include some items assessing topics that may be unfamiliar to some students in some countries.

A study referred to as Test-Curriculum Matching Analysis (TCMA) is conducted in each TIMSS cycle to investigate the extent to which the assessments align with the mathematics and science curricula of each participating country.¹ The TCMA also investigates how a country's average achievement would be affected if only the achievement items assessing topics covered by its own curriculum were included.

To gather this information, TIMSS 2023 NRCs were asked to review each achievement item in the TIMSS 2023 assessment and indicate whether the knowledge and skills assessed by the item were part of their country's intended curriculum for the relevant grade level (e.g., the fourth

¹ It should be noted that because there may be content areas covered by the curricula in some countries that are not covered by the TIMSS 2023 assessments, the TCMA may not provide complete information about how well the assessments cover the curricula of the countries.

or eighth grade). The NRCs were asked to involve experts or individuals who are familiar with the curriculum at these grades to make this determination.

In some countries, the curriculum prescribes topics for a range of grades rather than specifying what should be covered by the end of each grade. For example, in France the curriculum specifies the curricular goals to be achieved by the end of primary school Cycle 2 (Grades 1–3), Cycle 3 (Grades 4–6), and Cycle 4 (Grades 7–9), rather than providing grade-specific guidelines (see *TIMSS 2023 Encyclopedia*). In such situations, NRCs were asked to make the best judgment possible. If an item applied to only a subset of students within a country, NRCs were instructed to consider the item as part of the curriculum if it was included in the intended curriculum for more than 50% of the student population.

Match Between TIMSS Assessments and Countries' Mathematics and Science Curricula

Exhibits C.1 through C.4 present the TCMA results for the TIMSS 2023 mathematics and science assessments at the fourth and eighth grades, respectively. The bottom row of each exhibit shows the number of items, with the corresponding number of score points in parentheses, identified by each country as relevant to its students according to its curriculum. The TCMA was conducted based on all countries and benchmarking participants that administered the TIMSS 2023 digital assessment *and* provided the requested information. Therefore, not all participating countries are represented in the exhibits.

In mathematics at the fourth grade (Exhibit C.1), countries' average mathematics achievement was based on students' performance on 183 items. This represents the maximum number of items that a country could identify as part of its fourth-grade mathematics curriculum.² Overall, the proportion of mathematics items covered by countries' curricula was high. Reading along the bottom row, 9 of the 51 countries and 3 of the 5 benchmarking participants included in the analysis judged 100% of the items as relevant to their curricula. Additionally, 39 countries and 2 benchmarking participants found at least 75% of the items to be relevant. All participants at the fourth-grade level agreed that more than half of the mathematics items aligned with their curricula.

In fourth-grade science (Exhibit C.2), there were a maximum of 173 items. The distribution of curriculum alignment with the fourth-grade science assessment items varied widely across participating countries and benchmarking participants.

² Numbers of items and score points are based on the TIMSS 2023 fourth-grade mathematics items included in scaling. See Chapter 9 of [TIMSS 2023 Technical Report](#) for details about items deleted or recoded for scaling

Several high-performing countries, notably Singapore and Japan, selected relatively few science items as relevant for their fourth-grade students. Of the 38 countries and 5 benchmarking participants at the fourth grade, 6 countries and 3 benchmarking participants judged 100% of the science items to be addressed by their curricula. Additionally, 23 countries selected 75% or more of the science items, with percentages ranging from 77% to 98%.

At the eighth grade, the proportions of mathematics and science items identified as aligned with countries' curricula were generally higher compared to the fourth grade. In mathematics (Exhibit C.3), 7 of the 39 participating countries, along with all benchmarking participants, judged 100% of the mathematics items to assess topics covered by their curricula, totaling 200 items. All remaining countries considered 75% or more of the items to be relevant.

In eighth-grade science (Exhibit C.4), 4 of the 39 countries and all benchmarking participants judged 100% of the 212 science items to be aligned with their curricula. An additional 24 countries selected 75% or more of the science items. Notably, all but 2 countries agreed that over half of the science items assessed topics covered by their curricula at the eighth grade.

Impact of Item Selection on Average Scale Scores

The first columns in Exhibits C.1 through C.4 show, for each grade and subject, the average scale score and its standard error for each country, based on all assessment items, as reported in Exhibits 1.1.1, 1.2.1, 2.1.1, and 2.2.1 of this report. Countries are listed in descending order according to their overall average achievement scores. The subsequent columns show the average performance of each country based solely on the items selected by the participant named at the top of the column. To interpret these results, choosing a country from the top of the exhibit and reading down its column indicates the average scale score and standard error for the country in each row, but estimated based only on the set of items identified by the country at the top of the column. This allows for a comparison of how each country performed when assessed by the items selected as suitable for another country's students. Standard errors provide a margin of error for comparing average scale scores across countries. Differences in one country's average scale scores across exhibit columns should be interpreted with caution.

For example, in Exhibit C.1, the column for Singapore shows that Singapore had an average fourth-grade mathematics scale score of 619 based on the items it selected as part of its curriculum. Looking further down the column, Chinese Taipei had an average scale score of 608 based on Singapore's selected items, while Korea had 595 on that same set of items. This pattern continues for all other countries in the row, showing the

estimated average achievement for each country based solely on the specific set of items deemed suitable by Singapore.

The shaded diagonal element in these exhibits shows the average achievement of each country based solely on the set of items that it selected based on its own curriculum. Generally, countries' achievement was slightly higher when estimated based on their own item sets compared to the assessment overall, though the differences were typically small. Comparing the diagonal element for a country with the overall average scale score shows the difference between achievement estimated based on the set of items selected for that country and achievement based on all assessment items. To illustrate, Singapore's average scale score based on all fourth-grade mathematics items was 615, as shown in the first column. Singapore's diagonal element in Exhibit C.1 (619) shows that students from Singapore had just slightly higher achievement (a 4-point difference) based on their selected set of items than they did based on all items. In fourth-grade mathematics, most participants had a difference of no more than 1 or 2 scale score points between the two estimates. The largest differences occurred in Australia (9 points) and Japan (8 points).

In comparison to fourth-grade mathematics, the differences between countries' average achievement based on their chosen set of items and achievement based on all items were more pronounced in science (Exhibit C.2). While over half of the participants had a difference of 3 scale score points or less, the largest discrepancy was observed in Singapore, with a 74-point difference, followed by Japan and Korea with differences of 30 points and 22 points, respectively. Notably, Singapore and Japan selected the smallest proportions of science test items as relevant for their students among the 51 countries and 5 benchmarking participants included in the analysis.

At the eighth grade, the differences between countries' average scale scores based on all items and those based on their selected subsets were generally smaller. In mathematics (Exhibit C.3), 27 out of 39 countries and all 3 benchmarking participants showed differences of 1 scale score point or less. Morocco had the largest difference in average mathematics achievement between the estimate based on its selected items and the estimate based on all items (8 points). The eighth-grade science results (Exhibit C.4) were similar, with 19 countries and all benchmarking participants showing a maximum difference of 1 scale score point. Japan had the largest difference in science achievement, with a 19-point gap, followed by Cyprus, Korea, and Singapore, which had differences ranging from 11 to 15 points.

The TCMA results indicate that, in most cases, the selection of items does not greatly affect the relative performance of countries. Countries that demonstrated relatively high or low achievement in mathematics or science based on the full set of items maintained similar rankings of achievement estimated based on the various item sets selected for the TCMA. Although there were some changes in the ordering of countries

based on the items selected for the TCMA, most of these differences were within the margins of sampling error. Small differences in average scale scores between adjacent countries shown in the exhibits usually are not statistically significant at the chosen alpha level.

Even when countries had higher achievement estimates based on the items they identified as aligned with their curricula than they did based on all items, their average achievement relative to other participants showed minimal change. For instance, in eighth-grade science, Korea selected 124 items (Exhibit C.4) and had higher average achievement estimates based on these items, with an average scale score of 558 compared to 545 based on the overall assessment.

However, most other countries also had higher achievement based on this subset of items selected by Korea. Singapore and Japan, for example, also had higher achievement based on Korea's selected items compared with their average achievement based on all items.

The TCMA results provide evidence that the TIMSS 2023 assessments provide a robust foundation for comparing the achievement of participating countries and benchmarking entities. This outcome is expected, as ensuring the fairness of the assessments is fundamental to the TIMSS methods and procedures for test development and reporting. Moreover, most countries reported that the majority of items were relevant to the curricula for their students, suggesting that overall, there was a good alignment between the assessment content and the knowledge and skills addressed by curricula across participating countries. When countries excluded items deemed not relevant for their students due to difficulty, these items were often challenging for students in other countries as well. The analysis shows that while excluding such items may improve a country's average results, it also tends to improve the results for other countries, leaving the overall pattern of relative performance largely unchanged.

Exhibit C.1: Average Scale Scores for the Mathematics Test-Curriculum Matching Analysis

Results based on items identified by each country as addressed in its curriculum

Read down the column under a country name to compare achievement scores based on the items identified by that country. Scores on the diagonal are countries' achievement scores based on the test items they identified.

Country	Average Mathematics Scale Score based on All Items	Singapore	Chinese Taipei	Hong Kong SAR	Korea, Rep. of	Japan	Macao SAR	Lithuania	Türkiye (5)	England	Ireland
Singapore	615 (2.9)	619 (2.9)	615 (2.9)	615 (3.0)	618 (2.9)	614 (2.9)	615 (2.9)	612 (2.9)	616 (2.9)	615 (2.9)	615 (2.9)
Chinese Taipei	607 (1.7)	608 (1.7)	607 (1.8)	609 (1.8)	610 (1.8)	613 (1.7)	607 (1.8)	606 (1.7)	608 (1.8)	607 (1.7)	607 (1.7)
Hong Kong SAR	594 (4.0)	594 (4.1)	595 (4.1)	599 (4.1)	596 (3.9)	593 (4.0)	594 (4.1)	593 (4.0)	595 (4.2)	594 (4.0)	595 (4.0)
Korea, Rep. of	594 (2.6)	595 (2.6)	594 (2.6)	595 (2.6)	600 (2.7)	597 (2.6)	595 (2.6)	595 (2.6)	594 (2.7)	594 (2.6)	596 (2.7)
Japan	591 (2.3)	590 (2.3)	590 (2.3)	588 (2.4)	594 (2.3)	599 (2.4)	589 (2.4)	592 (2.3)	589 (2.4)	590 (2.3)	590 (2.3)
Macao SAR	582 (1.0)	581 (1.1)	582 (1.1)	584 (1.1)	586 (1.1)	582 (1.1)	582 (1.1)	582 (1.1)	582 (1.0)	582 (1.0)	583 (1.0)
Lithuania	561 (2.9)	561 (2.9)	562 (3.0)	563 (2.9)	563 (2.9)	565 (2.9)	562 (2.9)	565 (2.9)	561 (3.0)	561 (2.9)	561 (2.9)
Türkiye (5)	553 (4.1)	555 (4.2)	554 (4.1)	555 (4.1)	554 (4.0)	554 (4.1)	553 (4.1)	553 (4.0)	554 (4.2)	554 (4.1)	553 (4.1)
England	552 (2.7)	554 (2.7)	552 (2.7)	553 (2.8)	551 (2.7)	550 (2.7)	552 (2.8)	551 (2.7)	552 (2.7)	552 (2.7)	553 (2.7)
Ireland	546 (2.9)	548 (3.0)	546 (2.9)	548 (3.0)	546 (2.9)	548 (3.0)	548 (3.0)	545 (2.9)	547 (3.0)	546 (2.9)	546 (2.9)
Poland	546 (2.0)	546 (2.1)	546 (2.1)	548 (2.0)	547 (2.1)	548 (2.1)	549 (2.0)	547 (2.0)	548 (2.1)	546 (2.1)	546 (2.0)
Romania	542 (4.8)	541 (4.9)	542 (4.8)	544 (4.9)	544 (4.9)	543 (4.9)	544 (4.9)	543 (4.8)	543 (4.8)	542 (4.8)	541 (4.8)
Netherlands	537 (2.0)	538 (2.0)	537 (2.0)	537 (2.0)	538 (2.0)	540 (2.0)	538 (1.9)	540 (2.0)	538 (2.0)	537 (2.0)	537 (2.0)
Latvia	534 (2.8)	534 (2.9)	534 (2.8)	535 (2.8)	538 (2.9)	537 (2.9)	535 (2.9)	536 (2.8)	535 (2.9)	534 (2.8)	535 (2.8)
Norway (5)	531 (2.0)	530 (2.0)	531 (2.0)	530 (2.0)	530 (2.1)	530 (2.0)	530 (2.0)	532 (2.0)	530 (2.0)	531 (2.0)	530 (2.0)
Czech Republic	530 (2.2)	531 (2.2)	531 (2.2)	531 (2.2)	530 (2.2)	532 (2.2)	532 (2.2)	530 (2.2)	531 (2.2)	531 (2.2)	530 (2.2)
Sweden	530 (2.8)	529 (2.8)	530 (2.8)	528 (2.8)	529 (2.8)	529 (2.8)	529 (2.9)	531 (2.8)	529 (2.8)	530 (2.8)	530 (2.8)
Finland	529 (2.5)	529 (2.5)	529 (2.5)	528 (2.5)	528 (2.5)	531 (2.5)	529 (2.5)	530 (2.5)	529 (2.5)	529 (2.5)	529 (2.5)
Australia	525 (2.6)	526 (2.6)	525 (2.6)	526 (2.6)	524 (2.6)	523 (2.6)	525 (2.6)	526 (2.6)	525 (2.6)	525 (2.6)	525 (2.6)
Denmark	524 (2.1)	524 (2.1)	523 (2.1)	520 (2.1)	524 (2.1)	524 (2.1)	522 (2.1)	525 (2.1)	523 (2.1)	524 (2.1)	524 (2.1)
Germany	524 (2.1)	524 (2.2)	524 (2.2)	525 (2.2)	523 (2.2)	525 (2.2)	525 (2.2)	523 (2.1)	526 (2.2)	524 (2.2)	524 (2.1)
Serbia	523 (3.3)	522 (3.3)	524 (3.3)	525 (3.2)	525 (3.4)	525 (3.4)	525 (3.3)	523 (3.3)	524 (3.3)	523 (3.3)	523 (3.3)
Belgium (Flemish)	521 (2.4)	522 (2.4)	521 (2.4)	520 (2.4)	522 (2.4)	523 (2.4)	522 (2.5)	519 (2.4)	522 (2.5)	520 (2.4)	521 (2.4)
Hungary	520 (3.6)	520 (3.7)	521 (3.6)	521 (3.6)	520 (3.7)	519 (3.8)	521 (3.7)	521 (3.6)	521 (3.6)	520 (3.6)	520 (3.6)
Portugal	517 (2.8)	519 (2.8)	518 (2.8)	519 (2.8)	518 (2.9)	516 (2.9)	518 (2.8)	517 (2.8)	518 (2.8)	518 (2.8)	517 (2.8)
United States	517 (3.1)	517 (3.1)	517 (3.1)	518 (3.1)	517 (3.1)	517 (3.1)	519 (3.1)	516 (3.1)	518 (3.1)	517 (3.1)	517 (3.1)
Slovak Republic	515 (3.1)	514 (3.1)	515 (3.1)	516 (3.1)	513 (3.2)	514 (3.2)	515 (3.1)	515 (3.1)	515 (3.1)	515 (3.1)	515 (3.1)
Slovenia	514 (1.8)	514 (1.9)	514 (1.8)	515 (1.9)	514 (1.9)	513 (1.9)	516 (1.9)	513 (1.8)	515 (1.9)	514 (1.8)	513 (1.8)
Armenia	513 (2.8)	510 (2.8)	513 (2.8)	515 (2.8)	511 (2.9)	512 (2.8)	513 (2.8)	511 (2.8)	513 (2.8)	512 (2.8)	512 (2.8)
Italy	513 (2.8)	514 (2.8)	514 (2.8)	515 (2.8)	515 (2.8)	515 (2.9)	515 (2.8)	513 (2.8)	515 (2.8)	513 (2.8)	513 (2.8)
Albania	512 (4.9)	511 (5.1)	512 (4.9)	514 (5.0)	510 (5.1)	510 (5.1)	512 (5.0)	510 (4.9)	512 (5.0)	511 (5.0)	511 (4.9)
Canada	504 (2.0)	504 (2.0)	504 (2.0)	504 (2.0)	503 (2.0)	503 (2.0)	503 (2.0)	504 (2.0)	503 (2.0)	504 (2.0)	504 (2.0)
Georgia	498 (3.1)	496 (3.1)	498 (3.1)	501 (3.1)	499 (3.0)	499 (3.1)	500 (3.1)	498 (3.0)	499 (3.1)	497 (3.1)	498 (3.0)
Spain	498 (2.1)	500 (2.1)	498 (2.1)	499 (2.1)	501 (2.1)	499 (2.1)	499 (2.1)	499 (2.1)	498 (2.1)	499 (2.1)	498 (2.1)
United Arab Emirates	498 (1.2)	498 (1.3)	498 (1.3)	499 (1.2)	498 (1.3)	497 (1.3)	498 (1.2)	497 (1.2)	498 (1.2)	498 (1.2)	498 (1.2)
New Zealand	490 (2.6)	491 (2.7)	490 (2.7)	490 (2.7)	489 (2.7)	490 (2.7)	491 (2.7)	491 (2.7)	490 (2.7)	490 (2.6)	490 (2.7)
Belgium (French)	489 (2.4)	489 (2.5)	489 (2.4)	488 (2.4)	490 (2.5)	490 (2.5)	488 (2.4)	488 (2.4)	489 (2.5)	490 (2.4)	490 (2.4)
Kazakhstan	487 (3.6)	484 (3.7)	487 (3.6)	489 (3.6)	492 (3.7)	489 (3.7)	489 (3.6)	489 (3.6)	486 (3.6)	486 (3.6)	487 (3.6)
France	484 (2.9)	484 (2.9)	484 (2.9)	484 (2.9)	486 (3.0)	485 (3.0)	484 (2.9)	484 (2.9)	485 (2.9)	484 (2.9)	484 (2.9)
Montenegro	477 (2.1)	475 (2.1)	477 (2.1)	480 (2.1)	480 (2.1)	478 (2.2)	479 (2.1)	478 (2.1)	478 (2.1)	477 (2.1)	477 (2.1)
North Macedonia	474 (3.6)	472 (3.6)	474 (3.6)	475 (3.6)	472 (3.6)	472 (3.7)	473 (3.6)	473 (3.6)	474 (3.6)	473 (3.6)	473 (3.6)
Qatar	464 (3.5)	464 (3.5)	464 (3.5)	464 (3.5)	464 (3.5)	463 (3.5)	464 (3.5)	463 (3.5)	463 (3.5)	464 (3.5)	464 (3.5)
Bahrain	462 (4.1)	462 (4.2)	462 (4.2)	462 (4.2)	461 (4.2)	460 (4.2)	461 (4.2)	461 (4.1)	461 (4.2)	462 (4.2)	462 (4.2)
Kosovo	451 (3.4)	450 (3.4)	452 (3.5)	453 (3.5)	453 (3.4)	451 (3.5)	452 (3.5)	452 (3.4)	452 (3.4)	451 (3.5)	452 (3.5)
Bosnia & Herzegovina	447 (3.2)	446 (3.3)	448 (3.2)	450 (3.3)	449 (3.4)	449 (3.3)	449 (3.3)	448 (3.3)	449 (3.3)	447 (3.2)	447 (3.3)
Chile	444 (2.8)	443 (2.8)	443 (2.8)	442 (2.9)	445 (2.9)	442 (2.9)	441 (2.9)	446 (2.8)	442 (2.8)	443 (2.8)	444 (2.8)
Uzbekistan	443 (3.2)	442 (3.2)	444 (3.2)	447 (3.2)	447 (3.2)	445 (3.3)	446 (3.2)	443 (3.2)	445 (3.2)	443 (3.2)	444 (3.2)
Jordan	427 (5.3)	427 (5.3)	427 (5.3)	430 (5.3)	425 (5.3)	425 (5.4)	428 (5.2)	425 (5.3)	428 (5.2)	427 (5.3)	427 (5.3)
Oman	421 (4.0)	422 (4.0)	422 (4.0)	421 (4.1)	419 (4.1)	420 (4.1)	420 (4.0)	421 (4.0)	421 (4.0)	421 (4.0)	421 (4.0)
Saudi Arabia	420 (4.2)	419 (4.2)	419 (4.2)	421 (4.2)	418 (4.2)	419 (4.3)	419 (4.2)	419 (4.2)	419 (4.1)	419 (4.2)	419 (4.2)
Brazil	400 (3.4)	400 (3.5)	400 (3.4)	401 (3.4)	400 (3.5)	400 (3.4)	400 (3.5)	401 (3.4)	400 (3.4)	400 (3.4)	399 (3.4)
International Average	512 (0.4)	512 (0.4)	512 (0.4)	513 (0.4)	512 (0.4)	512 (0.4)	512 (0.4)	512 (0.4)	512 (0.4)	511 (0.4)	512 (0.4)
Benchmarking Participants											
Dubai, UAE	557 (1.6)	557 (1.6)	557 (1.6)	557 (1.6)	556 (1.6)	555 (1.6)	556 (1.6)	556 (1.6)	556 (1.6)	557 (1.6)	557 (1.6)
Quebec, Canada	515 (2.7)	516 (2.8)	515 (2.7)	514 (2.7)	515 (2.8)	515 (2.8)	513 (2.7)	514 (2.7)	514 (2.7)	515 (2.7)	515 (2.7)
Sharjah, UAE	504 (3.3)	504 (3.3)	504 (3.3)	505 (3.3)	503 (3.3)	503 (3.3)	503 (3.3)	503 (3.2)	504 (3.3)	504 (3.3)	504 (3.3)
Ontario, Canada	503 (3.4)	503 (3.4)	503 (3.4)	503 (3.4)	502 (3.5)	502 (3.4)	503 (3.4)	504 (3.4)	502 (3.3)	503 (3.4)	503 (3.4)
Abu Dhabi, UAE	459 (1.9)	458 (2.0)	459 (2.0)	460 (2.0)	459 (2.0)	458 (1.9)	459 (1.9)	458 (1.9)	458 (1.9)	458 (2.0)	458 (1.9)
Number of Items (Score Points)*	183 (192)	155 (164)	178 (187)	148 (154)	145 (154)	140 (147)	152 (159)	169 (177)	161 (168)	179 (188)	176 (183)

* The number of items and score points are based on the number of items included in scaling the fourth-grade mathematics achievement data.

See Chapter 9 in TIMSS 2023 Technical Report (Methods and Procedures) for information about items deleted or recoded for scaling.

(.) Standard errors appear in parentheses. Because of rounding some results may appear inconsistent.

SOURCE: IEA's Trends in International Mathematics and Science Study - TIMSS 2023
Downloaded from <https://timss2023.org/results>

Exhibit C.1: Average Scale Scores for the Mathematics Test-Curriculum Matching Analysis

Results based on items identified by each country as addressed in its curriculum

(Continued)

Country	Average Mathematics Scale Score based on All Items	Poland	Romania	Netherlands	Latvia	Norway (5)	Czech Republic	Sweden	Finland	Australia	Denmark
Singapore	615 (2.9)	614 (2.9)	615 (2.9)	615 (2.9)	614 (2.9)	615 (2.9)	612 (2.9)	612 (2.9)	614 (2.9)	613 (2.9)	615 (2.9)
Chinese Taipei	607 (1.7)	606 (1.7)	607 (1.7)	608 (1.8)	606 (1.8)	607 (1.8)	605 (1.8)	604 (1.8)	608 (1.8)	603 (1.8)	607 (1.7)
Hong Kong SAR	594 (4.0)	594 (4.0)	594 (4.0)	593 (4.0)	594 (4.1)	596 (4.0)	594 (4.0)	592 (4.0)	593 (4.0)	593 (4.1)	594 (4.0)
Korea, Rep. of	594 (2.6)	595 (2.6)	594 (2.6)	594 (2.6)	593 (2.7)	597 (2.7)	592 (2.7)	592 (2.7)	596 (2.6)	597 (2.6)	595 (2.6)
Japan	591 (2.3)	591 (2.3)	591 (2.3)	593 (2.3)	590 (2.4)	592 (2.4)	591 (2.3)	589 (2.4)	594 (2.3)	589 (2.3)	591 (2.3)
Macao SAR	582 (1.0)	582 (1.0)	582 (1.0)	581 (1.1)	581 (1.0)	582 (1.1)	581 (1.1)	580 (1.1)	582 (1.0)	582 (1.1)	581 (1.1)
Lithuania	561 (2.9)	562 (2.9)	561 (2.9)	565 (3.0)	561 (2.9)	564 (2.9)	562 (3.0)	562 (3.0)	562 (2.9)	560 (3.0)	559 (2.9)
Türkiye (5)	553 (4.1)	553 (4.1)	553 (4.1)	555 (4.1)	553 (4.1)	554 (4.1)	553 (4.1)	552 (4.1)	553 (4.0)	553 (4.1)	553 (4.1)
England	552 (2.7)	552 (2.7)	552 (2.7)	553 (2.6)	552 (2.8)	552 (2.8)	550 (2.7)	551 (2.7)	550 (2.7)	556 (2.7)	552 (2.7)
Ireland	546 (2.9)	545 (2.9)	546 (2.9)	547 (3.0)	546 (2.9)	547 (3.0)	544 (2.9)	545 (2.9)	546 (2.9)	549 (3.0)	545 (2.9)
Poland	546 (2.0)	547 (2.0)	546 (2.0)	547 (2.0)	546 (2.0)	548 (2.1)	547 (2.0)	547 (2.0)	547 (2.0)	551 (2.1)	546 (2.0)
Romania	542 (4.8)	542 (4.9)	542 (4.8)	540 (4.8)	542 (4.9)	543 (5.0)	543 (4.9)	543 (4.9)	542 (4.9)	541 (4.9)	541 (4.8)
Netherlands	537 (2.0)	538 (2.0)	537 (2.0)	543 (2.1)	537 (2.0)	539 (2.0)	539 (2.1)	540 (2.1)	539 (2.0)	540 (2.1)	538 (2.0)
Latvia	535 (2.8)	535 (2.8)	534 (2.8)	536 (2.9)	535 (2.8)	538 (3.0)	535 (2.9)	535 (2.9)	535 (2.8)	536 (2.9)	534 (2.8)
Norway (5)	531 (2.0)	531 (2.0)	531 (2.0)	532 (2.0)	531 (2.0)	533 (2.1)	531 (2.0)	532 (2.0)	531 (2.0)	536 (2.1)	531 (2.0)
Czech Republic	530 (2.2)	530 (2.2)	530 (2.2)	530 (2.2)	531 (2.2)	531 (2.2)	533 (2.2)	534 (2.2)	530 (2.2)	530 (2.2)	531 (2.2)
Sweden	530 (2.8)	530 (2.8)	530 (2.8)	531 (2.8)	532 (2.9)	532 (2.9)	531 (2.8)	531 (2.8)	530 (2.8)	533 (2.9)	530 (2.8)
Finland	529 (2.5)	530 (2.5)	529 (2.5)	531 (2.5)	529 (2.5)	530 (2.6)	529 (2.5)	529 (2.5)	530 (2.5)	532 (2.6)	530 (2.5)
Australia	525 (2.6)	524 (2.6)	525 (2.6)	527 (2.6)	525 (2.6)	527 (2.6)	525 (2.6)	525 (2.6)	525 (2.6)	534 (2.6)	525 (2.6)
Denmark	524 (2.1)	525 (2.1)	524 (2.1)	525 (2.2)	524 (2.1)	524 (2.1)	524 (2.1)	525 (2.1)	525 (2.1)	526 (2.2)	525 (2.1)
Germany	524 (2.1)	524 (2.2)	524 (2.1)	527 (2.2)	524 (2.2)	526 (2.2)	524 (2.2)	525 (2.2)	524 (2.2)	527 (2.2)	525 (2.2)
Serbia	523 (3.3)	523 (3.3)	523 (3.3)	523 (3.3)	523 (3.3)	526 (3.3)	525 (3.3)	525 (3.4)	522 (3.3)	523 (3.4)	522 (3.3)
Belgium (Flemish)	521 (2.4)	521 (2.4)	521 (2.4)	521 (2.4)	520 (2.4)	521 (2.4)	520 (2.5)	520 (2.5)	521 (2.4)	521 (2.5)	522 (2.5)
Hungary	520 (3.6)	520 (3.6)	520 (3.6)	521 (3.7)	521 (3.6)	523 (3.7)	523 (3.6)	523 (3.6)	519 (3.6)	525 (3.7)	521 (3.6)
Portugal	517 (2.8)	517 (2.8)	517 (2.8)	518 (2.8)	517 (2.8)	518 (2.8)	517 (2.8)	517 (2.8)	517 (2.8)	523 (2.8)	518 (2.8)
United States	517 (3.1)	517 (3.1)	517 (3.1)	518 (3.1)	517 (3.1)	518 (3.1)	517 (3.1)	516 (3.1)	516 (3.1)	519 (3.1)	516 (3.1)
Slovak Republic	515 (3.1)	514 (3.1)	515 (3.1)	516 (3.2)	515 (3.1)	516 (3.2)	517 (3.1)	517 (3.1)	514 (3.1)	519 (3.2)	515 (3.1)
Slovenia	514 (1.8)	513 (1.9)	514 (1.8)	515 (1.9)	515 (1.8)	515 (2.0)	516 (1.9)	516 (1.9)	513 (1.9)	517 (2.0)	513 (1.8)
Armenia	513 (2.8)	512 (2.8)	513 (2.8)	509 (2.8)	513 (2.8)	511 (2.8)	514 (2.8)	513 (2.8)	510 (2.8)	506 (3.0)	511 (2.8)
Italy	513 (2.8)	513 (2.8)	513 (2.8)	513 (2.8)	513 (2.8)	514 (2.8)	512 (2.8)	512 (2.8)	514 (2.8)	517 (2.9)	514 (2.8)
Albania	512 (4.9)	511 (4.9)	512 (4.9)	509 (5.0)	512 (4.9)	510 (5.0)	510 (4.8)	510 (4.9)	510 (5.0)	509 (5.2)	510 (4.9)
Canada	504 (2.0)	504 (2.0)	504 (2.0)	505 (2.0)	504 (2.0)	505 (2.0)	504 (2.0)	504 (2.0)	504 (2.0)	509 (2.0)	504 (2.0)
Georgia	498 (3.1)	499 (3.0)	498 (3.1)	498 (3.0)	498 (3.1)	499 (3.1)	499 (3.1)	499 (3.1)	497 (3.0)	495 (3.1)	496 (3.1)
Spain	498 (2.1)	498 (2.1)	498 (2.1)	498 (2.1)	498 (2.1)	498 (2.2)	498 (2.1)	498 (2.2)	499 (2.1)	499 (2.2)	499 (2.1)
United Arab Emirates	498 (1.2)	497 (1.2)	498 (1.2)	497 (1.2)	498 (1.2)	497 (1.3)	498 (1.2)	497 (1.2)	497 (1.2)	498 (1.2)	497 (1.2)
New Zealand	490 (2.6)	490 (2.6)	490 (2.6)	493 (2.7)	491 (2.6)	493 (2.7)	491 (2.7)	492 (2.7)	491 (2.6)	496 (2.8)	490 (2.6)
Belgium (French)	489 (2.4)	489 (2.4)	489 (2.4)	486 (2.4)	490 (2.4)	489 (2.4)	488 (2.4)	488 (2.4)	489 (2.4)	490 (2.5)	489 (2.4)
Kazakhstan	487 (3.6)	488 (3.6)	487 (3.6)	487 (3.7)	487 (3.6)	490 (3.7)	489 (3.7)	488 (3.7)	487 (3.6)	484 (3.7)	486 (3.6)
France	484 (2.9)	484 (2.9)	484 (2.9)	483 (2.9)	484 (2.9)	483 (2.9)	483 (2.9)	484 (2.9)	485 (2.9)	485 (2.9)	484 (2.9)
Montenegro	477 (2.1)	477 (2.1)	477 (2.1)	475 (2.1)	477 (2.1)	477 (2.2)	478 (2.1)	477 (2.1)	477 (2.1)	476 (2.2)	475 (2.1)
North Macedonia	474 (3.6)	473 (3.6)	474 (3.6)	471 (3.6)	473 (3.6)	471 (3.7)	473 (3.6)	472 (3.6)	472 (3.6)	470 (3.8)	472 (3.6)
Qatar	464 (3.5)	464 (3.5)	464 (3.5)	464 (3.5)	464 (3.5)	464 (3.5)	464 (3.5)	463 (3.5)	463 (3.4)	464 (3.6)	463 (3.5)
Bahrain	462 (4.1)	461 (4.2)	462 (4.1)	460 (4.1)	462 (4.1)	460 (4.1)	462 (4.1)	461 (4.1)	461 (4.2)	461 (4.2)	461 (4.2)
Kosovo	451 (3.4)	451 (3.4)	451 (3.4)	449 (3.4)	451 (3.4)	451 (3.4)	451 (3.4)	450 (3.4)	450 (3.4)	447 (3.5)	450 (3.4)
Bosnia & Herzegovina	447 (3.2)	447 (3.3)	447 (3.2)	446 (3.3)	447 (3.3)	449 (3.3)	448 (3.2)	447 (3.3)	447 (3.3)	449 (3.4)	446 (3.2)
Chile	444 (2.8)	444 (2.8)	444 (2.8)	445 (2.9)	444 (2.8)	446 (2.9)	445 (2.8)	445 (2.8)	445 (2.8)	449 (2.9)	444 (2.8)
Uzbekistan	443 (3.2)	444 (3.2)	443 (3.2)	443 (3.3)	443 (3.2)	445 (3.3)	444 (3.3)	443 (3.2)	442 (3.2)	436 (3.3)	442 (3.2)
Jordan	427 (5.3)	426 (5.3)	427 (5.3)	423 (5.2)	427 (5.3)	423 (5.2)	426 (5.3)	426 (5.3)	425 (5.3)	424 (5.2)	425 (5.3)
Oman	421 (4.0)	421 (4.0)	421 (4.0)	418 (4.0)	422 (4.0)	418 (4.0)	420 (4.0)	420 (4.0)	421 (4.0)	422 (4.1)	420 (4.0)
Saudi Arabia	420 (4.2)	418 (4.2)	420 (4.2)	417 (4.2)	420 (4.2)	417 (4.1)	419 (4.1)	419 (4.1)	419 (4.1)	416 (4.3)	418 (4.2)
Brazil	400 (3.4)	400 (3.5)	400 (3.4)	400 (3.5)	400 (3.4)	402 (3.4)	401 (3.4)	401 (3.4)	401 (3.4)	402 (3.5)	400 (3.5)
International Average	512 (0.4)	511 (0.4)	512 (0.4)	512 (0.4)	512 (0.4)	512 (0.4)	512 (0.4)	512 (0.4)	511 (0.4)	512 (0.4)	511 (0.4)
Benchmarking Participants											
Dubai, UAE	557 (1.6)	556 (1.6)	557 (1.6)	556 (1.6)	557 (1.6)	555 (1.6)	556 (1.6)	555 (1.6)	555 (1.6)	558 (1.6)	556 (1.6)
Quebec, Canada	515 (2.7)	515 (2.7)	515 (2.7)	514 (2.7)	514 (2.7)	514 (2.8)	513 (2.7)	513 (2.7)	515 (2.7)	519 (2.7)	515 (2.7)
Sharjah, UAE	504 (3.3)	503 (3.3)	504 (3.3)	502 (3.2)	504 (3.3)	503 (3.3)	504 (3.2)	503 (3.2)	503 (3.3)	504 (3.3)	503 (3.3)
Ontario, Canada	503 (3.4)	503 (3.4)	503 (3.4)	504 (3.4)	503 (3.4)	504 (3.4)	504 (3.4)	504 (3.4)	503 (3.4)	508 (3.4)	503 (3.4)
Abu Dhabi, UAE	459 (1.9)	458 (2.0)	459 (1.9)	458 (2.0)	459 (1.9)	458 (2.0)	458 (2.0)	458 (2.0)	458 (1.9)	459 (2.0)	458 (2.0)
Number of Items (Score Points)*	183 (192)	177 (186)	183 (192)	147 (154)	180 (189)	131 (137)	167 (176)	165 (173)	173 (182)	122 (128)	173 (182)

* The number of items and score points are based on the number of items included in scaling the fourth-grade mathematics achievement data.

See Chapter 9 in TIMSS 2023 Technical Report (Methods and Procedures) for information about items deleted or recoded for scaling.

() Standard errors appear in parentheses. Because of rounding some results may appear inconsistent.

SOURCE: IEA's Trends in International Mathematics and Science Study - TIMSS 2023
Downloaded from <https://timss2023.org/results>

Exhibit C.1: Average Scale Scores for the Mathematics Test-Curriculum Matching Analysis

Results based on items identified by each country as addressed in its curriculum

(Continued)

Country	Average Mathematics Scale Score based on All Items	Germany	Serbia	Belgium (Flemish)	Hungary	Portugal	United States	Slovak Republic	Slovenia	Armenia	Italy
Singapore	615 (2.9)	614 (2.9)	615 (2.9)	618 (3.0)	614 (2.9)	615 (2.9)	615 (2.9)	614 (2.9)	612 (2.9)	615 (2.9)	616 (2.9)
Chinese Taipei	607 (1.7)	605 (1.8)	607 (1.7)	607 (1.7)	606 (1.8)	607 (1.7)	607 (1.8)	603 (1.8)	603 (1.7)	607 (1.7)	607 (1.7)
Hong Kong SAR	594 (4.0)	593 (4.1)	594 (4.0)	594 (4.0)	594 (4.1)	594 (4.0)	595 (4.1)	592 (4.0)	594 (4.0)	594 (4.0)	594 (4.1)
Korea, Rep. of	594 (2.6)	593 (2.7)	594 (2.6)	598 (2.6)	593 (2.7)	594 (2.6)	594 (2.7)	591 (2.6)	592 (2.6)	594 (2.6)	596 (2.6)
Japan	591 (2.3)	589 (2.4)	591 (2.3)	590 (2.3)	590 (2.4)	591 (2.3)	590 (2.4)	589 (2.3)	590 (2.3)	591 (2.3)	591 (2.3)
Macao SAR	582 (1.0)	580 (1.1)	582 (1.0)	583 (1.1)	582 (1.1)	582 (1.0)	582 (1.1)	581 (1.1)	581 (1.1)	582 (1.0)	582 (1.1)
Lithuania	561 (2.9)	560 (2.9)	561 (2.9)	561 (2.9)	561 (3.0)	561 (2.9)	560 (2.9)	563 (3.0)	565 (3.0)	561 (2.9)	560 (2.9)
Türkiye (5)	553 (4.1)	554 (4.2)	553 (4.1)	553 (4.0)	554 (4.1)	553 (4.1)	553 (4.2)	553 (4.0)	553 (4.1)	553 (4.1)	553 (4.1)
England	552 (2.7)	551 (2.7)	552 (2.7)	553 (2.7)	551 (2.8)	552 (2.7)	553 (2.7)	554 (2.7)	552 (2.7)	552 (2.7)	552 (2.7)
Ireland	546 (2.9)	546 (2.9)	546 (2.9)	546 (2.9)	546 (2.9)	546 (2.9)	546 (2.9)	546 (3.0)	545 (3.0)	546 (2.9)	546 (2.9)
Poland	546 (2.0)	548 (2.1)	546 (2.0)	548 (2.1)	546 (2.1)	546 (2.0)	547 (2.0)	549 (2.1)	547 (2.0)	546 (2.0)	546 (2.0)
Romania	542 (4.8)	543 (4.9)	542 (4.8)	541 (4.9)	544 (4.8)	542 (4.8)	543 (4.9)	542 (4.9)	545 (4.9)	542 (4.8)	542 (4.8)
Netherlands	537 (2.0)	540 (2.0)	537 (2.0)	538 (2.0)	537 (2.0)	537 (2.0)	536 (2.0)	540 (2.1)	540 (2.1)	537 (2.0)	537 (2.0)
Latvia	534 (2.8)	534 (2.9)	534 (2.8)	535 (2.9)	535 (2.9)	534 (2.8)	534 (2.8)	535 (2.9)	536 (2.9)	534 (2.8)	535 (2.8)
Norway (5)	531 (2.0)	531 (2.0)	531 (2.0)	531 (2.1)	530 (2.0)	531 (2.0)	531 (2.0)	534 (2.0)	532 (2.0)	531 (2.0)	531 (2.0)
Czech Republic	530 (2.2)	534 (2.2)	530 (2.2)	531 (2.2)	531 (2.2)	530 (2.2)	532 (2.2)	533 (2.2)	533 (2.2)	530 (2.2)	531 (2.2)
Sweden	530 (2.8)	529 (2.8)	530 (2.8)	532 (2.9)	530 (2.8)	530 (2.8)	530 (2.8)	533 (2.9)	532 (2.9)	530 (2.8)	530 (2.8)
Finland	529 (2.5)	528 (2.5)	529 (2.5)	530 (2.5)	528 (2.5)	529 (2.5)	529 (2.5)	530 (2.6)	529 (2.5)	529 (2.5)	529 (2.5)
Australia	525 (2.6)	526 (2.6)	525 (2.6)	526 (2.6)	525 (2.6)	525 (2.6)	525 (2.6)	527 (2.6)	526 (2.6)	525 (2.6)	525 (2.6)
Denmark	524 (2.1)	523 (2.1)	524 (2.1)	524 (2.1)	523 (2.1)	524 (2.1)	523 (2.1)	524 (2.1)	523 (2.1)	524 (2.1)	524 (2.1)
Germany	524 (2.1)	527 (2.2)	524 (2.1)	524 (2.2)	523 (2.2)	524 (2.2)	524 (2.1)	525 (2.2)	525 (2.2)	524 (2.1)	524 (2.1)
Serbia	523 (3.3)	526 (3.3)	523 (3.3)	523 (3.4)	524 (3.3)	523 (3.3)	524 (3.2)	523 (3.4)	525 (3.4)	523 (3.3)	523 (3.3)
Belgium (Flemish)	521 (2.4)	521 (2.5)	521 (2.4)	522 (2.4)	520 (2.5)	521 (2.4)	521 (2.5)	519 (2.4)	518 (2.4)	521 (2.4)	521 (2.4)
Hungary	520 (3.6)	523 (3.6)	520 (3.6)	520 (3.7)	523 (3.6)	520 (3.6)	522 (3.6)	525 (3.7)	525 (3.7)	520 (3.6)	520 (3.6)
Portugal	517 (2.8)	518 (2.8)	517 (2.8)	517 (2.8)	517 (2.8)	517 (2.8)	518 (2.8)	519 (2.8)	517 (2.8)	517 (2.8)	517 (2.8)
United States	517 (3.1)	517 (3.1)	517 (3.1)	518 (3.1)	518 (3.1)	517 (3.1)	517 (3.1)	520 (3.1)	519 (3.1)	517 (3.1)	516 (3.1)
Slovak Republic	515 (3.1)	517 (3.2)	515 (3.1)	516 (3.1)	515 (3.1)	515 (3.1)	515 (3.1)	521 (3.2)	518 (3.2)	515 (3.1)	515 (3.1)
Slovenia	514 (1.8)	517 (1.9)	514 (1.8)	514 (1.9)	515 (1.9)	514 (1.8)	514 (1.8)	517 (2.0)	517 (1.9)	514 (1.8)	513 (1.8)
Armenia	513 (2.8)	512 (2.8)	513 (2.8)	511 (2.8)	514 (2.8)	513 (2.8)	514 (2.8)	511 (2.8)	514 (2.8)	513 (2.8)	512 (2.8)
Italy	513 (2.8)	514 (2.8)	513 (2.8)	513 (2.8)	513 (2.8)	513 (2.8)	514 (2.8)	513 (2.9)	512 (2.8)	513 (2.8)	513 (2.8)
Albania	512 (4.9)	510 (4.9)	512 (4.9)	509 (5.0)	511 (4.8)	512 (4.9)	512 (4.9)	509 (4.9)	510 (4.9)	512 (4.9)	512 (5.0)
Canada	504 (2.0)	504 (2.0)	504 (2.0)	504 (2.0)	505 (2.0)	504 (2.0)	504 (2.0)	507 (2.1)	505 (2.0)	504 (2.0)	504 (2.0)
Georgia	498 (3.1)	499 (3.1)	498 (3.1)	497 (3.1)	499 (3.1)	498 (3.1)	499 (3.0)	500 (3.0)	500 (3.1)	498 (3.1)	498 (3.1)
Spain	498 (2.1)	498 (2.2)	498 (2.1)	499 (2.1)	498 (2.1)	498 (2.1)	498 (2.1)	499 (2.2)	498 (2.2)	498 (2.1)	498 (2.1)
United Arab Emirates	498 (1.2)	497 (1.2)	498 (1.2)	498 (1.3)	498 (1.2)	498 (1.2)	498 (1.2)	498 (1.3)	498 (1.2)	498 (1.2)	498 (1.2)
New Zealand	490 (2.6)	491 (2.7)	490 (2.6)	491 (2.6)	490 (2.7)	490 (2.6)	490 (2.7)	494 (2.7)	493 (2.7)	490 (2.6)	490 (2.7)
Belgium (French)	489 (2.4)	488 (2.4)	489 (2.4)	491 (2.5)	489 (2.4)	489 (2.4)	489 (2.4)	487 (2.5)	487 (2.4)	489 (2.4)	490 (2.4)
Kazakhstan	487 (3.6)	487 (3.7)	487 (3.6)	487 (3.7)	489 (3.7)	487 (3.6)	488 (3.6)	488 (3.7)	492 (3.7)	487 (3.6)	487 (3.6)
France	484 (2.9)	483 (2.9)	484 (2.9)	484 (2.9)	483 (2.9)	484 (2.9)	484 (2.9)	483 (2.9)	483 (3.0)	484 (2.9)	484 (2.9)
Montenegro	477 (2.1)	477 (2.1)	477 (2.1)	477 (2.1)	477 (2.1)	477 (2.1)	478 (2.0)	476 (2.1)	478 (2.1)	477 (2.1)	477 (2.1)
North Macedonia	474 (3.6)	472 (3.7)	474 (3.6)	471 (3.6)	473 (3.6)	474 (3.6)	474 (3.6)	471 (3.7)	472 (3.6)	474 (3.6)	473 (3.6)
Qatar	464 (3.5)	463 (3.5)	464 (3.5)	465 (3.5)	464 (3.4)	464 (3.5)	464 (3.5)	466 (3.5)	465 (3.5)	464 (3.5)	463 (3.5)
Bahrain	462 (4.1)	461 (4.2)	462 (4.1)	461 (4.2)	463 (4.1)	462 (4.2)	462 (4.2)	461 (4.2)	462 (4.1)	462 (4.1)	461 (4.2)
Kosovo	451 (3.4)	450 (3.5)	451 (3.4)	450 (3.4)	451 (3.5)	451 (3.4)	453 (3.5)	449 (3.4)	451 (3.5)	451 (3.4)	451 (3.4)
Bosnia & Herzegovina	447 (3.2)	449 (3.3)	447 (3.2)	447 (3.4)	447 (3.2)	447 (3.2)	448 (3.2)	447 (3.3)	448 (3.3)	447 (3.2)	447 (3.3)
Chile	444 (2.8)	444 (2.9)	444 (2.8)	443 (2.9)	445 (2.8)	444 (2.8)	442 (2.8)	446 (2.9)	446 (2.8)	444 (2.8)	443 (2.8)
Uzbekistan	443 (3.2)	444 (3.2)	443 (3.2)	442 (3.2)	444 (3.2)	443 (3.2)	443 (3.2)	442 (3.3)	444 (3.3)	443 (3.2)	443 (3.2)
Jordan	427 (5.3)	426 (5.2)	427 (5.3)	427 (5.2)	427 (5.3)	427 (5.3)	429 (5.3)	425 (5.2)	425 (5.2)	427 (5.3)	426 (5.3)
Oman	421 (4.0)	420 (4.0)	421 (4.0)	420 (4.0)	422 (4.0)	421 (4.0)	422 (4.1)	420 (4.0)	419 (4.0)	421 (4.0)	421 (4.0)
Saudi Arabia	420 (4.2)	418 (4.2)	419 (4.2)	419 (4.1)	420 (4.2)	419 (4.2)	420 (4.2)	417 (4.2)	418 (4.1)	420 (4.2)	419 (4.2)
Brazil	400 (3.4)	400 (3.5)	400 (3.4)	400 (3.5)	401 (3.4)	400 (3.4)	400 (3.4)	400 (3.5)	402 (3.5)	400 (3.4)	400 (3.4)
International Average	512 (0.4)	512 (0.4)	512 (0.4)	512 (0.4)	512 (0.4)	512 (0.4)	512 (0.4)	512 (0.4)	512 (0.4)	512 (0.4)	511 (0.4)
Benchmarking Participants											
Dubai, UAE	557 (1.6)	555 (1.6)	557 (1.6)	557 (1.6)	557 (1.6)	557 (1.6)	557 (1.6)	558 (1.6)	557 (1.6)	557 (1.6)	556 (1.6)
Quebec, Canada	515 (2.7)	513 (2.7)	515 (2.7)	515 (2.7)	514 (2.7)	515 (2.7)	514 (2.7)	515 (2.8)	512 (2.7)	515 (2.7)	515 (2.7)
Sharjah, UAE	504 (3.3)	503 (3.3)	504 (3.3)	503 (3.3)	504 (3.3)	504 (3.3)	504 (3.3)	504 (3.3)	504 (3.2)	504 (3.3)	503 (3.3)
Ontario, Canada	503 (3.4)	503 (3.4)	503 (3.4)	503 (3.4)	504 (3.4)	503 (3.4)	503 (3.4)	507 (3.5)	505 (3.4)	503 (3.4)	503 (3.4)
Abu Dhabi, UAE	459 (1.9)	458 (2.0)	459 (1.9)	458 (2.0)	459 (2.0)	459 (1.9)	459 (2.0)	460 (2.0)	459 (2.0)	459 (1.9)	458 (2.0)
Number of Items (Score Points)*	183 (192)	153 (161)	183 (192)	154 (163)	167 (176)	183 (192)	169 (178)	136 (144)	153 (161)	183 (192)	177 (186)

* The number of items and score points are based on the number of items included in scaling the fourth-grade mathematics achievement data.

See Chapter 9 in TIMSS 2023 Technical Report (Methods and Procedures) for information about items deleted or recoded for scaling.

() Standard errors appear in parentheses. Because of rounding some results may appear inconsistent.

SOURCE: IEA's Trends in International Mathematics and Science Study - TIMSS 2023
Downloaded from <https://timss2023.org/results>

Exhibit C.1: Average Scale Scores for the Mathematics Test-Curriculum Matching Analysis

Results based on items identified by each country as addressed in its curriculum

(Continued)

Country	Average Mathematics Scale Score based on All Items	Albania	Canada	Georgia	Spain	United Arab Emirates	New Zealand	Belgium (French)	Kazakhstan	France	Montenegro
Singapore	615 (2.9)	615 (2.9)	614 (2.9)	611 (2.9)	613 (2.9)	615 (2.9)	617 (2.9)	615 (3.0)	615 (2.9)	614 (2.9)	613 (3.0)
Chinese Taipei	607 (1.7)	607 (1.7)	602 (1.8)	604 (1.8)	607 (1.7)	607 (1.7)	610 (1.8)	607 (1.8)	609 (1.8)	608 (1.7)	604 (1.8)
Hong Kong SAR	594 (4.0)	594 (4.0)	592 (4.1)	594 (4.0)	593 (4.1)	594 (4.0)	595 (4.0)	594 (4.0)	596 (4.2)	594 (4.0)	595 (4.1)
Korea, Rep. of	594 (2.6)	594 (2.6)	596 (2.6)	593 (2.6)	595 (2.6)	594 (2.6)	597 (2.6)	593 (2.7)	592 (2.7)	595 (2.6)	592 (2.7)
Japan	591 (2.3)	590 (2.3)	585 (2.4)	589 (2.3)	591 (2.3)	591 (2.3)	593 (2.4)	588 (2.4)	589 (2.5)	592 (2.3)	588 (2.5)
Macao SAR	582 (1.0)	582 (1.1)	581 (1.1)	581 (1.1)	581 (1.1)	582 (1.0)	584 (1.1)	581 (1.1)	582 (1.1)	582 (1.0)	582 (1.1)
Lithuania	561 (2.9)	561 (2.9)	561 (3.0)	567 (3.0)	562 (2.9)	561 (2.9)	560 (2.9)	562 (3.0)	559 (2.9)	562 (2.9)	561 (3.0)
Türkiye (5)	553 (4.1)	553 (4.1)	554 (4.1)	554 (4.1)	555 (4.1)	553 (4.1)	554 (4.1)	554 (4.1)	552 (4.3)	554 (4.1)	554 (4.1)
England	552 (2.7)	552 (2.7)	554 (2.8)	551 (2.7)	551 (2.7)	552 (2.7)	553 (2.7)	552 (2.8)	551 (2.8)	551 (2.7)	552 (2.8)
Ireland	546 (2.9)	546 (2.9)	547 (3.0)	545 (2.9)	547 (2.9)	546 (2.9)	547 (3.0)	547 (3.0)	546 (3.0)	546 (2.9)	547 (3.0)
Poland	546 (2.0)	546 (2.0)	549 (2.0)	549 (2.0)	548 (2.0)	546 (2.0)	546 (2.0)	548 (2.1)	546 (2.1)	546 (2.0)	551 (2.1)
Romania	542 (4.8)	542 (4.8)	544 (5.0)	545 (5.0)	543 (4.9)	542 (4.8)	541 (4.9)	544 (4.9)	548 (4.8)	543 (4.8)	545 (4.9)
Netherlands	537 (2.0)	537 (2.0)	537 (2.0)	541 (2.0)	539 (2.0)	537 (2.0)	537 (1.9)	537 (2.0)	535 (2.0)	538 (2.0)	537 (2.0)
Latvia	534 (2.8)	534 (2.8)	536 (2.9)	538 (2.9)	535 (2.9)	534 (2.8)	535 (2.9)	535 (2.9)	535 (2.8)	535 (2.8)	535 (3.0)
Norway (5)	531 (2.0)	530 (2.0)	532 (2.1)	533 (2.1)	532 (2.0)	531 (2.0)	531 (2.0)	531 (2.0)	529 (2.0)	531 (2.0)	531 (2.1)
Czech Republic	530 (2.2)	531 (2.2)	532 (2.2)	531 (2.2)	531 (2.2)	530 (2.2)	530 (2.2)	532 (2.2)	535 (2.1)	530 (2.2)	532 (2.2)
Sweden	530 (2.8)	530 (2.8)	532 (2.9)	531 (2.8)	529 (2.8)	530 (2.8)	530 (2.8)	530 (2.8)	528 (2.8)	530 (2.8)	531 (2.8)
Finland	529 (2.5)	529 (2.5)	530 (2.6)	530 (2.5)	530 (2.5)	529 (2.5)	528 (2.5)	529 (2.5)	528 (2.4)	530 (2.5)	530 (2.6)
Australia	525 (2.6)	525 (2.6)	528 (2.5)	525 (2.6)	526 (2.6)	525 (2.6)	527 (2.6)	526 (2.6)	521 (2.7)	525 (2.6)	527 (2.6)
Denmark	524 (2.1)	524 (2.1)	522 (2.1)	524 (2.1)	525 (2.1)	524 (2.1)	524 (2.1)	523 (2.1)	521 (2.2)	525 (2.1)	522 (2.1)
Germany	524 (2.1)	524 (2.1)	525 (2.2)	525 (2.2)	525 (2.2)	524 (2.1)	524 (2.1)	525 (2.2)	525 (2.1)	524 (2.2)	524 (2.2)
Serbia	523 (3.3)	523 (3.3)	525 (3.4)	524 (3.4)	523 (3.3)	523 (3.3)	523 (3.4)	525 (3.3)	528 (3.2)	523 (3.3)	525 (3.3)
Belgium (Flemish)	521 (2.4)	521 (2.4)	519 (2.4)	519 (2.4)	521 (2.4)	521 (2.4)	520 (2.5)	521 (2.5)	520 (2.4)	521 (2.4)	521 (2.4)
Hungary	520 (3.6)	520 (3.6)	525 (3.7)	521 (3.8)	520 (3.6)	520 (3.6)	521 (3.6)	522 (3.6)	525 (3.5)	519 (3.6)	524 (3.6)
Portugal	517 (2.8)	517 (2.8)	519 (2.8)	517 (2.8)	518 (2.8)	517 (2.8)	520 (2.8)	518 (2.8)	514 (2.9)	517 (2.8)	518 (2.8)
United States	517 (3.1)	517 (3.1)	518 (3.1)	518 (3.1)	517 (3.1)	517 (3.1)	516 (3.1)	518 (3.1)	516 (3.2)	516 (3.1)	519 (3.1)
Slovak Republic	515 (3.1)	515 (3.1)	518 (3.1)	516 (3.2)	513 (3.1)	515 (3.1)	514 (3.2)	516 (3.1)	517 (3.1)	514 (3.1)	517 (3.1)
Slovenia	514 (1.8)	514 (1.8)	516 (2.0)	514 (1.9)	514 (1.8)	515 (1.9)	515 (1.9)	515 (1.9)	514 (1.8)	513 (1.8)	516 (1.9)
Armenia	513 (2.8)	513 (2.8)	512 (2.8)	513 (2.9)	509 (2.9)	513 (2.8)	510 (2.9)	514 (2.8)	523 (2.7)	511 (2.8)	516 (2.8)
Italy	513 (2.8)	513 (2.8)	515 (2.8)	512 (2.8)	515 (2.8)	513 (2.8)	516 (2.8)	514 (2.8)	515 (2.8)	513 (2.8)	515 (2.8)
Albania	512 (4.9)	512 (4.9)	511 (5.0)	510 (4.9)	509 (5.0)	512 (4.9)	509 (5.1)	513 (5.0)	518 (4.8)	511 (5.0)	514 (4.8)
Canada	504 (2.0)	504 (2.0)	506 (2.1)	504 (2.0)	505 (2.0)	504 (2.0)	505 (2.0)	504 (2.0)	501 (2.0)	504 (2.0)	506 (2.0)
Georgia	498 (3.1)	498 (3.1)	499 (3.0)	502 (3.1)	497 (3.1)	498 (3.1)	495 (3.1)	500 (3.1)	504 (3.0)	498 (3.1)	501 (3.1)
Spain	498 (2.1)	498 (2.1)	498 (2.2)	498 (2.1)	499 (2.1)	498 (2.1)	500 (2.1)	498 (2.1)	497 (2.2)	499 (2.1)	497 (2.2)
United Arab Emirates	498 (1.2)	498 (1.2)	498 (1.3)	497 (1.2)	496 (1.2)	498 (1.2)	498 (1.2)	498 (1.2)	498 (1.3)	498 (1.2)	498 (1.3)
New Zealand	490 (2.6)	490 (2.6)	491 (2.7)	492 (2.7)	491 (2.7)	490 (2.6)	492 (2.7)	491 (2.7)	486 (2.7)	490 (2.6)	491 (2.7)
Belgium (French)	489 (2.4)	489 (2.4)	487 (2.5)	488 (2.5)	489 (2.4)	489 (2.4)	491 (2.4)	490 (2.4)	489 (2.4)	489 (2.4)	490 (2.4)
Kazakhstan	487 (3.6)	487 (3.6)	487 (3.7)	491 (3.7)	485 (3.7)	487 (3.6)	487 (3.7)	488 (3.7)	491 (3.6)	488 (3.6)	489 (3.7)
France	484 (2.9)	484 (2.9)	482 (3.0)	484 (3.0)	485 (2.9)	484 (2.9)	486 (2.9)	484 (2.9)	485 (2.9)	484 (2.9)	482 (2.9)
Montenegro	477 (2.1)	477 (2.1)	478 (2.2)	479 (2.1)	476 (2.1)	477 (2.1)	475 (2.1)	479 (2.1)	482 (2.1)	478 (2.1)	481 (2.1)
North Macedonia	474 (3.6)	474 (3.6)	473 (3.7)	472 (3.6)	472 (3.6)	474 (3.6)	472 (3.7)	475 (3.6)	479 (3.5)	473 (3.6)	474 (3.6)
Qatar	464 (3.5)	464 (3.5)	463 (3.5)	464 (3.5)	462 (3.5)	464 (3.5)	464 (3.5)	464 (3.5)	461 (3.5)	463 (3.5)	464 (3.4)
Bahrain	462 (4.1)	461 (4.2)	461 (4.2)	461 (4.2)	461 (4.2)	462 (4.1)	462 (4.2)	462 (4.2)	461 (4.3)	461 (4.2)	463 (4.2)
Kosovo	451 (3.4)	452 (3.4)	451 (3.4)	452 (3.5)	448 (3.4)	451 (3.4)	450 (3.4)	453 (3.4)	457 (3.4)	452 (3.4)	451 (3.5)
Bosnia & Herzegovina	447 (3.2)	447 (3.3)	449 (3.3)	449 (3.3)	447 (3.3)	447 (3.2)	447 (3.3)	449 (3.3)	453 (3.2)	448 (3.3)	451 (3.2)
Chile	444 (2.8)	443 (2.8)	445 (2.9)	445 (2.9)	445 (2.9)	444 (2.8)	446 (2.8)	443 (2.8)	437 (2.9)	445 (2.8)	443 (2.9)
Uzbekistan	443 (3.2)	443 (3.2)	443 (3.2)	444 (3.3)	441 (3.2)	443 (3.2)	442 (3.3)	445 (3.2)	453 (3.1)	443 (3.2)	446 (3.3)
Jordan	427 (5.3)	427 (5.3)	426 (5.1)	426 (5.3)	425 (5.2)	427 (5.3)	426 (5.2)	429 (5.3)	433 (5.3)	426 (5.4)	430 (5.2)
Oman	421 (4.0)	421 (4.1)	421 (4.0)	419 (4.0)	420 (4.0)	421 (4.0)	421 (4.0)	422 (4.1)	422 (4.1)	421 (4.0)	424 (4.0)
Saudi Arabia	420 (4.2)	419 (4.2)	418 (4.2)	419 (4.1)	419 (4.1)	420 (4.2)	418 (4.2)	420 (4.2)	420 (4.3)	419 (4.2)	422 (4.2)
Brazil	400 (3.4)	400 (3.4)	400 (3.5)	402 (3.5)	402 (3.5)	400 (3.4)	401 (3.5)	401 (3.4)	398 (3.4)	401 (3.4)	401 (3.4)
International Average	512 (0.4)	512 (0.4)	512 (0.4)	512 (0.4)	511 (0.4)	512 (0.4)	512 (0.4)	512 (0.4)	513 (0.4)	512 (0.4)	513 (0.4)
Benchmarking Participants											
Dubai, UAE	557 (1.6)	557 (1.6)	557 (1.6)	556 (1.6)	555 (1.6)	557 (1.6)	557 (1.6)	556 (1.6)	555 (1.6)	556 (1.6)	556 (1.6)
Quebec, Canada	515 (2.7)	515 (2.7)	515 (2.7)	512 (2.7)	515 (2.7)	515 (2.7)	516 (2.8)	514 (2.6)	514 (2.7)	515 (2.7)	514 (2.7)
Sharjah, UAE	504 (3.3)	504 (3.3)	503 (3.3)	503 (3.2)	502 (3.3)	504 (3.3)	505 (3.3)	504 (3.3)	505 (3.3)	503 (3.2)	504 (3.3)
Ontario, Canada	503 (3.4)	503 (3.4)	506 (3.5)	504 (3.4)	504 (3.3)	503 (3.4)	503 (3.4)	504 (3.4)	499 (3.3)	503 (3.4)	506 (3.4)
Abu Dhabi, UAE	459 (1.9)	458 (2.0)	459 (2.0)	459 (2.0)	457 (1.9)	459 (1.9)	459 (2.0)	459 (2.0)	459 (1.9)	458 (1.9)	459 (2.0)
Number of Items (Score Points)*	183 (192)	180 (189)	140 (147)	148 (155)	157 (165)	183 (192)	152 (161)	162 (169)	143 (149)	178 (187)	140 (148)

* The number of items and score points are based on the number of items included in scaling the fourth-grade mathematics achievement data.

See Chapter 9 in TIMSS 2023 Technical Report (Methods and Procedures) for information about items deleted or recoded for scaling.

() Standard errors appear in parentheses. Because of rounding some results may appear inconsistent.

SOURCE: IEA's Trends in International Mathematics and Science Study - TIMSS 2023
Downloaded from <https://timss2023.org/results>

Exhibit C.1: Average Scale Scores for the Mathematics Test-Curriculum Matching Analysis

Results based on items identified by each country as addressed in its curriculum

(Continued)

Country	Average Mathematics Scale Score based on All Items	North Macedonia	Qatar	Bahrain	Kosovo	Bosnia & Herzegovina	Chile	Uzbekistan	Jordan	Oman	Saudi Arabia
Singapore	615 (2.9)	613 (2.9)	614 (3.0)	614 (2.9)	615 (2.9)	614 (2.9)	613 (3.0)	615 (2.9)	615 (2.9)	615 (2.9)	615 (2.9)
Chinese Taipei	607 (1.7)	605 (1.7)	605 (1.8)	607 (1.7)	607 (1.7)	607 (1.7)	605 (1.8)	607 (1.7)	607 (1.7)	607 (1.7)	607 (1.7)
Hong Kong SAR	594 (4.0)	595 (4.0)	594 (4.0)	594 (4.0)	594 (4.0)	594 (4.0)	595 (4.1)	594 (4.0)	594 (4.0)	594 (4.0)	594 (4.0)
Korea, Rep. of	594 (2.6)	594 (2.7)	595 (2.7)	595 (2.6)	595 (2.7)	595 (2.7)	593 (2.7)	594 (2.6)	594 (2.6)	594 (2.6)	594 (2.6)
Japan	591 (2.3)	589 (2.4)	587 (2.3)	591 (2.3)	591 (2.3)	591 (2.4)	588 (2.5)	591 (2.3)	591 (2.3)	591 (2.3)	590 (2.3)
Macao SAR	582 (1.0)	583 (1.0)	582 (1.1)	582 (1.0)	582 (1.0)	582 (1.1)	583 (1.1)	582 (1.0)	582 (1.0)	582 (1.0)	582 (1.0)
Lithuania	561 (2.9)	563 (3.0)	561 (3.0)	561 (2.9)	561 (2.9)	561 (2.9)	561 (3.0)	561 (2.9)	561 (2.9)	561 (2.9)	561 (2.9)
Türkiye (5)	553 (4.1)	555 (4.2)	555 (4.1)	553 (4.1)	553 (4.1)	553 (4.0)	553 (4.2)	553 (4.1)	553 (4.1)	553 (4.1)	554 (4.1)
England	552 (2.7)	552 (2.8)	554 (2.7)	551 (2.7)	552 (2.7)	551 (2.7)	552 (2.8)	552 (2.7)	552 (2.7)	552 (2.7)	552 (2.7)
Ireland	546 (2.9)	546 (3.0)	547 (3.0)	545 (2.9)	546 (2.9)	545 (2.9)	545 (3.0)	546 (2.9)	546 (2.9)	546 (2.9)	546 (2.9)
Poland	546 (2.0)	549 (2.1)	548 (2.1)	546 (2.0)	546 (2.0)	547 (2.0)	549 (2.1)	546 (2.0)	546 (2.0)	546 (2.0)	547 (2.0)
Romania	542 (4.8)	543 (5.0)	544 (4.8)	542 (4.8)	542 (4.8)	543 (4.9)	544 (4.9)	542 (4.8)	542 (4.8)	542 (4.8)	542 (4.8)
Netherlands	537 (2.0)	537 (2.0)	538 (2.0)	537 (2.0)	537 (2.0)	537 (2.0)	537 (2.0)	537 (2.0)	537 (2.0)	537 (2.0)	537 (2.0)
Latvia	534 (2.8)	536 (2.9)	535 (2.9)	535 (2.8)	534 (2.8)	535 (2.8)	536 (2.9)	534 (2.8)	534 (2.8)	534 (2.8)	534 (2.8)
Norway (5)	531 (2.0)	531 (2.0)	532 (2.1)	531 (2.0)	531 (2.0)	530 (2.0)	531 (2.0)	531 (2.0)	531 (2.0)	531 (2.0)	531 (2.0)
Czech Republic	530 (2.2)	530 (2.2)	532 (2.2)	531 (2.2)	530 (2.2)	532 (2.2)	532 (2.2)	530 (2.2)	530 (2.2)	530 (2.2)	531 (2.2)
Sweden	530 (2.8)	531 (2.8)	532 (2.8)	530 (2.8)	530 (2.8)	531 (2.8)	531 (2.8)	530 (2.8)	530 (2.8)	530 (2.8)	530 (2.8)
Finland	529 (2.5)	530 (2.5)	530 (2.5)	529 (2.5)	529 (2.5)	529 (2.5)	530 (2.5)	529 (2.5)	529 (2.5)	529 (2.5)	529 (2.5)
Australia	525 (2.6)	526 (2.6)	528 (2.5)	525 (2.6)	525 (2.6)	525 (2.6)	527 (2.6)	525 (2.6)	525 (2.6)	525 (2.6)	525 (2.6)
Denmark	524 (2.1)	522 (2.1)	524 (2.1)	524 (2.1)	524 (2.1)	523 (2.1)	524 (2.1)	524 (2.1)	524 (2.1)	524 (2.1)	524 (2.1)
Germany	524 (2.1)	524 (2.2)	525 (2.2)	524 (2.2)	524 (2.2)	524 (2.1)	525 (2.2)	524 (2.1)	524 (2.2)	524 (2.1)	524 (2.1)
Serbia	523 (3.3)	524 (3.4)	523 (3.3)	523 (3.3)	523 (3.3)	524 (3.3)	523 (3.3)	523 (3.3)	523 (3.3)	523 (3.3)	523 (3.3)
Belgium (Flemish)	521 (2.4)	520 (2.4)	519 (2.5)	521 (2.4)	521 (2.4)	520 (2.4)	521 (2.5)	521 (2.4)	521 (2.4)	521 (2.4)	520 (2.4)
Hungary	520 (3.6)	522 (3.6)	523 (3.7)	521 (3.6)	520 (3.6)	522 (3.6)	524 (3.6)	520 (3.6)	520 (3.6)	520 (3.6)	520 (3.6)
Portugal	517 (2.8)	518 (2.8)	519 (2.8)	517 (2.8)	517 (2.8)	517 (2.8)	517 (2.8)	517 (2.8)	517 (2.8)	517 (2.8)	517 (2.8)
United States	517 (3.1)	517 (3.1)	518 (3.1)	517 (3.1)	517 (3.1)	517 (3.1)	519 (3.1)	517 (3.1)	517 (3.1)	517 (3.1)	517 (3.1)
Slovak Republic	515 (3.1)	517 (3.1)	517 (3.1)	515 (3.1)	515 (3.1)	515 (3.1)	517 (3.1)	515 (3.1)	515 (3.1)	515 (3.1)	515 (3.1)
Slovenia	514 (1.8)	515 (1.9)	515 (1.9)	514 (1.8)	514 (1.8)	515 (1.8)	515 (1.9)	514 (1.8)	514 (1.8)	514 (1.8)	514 (1.8)
Armenia	513 (2.8)	513 (2.8)	513 (2.8)	512 (2.8)	513 (2.8)	513 (2.8)	515 (2.8)	513 (2.8)	513 (2.8)	513 (2.8)	512 (2.8)
Italy	513 (2.8)	514 (2.8)	514 (2.8)	513 (2.8)	513 (2.8)	513 (2.8)	514 (2.8)	513 (2.8)	513 (2.8)	513 (2.8)	513 (2.8)
Albania	512 (4.9)	512 (5.0)	511 (5.1)	511 (4.9)	512 (4.9)	510 (4.9)	513 (4.8)	512 (4.9)	512 (4.9)	512 (4.9)	511 (5.0)
Canada	504 (2.0)	504 (2.0)	505 (2.0)	504 (2.0)	504 (2.0)	504 (2.0)	505 (2.0)	504 (2.0)	504 (2.0)	504 (2.0)	504 (2.0)
Georgia	498 (3.1)	499 (3.1)	499 (3.1)	498 (3.1)	498 (3.1)	499 (3.1)	499 (3.1)	498 (3.1)	498 (3.1)	498 (3.1)	497 (3.1)
Spain	498 (2.1)	498 (2.1)	498 (2.2)	498 (2.1)	498 (2.1)	498 (2.1)	497 (2.2)	498 (2.1)	498 (2.1)	498 (2.1)	498 (2.1)
United Arab Emirates	498 (1.2)	498 (1.2)	499 (1.3)	498 (1.2)	498 (1.2)	498 (1.2)	499 (1.3)	498 (1.2)	498 (1.2)	498 (1.2)	498 (1.2)
New Zealand	490 (2.6)	491 (2.7)	491 (2.7)	490 (2.6)	490 (2.6)	490 (2.6)	491 (2.7)	490 (2.6)	490 (2.6)	490 (2.6)	491 (2.6)
Belgium (French)	489 (2.4)	489 (2.4)	488 (2.4)	490 (2.4)	490 (2.4)	489 (2.4)	490 (2.4)	489 (2.4)	489 (2.4)	489 (2.4)	489 (2.4)
Kazakhstan	487 (3.6)	488 (3.7)	486 (3.7)	487 (3.6)	487 (3.6)	488 (3.6)	487 (3.7)	487 (3.6)	487 (3.6)	487 (3.6)	487 (3.6)
France	484 (2.9)	483 (2.9)	483 (3.0)	484 (2.9)	484 (2.9)	484 (2.9)	483 (2.9)	484 (2.9)	484 (2.9)	484 (2.9)	484 (2.9)
Montenegro	477 (2.1)	478 (2.1)	477 (2.1)	477 (2.1)	477 (2.1)	477 (2.1)	477 (2.1)	477 (2.0)	477 (2.1)	477 (2.1)	477 (2.1)
North Macedonia	474 (3.6)	474 (3.6)	473 (3.7)	473 (3.6)	474 (3.6)	473 (3.6)	474 (3.7)	474 (3.6)	473 (3.5)	474 (3.6)	473 (3.6)
Qatar	464 (3.5)	464 (3.5)	465 (3.5)	464 (3.5)	464 (3.5)	464 (3.5)	464 (3.5)	464 (3.5)	464 (3.5)	464 (3.5)	464 (3.5)
Bahrain	462 (4.1)	461 (4.2)	462 (4.2)	461 (4.1)	462 (4.2)	461 (4.1)	463 (4.2)	462 (4.1)	462 (4.1)	462 (4.2)	461 (4.2)
Kosovo	451 (3.4)	451 (3.5)	451 (3.5)	451 (3.4)	451 (3.4)	451 (3.4)	452 (3.5)	451 (3.4)	451 (3.4)	451 (3.4)	451 (3.5)
Bosnia & Herzegovina	447 (3.2)	448 (3.2)	448 (3.2)	447 (3.3)	447 (3.3)	448 (3.2)	446 (3.2)	447 (3.2)	447 (3.2)	447 (3.2)	447 (3.3)
Chile	444 (2.8)	445 (2.8)	444 (2.9)	444 (2.8)	444 (2.8)	444 (2.8)	443 (2.9)	444 (2.8)	444 (2.8)	444 (2.8)	444 (2.8)
Uzbekistan	443 (3.2)	444 (3.3)	442 (3.2)	443 (3.2)	443 (3.2)	443 (3.2)	444 (3.3)	444 (3.2)	443 (3.2)	443 (3.2)	443 (3.2)
Jordan	427 (5.3)	426 (5.3)	429 (5.3)	426 (5.3)	427 (5.3)	426 (5.2)	429 (5.3)	427 (5.3)	427 (5.3)	427 (5.3)	427 (5.3)
Oman	421 (4.0)	421 (4.0)	423 (4.1)	421 (4.0)	421 (4.0)	421 (4.0)	424 (4.0)	421 (4.0)	421 (4.0)	421 (4.0)	421 (4.0)
Saudi Arabia	420 (4.2)	418 (4.2)	421 (4.2)	419 (4.1)	419 (4.2)	419 (4.1)	420 (4.2)	420 (4.2)	420 (4.2)	420 (4.2)	419 (4.2)
Brazil	400 (3.4)	400 (3.4)	401 (3.4)	400 (3.4)	400 (3.4)	400 (3.4)	398 (3.5)	400 (3.4)	400 (3.4)	400 (3.4)	400 (3.4)
International Average	512 (0.4)	512 (0.4)	512 (0.4)	511 (0.4)	512 (0.4)	512 (0.4)	512 (0.4)	512 (0.4)	512 (0.4)	512 (0.4)	511 (0.4)
Benchmarking Participants											
Dubai, UAE	557 (1.6)	556 (1.6)	558 (1.6)	556 (1.6)	557 (1.5)	556 (1.6)	557 (1.6)	557 (1.6)	557 (1.6)	557 (1.6)	557 (1.5)
Quebec, Canada	515 (2.7)	513 (2.7)	515 (2.8)	515 (2.7)	515 (2.7)	514 (2.7)	513 (2.7)	515 (2.7)	515 (2.7)	515 (2.7)	515 (2.7)
Sharjah, UAE	504 (3.3)	503 (3.3)	504 (3.3)	504 (3.3)	504 (3.3)	503 (3.2)	504 (3.3)	504 (3.3)	504 (3.3)	504 (3.3)	504 (3.3)
Ontario, Canada	503 (3.4)	504 (3.3)	504 (3.5)	503 (3.4)	503 (3.4)	503 (3.4)	505 (3.4)	503 (3.4)	503 (3.4)	503 (3.4)	503 (3.4)
Abu Dhabi, UAE	459 (1.9)	458 (2.0)	459 (2.0)	458 (1.9)	459 (1.9)	458 (1.9)	460 (2.0)	459 (1.9)	459 (1.9)	459 (1.9)	458 (1.9)
Number of Items (Score Points)*	183 (192)	163 (171)	149 (156)	182 (191)	183 (192)	175 (184)	145 (152)	183 (192)	183 (192)	183 (192)	179 (188)

* The number of items and score points are based on the number of items included in scaling the fourth-grade mathematics achievement data.

See Chapter 9 in *TIMSS 2023 Technical Report (Methods and Procedures)* for information about items deleted or recoded for scaling.

() Standard errors appear in parentheses. Because of rounding some results may appear inconsistent.

SOURCE: IEA's Trends in International Mathematics and Science Study - TIMSS 2023
Downloaded from <https://timss2023.org/results>

Exhibit C.1: Average Scale Scores for the Mathematics Test-Curriculum Matching Analysis

Results based on items identified by each country as addressed in its curriculum

(Continued)

Country	Average Mathematics Scale Score based on All Items	Brazil	Benchmarking Participants	Dubai, UAE	Quebec, Canada	Sharjah, UAE	Ontario, Canada	Abu Dhabi, UAE
Singapore	615 (2.9)	617 (2.9)		615 (2.9)	616 (2.9)	615 (2.9)	615 (2.9)	615 (2.9)
Chinese Taipei	607 (1.7)	609 (1.7)		607 (1.7)	606 (1.8)	607 (1.7)	602 (1.7)	607 (1.7)
Hong Kong SAR	594 (4.0)	597 (3.9)		594 (4.0)	594 (4.0)	594 (4.0)	592 (4.1)	594 (4.0)
Korea, Rep. of	594 (2.6)	597 (2.6)		594 (2.6)	595 (2.6)	594 (2.6)	596 (2.6)	594 (2.6)
Japan	591 (2.3)	592 (2.3)		591 (2.3)	590 (2.3)	591 (2.3)	586 (2.4)	591 (2.3)
Macao SAR	582 (1.0)	584 (1.1)		582 (1.0)	583 (1.0)	582 (1.0)	581 (1.1)	582 (1.0)
Lithuania	561 (2.9)	561 (2.9)		561 (2.9)	560 (2.9)	561 (2.9)	562 (3.0)	561 (2.9)
Türkiye (5)	553 (4.1)	553 (4.2)		553 (4.1)	553 (4.1)	553 (4.1)	554 (4.1)	553 (4.1)
England	552 (2.7)	552 (2.7)		552 (2.7)	553 (2.7)	552 (2.7)	554 (2.8)	552 (2.7)
Ireland	546 (2.9)	546 (3.0)		546 (2.9)	546 (2.9)	546 (2.9)	547 (3.0)	546 (2.9)
Poland	546 (2.0)	546 (2.1)		546 (2.0)	546 (2.1)	546 (2.0)	549 (2.0)	546 (2.0)
Romania	542 (4.8)	541 (4.9)		542 (4.8)	541 (4.8)	542 (4.8)	544 (4.9)	542 (4.8)
Netherlands	537 (2.0)	539 (2.0)		537 (2.0)	537 (2.0)	537 (2.0)	537 (2.0)	537 (2.0)
Latvia	534 (2.8)	535 (2.8)		534 (2.8)	534 (2.8)	534 (2.8)	537 (2.9)	534 (2.8)
Norway (5)	531 (2.0)	532 (2.0)		531 (2.0)	531 (2.0)	531 (2.0)	532 (2.1)	531 (2.0)
Czech Republic	530 (2.2)	530 (2.2)		530 (2.2)	530 (2.2)	530 (2.2)	532 (2.2)	530 (2.2)
Sweden	530 (2.8)	530 (2.8)		530 (2.8)	530 (2.8)	530 (2.8)	532 (2.9)	530 (2.8)
Finland	529 (2.5)	530 (2.5)		529 (2.5)	529 (2.5)	529 (2.5)	530 (2.6)	529 (2.5)
Australia	525 (2.6)	527 (2.6)		525 (2.6)	526 (2.6)	525 (2.6)	528 (2.5)	525 (2.6)
Denmark	524 (2.1)	526 (2.1)		524 (2.1)	524 (2.1)	524 (2.1)	522 (2.1)	524 (2.1)
Germany	524 (2.1)	525 (2.2)		524 (2.1)	524 (2.2)	524 (2.1)	525 (2.2)	524 (2.1)
Serbia	523 (3.3)	523 (3.3)		523 (3.3)	522 (3.3)	523 (3.3)	525 (3.4)	523 (3.3)
Belgium (Flemish)	521 (2.4)	521 (2.4)		521 (2.4)	521 (2.4)	521 (2.4)	519 (2.5)	521 (2.4)
Hungary	520 (3.6)	519 (3.6)		520 (3.6)	521 (3.7)	520 (3.6)	525 (3.7)	520 (3.6)
Portugal	517 (2.8)	519 (2.8)		517 (2.8)	518 (2.8)	517 (2.8)	519 (2.8)	517 (2.8)
United States	517 (3.1)	517 (3.1)		517 (3.1)	517 (3.1)	517 (3.1)	518 (3.1)	517 (3.1)
Slovak Republic	515 (3.1)	513 (3.2)		515 (3.1)	516 (3.1)	515 (3.1)	518 (3.2)	515 (3.1)
Slovenia	514 (1.8)	514 (1.9)		514 (1.8)	514 (1.9)	514 (1.8)	516 (1.9)	514 (1.8)
Armenia	513 (2.8)	510 (2.8)		513 (2.8)	512 (2.8)	513 (2.8)	512 (2.8)	513 (2.8)
Italy	513 (2.8)	515 (2.8)		513 (2.8)	514 (2.8)	513 (2.8)	515 (2.8)	513 (2.8)
Albania	512 (4.9)	509 (5.1)		512 (4.9)	512 (4.9)	512 (4.9)	511 (5.0)	512 (4.9)
Canada	504 (2.0)	505 (2.0)		504 (2.0)	505 (2.0)	504 (2.0)	506 (2.1)	504 (2.0)
Georgia	498 (3.1)	498 (3.1)		498 (3.1)	498 (3.1)	498 (3.1)	498 (3.0)	498 (3.1)
Spain	498 (2.1)	499 (2.1)		498 (2.1)	498 (2.1)	498 (2.1)	498 (2.2)	498 (2.1)
United Arab Emirates	498 (1.2)	498 (1.3)		498 (1.2)	498 (1.3)	498 (1.2)	498 (1.3)	498 (1.2)
New Zealand	490 (2.6)	491 (2.7)		490 (2.6)	490 (2.6)	490 (2.6)	491 (2.7)	490 (2.6)
Belgium (French)	489 (2.4)	489 (2.4)		489 (2.4)	489 (2.5)	489 (2.4)	487 (2.4)	489 (2.4)
Kazakhstan	487 (3.6)	488 (3.6)		487 (3.6)	487 (3.7)	487 (3.6)	487 (3.7)	487 (3.6)
France	484 (2.9)	484 (2.9)		484 (2.9)	483 (2.9)	484 (2.9)	483 (2.9)	484 (2.9)
Montenegro	477 (2.1)	475 (2.1)		477 (2.1)	476 (2.1)	477 (2.1)	477 (2.2)	477 (2.1)
North Macedonia	474 (3.6)	472 (3.6)		474 (3.6)	473 (3.6)	474 (3.6)	472 (3.7)	474 (3.6)
Qatar	464 (3.5)	465 (3.4)		464 (3.5)	464 (3.5)	464 (3.5)	464 (3.5)	464 (3.5)
Bahrain	462 (4.1)	461 (4.2)		462 (4.1)	461 (4.2)	462 (4.1)	461 (4.2)	462 (4.1)
Kosovo	451 (3.4)	450 (3.5)		451 (3.4)	451 (3.4)	451 (3.4)	452 (3.4)	451 (3.4)
Bosnia & Herzegovina	447 (3.2)	447 (3.3)		447 (3.2)	446 (3.3)	447 (3.2)	449 (3.3)	447 (3.2)
Chile	444 (2.8)	444 (2.9)		444 (2.8)	444 (2.8)	444 (2.8)	445 (2.9)	444 (2.8)
Uzbekistan	443 (3.2)	443 (3.3)		443 (3.2)	443 (3.2)	443 (3.2)	443 (3.2)	443 (3.2)
Jordan	427 (5.3)	424 (5.3)		427 (5.3)	426 (5.3)	427 (5.3)	426 (5.1)	427 (5.3)
Oman	421 (4.0)	418 (4.1)		421 (4.0)	421 (4.0)	421 (4.0)	421 (4.0)	421 (4.0)
Saudi Arabia	420 (4.2)	416 (4.2)		420 (4.2)	418 (4.2)	420 (4.2)	418 (4.2)	420 (4.2)
Brazil	400 (3.4)	401 (3.5)		400 (3.4)	400 (3.4)	400 (3.4)	400 (3.5)	400 (3.4)
International Average	512 (0.4)	512 (0.4)		512 (0.4)	511 (0.4)	512 (0.4)	512 (0.4)	512 (0.4)
Benchmarking Participants								
Dubai, UAE	557 (1.6)	557 (1.6)		557 (1.6)	557 (1.6)	557 (1.6)	557 (1.6)	557 (1.6)
Quebec, Canada	515 (2.7)	516 (2.7)		515 (2.7)	516 (2.8)	515 (2.7)	515 (2.7)	515 (2.7)
Sharjah, UAE	504 (3.3)	503 (3.3)		504 (3.3)	504 (3.3)	504 (3.3)	503 (3.3)	504 (3.3)
Ontario, Canada	503 (3.4)	503 (3.4)		503 (3.4)	504 (3.4)	503 (3.4)	505 (3.5)	503 (3.4)
Abu Dhabi, UAE	459 (1.9)	458 (2.0)		459 (1.9)	459 (2.0)	459 (1.9)	459 (2.0)	459 (1.9)
Number of Items (Score Points)*	183 (192)	142 (150)		183 (192)	168 (177)	183 (192)	143 (150)	183 (192)

* The number of items and score points are based on the number of items included in scaling the fourth-grade mathematics achievement data.

 See Chapter 9 in *TIMSS 2023 Technical Report (Methods and Procedures)* for information about items deleted or recoded for scaling.

() Standard errors appear in parentheses. Because of rounding some results may appear inconsistent.

 SOURCE: IEA's Trends in International Mathematics and Science Study - TIMSS 2023
 Downloaded from <https://timss2023.org/results>

Exhibit C.2: Average Scale Scores for the Science Test-Curriculum Matching Analysis

Results based on items identified by each country as addressed in its curriculum

Read down the column under a country name to compare achievement scores based on the items identified by that country. Scores on the diagonal are countries' achievement scores based on the test items they identified.

Country	Average Science Scale Score based on All Items	Singapore	Korea, Rep. of	Chinese Taipei	Türkiye (5)	England	Japan	Australia	Poland	Hong Kong SAR	Finland
Singapore	607 (2.8)	681 (3.1)	617 (2.7)	625 (2.8)	622 (2.7)	620 (2.8)	646 (2.8)	610 (2.6)	616 (2.9)	615 (2.8)	610 (2.7)
Korea, Rep. of	583 (2.5)	602 (2.5)	605 (2.4)	599 (2.5)	597 (2.6)	584 (2.5)	607 (2.6)	591 (2.5)	586 (2.5)	582 (2.6)	584 (2.6)
Chinese Taipei	573 (1.7)	591 (2.0)	585 (1.7)	589 (1.6)	579 (1.8)	576 (1.8)	610 (2.0)	570 (1.8)	571 (1.7)	574 (1.8)	577 (1.8)
Türkiye (5)	570 (3.4)	585 (3.2)	571 (3.1)	569 (3.2)	583 (3.4)	582 (3.5)	593 (3.3)	575 (3.4)	570 (3.4)	572 (3.4)	575 (3.5)
England	556 (2.6)	570 (2.5)	564 (2.5)	561 (2.4)	565 (2.5)	562 (2.5)	572 (2.5)	561 (2.5)	561 (2.6)	566 (2.7)	563 (2.6)
Japan	555 (2.4)	586 (2.3)	573 (2.3)	572 (2.3)	557 (2.3)	562 (2.4)	585 (2.2)	560 (2.4)	557 (2.5)	548 (2.6)	550 (2.4)
Australia	550 (2.3)	564 (2.0)	558 (2.1)	551 (2.3)	558 (2.3)	553 (2.2)	560 (2.1)	556 (2.2)	554 (2.3)	559 (2.3)	555 (2.3)
Poland	550 (2.2)	562 (2.9)	558 (2.4)	554 (2.4)	558 (2.4)	550 (2.4)	558 (3.1)	557 (2.4)	558 (2.4)	554 (2.4)	555 (2.4)
Hong Kong SAR	545 (3.8)	570 (3.9)	553 (3.6)	552 (3.9)	551 (3.9)	548 (3.9)	567 (3.5)	546 (3.9)	551 (3.9)	555 (4.0)	555 (3.8)
Finland	542 (2.9)	547 (2.9)	552 (3.0)	548 (2.8)	547 (2.9)	542 (2.9)	549 (2.9)	549 (3.0)	548 (3.0)	548 (3.0)	554 (3.0)
Lithuania	537 (2.9)	553 (3.0)	542 (2.8)	546 (2.9)	546 (3.0)	543 (2.9)	556 (2.9)	542 (2.9)	542 (3.0)	536 (2.9)	542 (3.0)
Macao SAR	536 (1.4)	562 (1.0)	545 (1.2)	544 (1.3)	545 (1.3)	542 (1.3)	561 (1.1)	536 (1.3)	540 (1.3)	544 (1.3)	545 (1.3)
Sweden	533 (3.2)	543 (3.2)	540 (3.3)	539 (3.2)	541 (3.2)	536 (3.2)	539 (3.6)	540 (3.1)	536 (3.3)	534 (3.4)	539 (3.4)
Ireland	532 (3.2)	546 (3.1)	542 (3.1)	538 (3.1)	539 (3.3)	532 (3.2)	540 (3.1)	537 (3.3)	537 (3.4)	542 (3.5)	539 (3.3)
United States	532 (2.8)	548 (2.7)	538 (2.8)	534 (2.7)	535 (2.8)	534 (2.8)	545 (2.7)	538 (2.8)	536 (2.8)	541 (2.9)	536 (2.8)
Norway (5)	530 (2.6)	531 (2.6)	540 (2.6)	534 (2.6)	538 (2.7)	531 (2.6)	528 (2.7)	539 (2.5)	532 (2.6)	537 (2.6)	533 (2.7)
Czech Republic	526 (2.3)	548 (2.3)	536 (2.4)	526 (2.3)	535 (2.3)	534 (2.4)	541 (2.4)	534 (2.4)	530 (2.4)	529 (2.4)	535 (2.3)
Latvia	526 (3.0)	545 (2.7)	534 (3.0)	531 (2.9)	536 (2.9)	536 (2.9)	544 (2.5)	534 (3.1)	526 (3.1)	525 (3.0)	527 (3.1)
Romania	526 (4.8)	539 (4.5)	531 (4.8)	530 (4.7)	536 (4.8)	531 (4.6)	547 (5.0)	529 (5.0)	531 (4.9)	530 (4.9)	531 (5.1)
Slovenia	526 (2.3)	546 (2.8)	539 (2.5)	534 (2.4)	538 (2.6)	532 (2.5)	554 (2.8)	533 (2.5)	530 (2.4)	529 (2.5)	530 (2.5)
Hungary	524 (3.2)	540 (3.2)	536 (3.2)	526 (3.2)	530 (3.2)	528 (3.3)	531 (3.4)	530 (3.4)	532 (3.3)	532 (3.3)	533 (3.3)
Denmark	522 (2.6)	518 (2.9)	525 (2.8)	526 (2.6)	522 (2.7)	520 (2.6)	517 (3.0)	524 (2.6)	529 (2.6)	526 (2.7)	526 (2.7)
Canada	521 (2.0)	538 (1.9)	528 (2.0)	525 (2.1)	530 (2.1)	522 (2.0)	530 (2.1)	525 (2.1)	525 (2.0)	527 (2.1)	528 (2.1)
Slovak Republic	521 (3.3)	542 (3.3)	525 (3.4)	524 (3.3)	531 (3.3)	531 (3.3)	536 (3.5)	529 (3.4)	522 (3.1)	522 (3.1)	528 (3.3)
Netherlands	517 (2.9)	517 (3.9)	522 (3.3)	522 (3.1)	521 (3.2)	521 (3.2)	522 (3.9)	528 (3.2)	516 (3.2)	519 (3.2)	521 (3.2)
New Zealand	517 (2.8)	535 (3.3)	526 (3.1)	522 (3.1)	524 (3.1)	520 (3.0)	532 (3.5)	521 (3.1)	521 (3.1)	524 (3.1)	524 (3.1)
Germany	515 (2.8)	528 (3.1)	523 (3.0)	522 (2.9)	522 (3.0)	520 (2.9)	528 (3.3)	519 (3.0)	519 (3.0)	518 (3.0)	517 (3.0)
Italy	511 (2.5)	529 (2.2)	520 (2.4)	514 (2.4)	520 (2.4)	511 (2.4)	526 (2.6)	514 (2.6)	517 (2.5)	521 (2.7)	518 (2.6)
Portugal	511 (2.3)	525 (2.1)	515 (2.2)	513 (2.3)	523 (2.3)	513 (2.3)	527 (2.1)	516 (2.4)	513 (2.3)	518 (2.3)	516 (2.4)
Serbia	510 (3.2)	530 (3.6)	522 (3.2)	518 (3.4)	516 (3.3)	514 (3.3)	534 (3.6)	514 (3.4)	517 (3.3)	514 (3.3)	518 (3.2)
Spain	504 (2.1)	523 (2.5)	511 (2.2)	505 (2.2)	514 (2.3)	507 (2.2)	518 (2.6)	509 (2.3)	506 (2.1)	511 (2.2)	512 (2.2)
United Arab Emirates	495 (1.8)	516 (1.9)	501 (1.9)	497 (1.9)	500 (1.9)	499 (1.8)	517 (1.9)	497 (1.9)	490 (1.9)	501 (1.9)	503 (1.9)
Albania	491 (4.5)	512 (4.9)	497 (4.4)	492 (4.4)	498 (4.7)	494 (4.4)	518 (4.6)	495 (4.8)	494 (4.5)	498 (4.5)	494 (4.5)
Belgium (Flemish)	488 (2.6)	492 (2.7)	494 (2.7)	496 (2.6)	494 (2.6)	491 (2.6)	497 (2.9)	497 (2.6)	491 (2.7)	494 (2.7)	492 (2.7)
France	488 (3.0)	497 (3.4)	496 (3.3)	493 (3.0)	496 (3.1)	488 (3.1)	495 (3.6)	487 (3.3)	492 (3.1)	494 (3.1)	495 (3.1)
Belgium (French)	481 (2.8)	495 (3.0)	488 (3.0)	485 (2.9)	487 (3.0)	480 (2.9)	491 (3.2)	482 (2.9)	487 (2.9)	483 (3.0)	484 (2.9)
Chile	479 (2.7)	501 (3.1)	490 (2.9)	482 (2.8)	485 (2.9)	481 (2.8)	494 (3.3)	486 (2.8)	487 (2.8)	486 (2.8)	488 (2.9)
Bahrain	475 (3.9)	496 (4.4)	480 (4.0)	476 (4.1)	479 (4.2)	478 (4.0)	494 (4.2)	476 (4.1)	475 (4.1)	481 (4.2)	479 (4.1)
Qatar	472 (3.6)	491 (3.9)	478 (3.6)	479 (3.7)	479 (3.8)	475 (3.8)	497 (3.8)	473 (3.8)	473 (3.7)	480 (3.8)	477 (3.7)
Kazakhstan	467 (3.5)	486 (3.7)	472 (3.6)	469 (3.4)	467 (3.7)	475 (3.5)	494 (3.7)	469 (3.6)	467 (3.6)	466 (3.6)	463 (3.6)
Georgia	465 (3.4)	474 (3.9)	467 (3.7)	461 (3.7)	468 (3.7)	466 (3.6)	467 (4.2)	465 (3.6)	470 (3.5)	466 (3.6)	466 (3.5)
Montenegro	461 (2.0)	482 (2.1)	469 (2.1)	468 (2.1)	468 (2.0)	465 (2.0)	473 (2.2)	465 (2.1)	468 (2.1)	467 (2.1)	469 (2.0)
Armenia	457 (2.7)	466 (2.7)	455 (2.6)	454 (2.6)	453 (2.7)	457 (2.7)	448 (2.8)	450 (2.8)	464 (2.6)	459 (2.7)	454 (2.5)
Bosnia & Herzegovina	448 (3.7)	461 (4.9)	460 (3.9)	456 (3.6)	459 (4.1)	454 (3.8)	466 (4.6)	457 (4.2)	453 (4.0)	453 (3.8)	456 (3.9)
North Macedonia	439 (3.9)	451 (4.5)	444 (4.2)	443 (4.1)	444 (4.1)	440 (4.0)	453 (4.8)	437 (4.1)	446 (4.0)	442 (4.2)	444 (4.0)
Oman	433 (4.2)	447 (4.6)	438 (4.4)	438 (4.3)	436 (4.4)	436 (4.3)	451 (4.6)	432 (4.3)	433 (4.4)	433 (4.4)	429 (4.3)
Saudi Arabia	428 (4.0)	425 (4.5)	428 (4.2)	425 (4.1)	427 (4.2)	429 (4.0)	435 (4.4)	423 (4.1)	425 (4.1)	431 (4.2)	428 (3.9)
Brazil	425 (3.5)	434 (3.6)	424 (3.5)	429 (3.4)	429 (3.5)	427 (3.5)	427 (3.6)	427 (3.5)	426 (3.7)	430 (3.7)	430 (3.6)
Jordan	418 (4.9)	423 (5.4)	421 (5.2)	416 (5.0)	419 (5.2)	420 (5.0)	434 (5.1)	414 (5.2)	413 (5.0)	419 (5.0)	416 (4.9)
Uzbekistan	412 (3.5)	411 (4.2)	416 (3.7)	406 (3.5)	407 (3.7)	415 (3.6)	404 (4.4)	415 (3.7)	411 (3.7)	414 (3.6)	413 (3.6)
Kosovo	403 (3.6)	414 (4.9)	407 (4.2)	407 (4.0)	410 (4.0)	401 (3.9)	422 (4.7)	408 (3.9)	399 (4.0)	406 (3.9)	406 (3.9)
International Average	505 (0.4)	520 (0.5)	512 (0.4)	509 (0.4)	511 (0.4)	508 (0.4)	519 (0.5)	508 (0.4)	508 (0.4)	509 (0.5)	509 (0.4)
Benchmarking Participants											
Dubai, UAE	562 (1.8)	584 (2.0)	566 (1.9)	564 (1.9)	569 (1.9)	567 (1.8)	583 (2.1)	566 (1.9)	557 (1.8)	572 (1.9)	572 (1.9)
Ontario, Canada	525 (3.2)	541 (3.1)	531 (3.3)	529 (3.4)	533 (3.3)	525 (3.2)	531 (3.4)	530 (3.3)	530 (3.3)	532 (3.4)	532 (3.4)
Quebec, Canada	508 (2.7)	524 (2.7)	514 (2.8)	512 (2.7)	517 (2.7)	508 (2.7)	521 (2.9)	510 (2.8)	511 (2.7)	511 (2.7)	517 (2.7)
Sharjah, UAE	503 (3.9)	524 (4.0)	510 (3.9)	504 (4.0)	507 (4.0)	508 (3.9)	528 (4.1)	502 (3.8)	499 (3.9)	509 (4.1)	511 (4.1)
Abu Dhabi, UAE	446 (2.6)	466 (3.0)	452 (2.8)	449 (2.8)	450 (2.8)	449 (2.7)	467 (3.1)	449 (2.8)	442 (2.8)	451 (2.8)	454 (2.8)
Number of Items (Score Points)*	173 (185)	41 (46)	79 (84)	99 (107)	88 (92)	111 (119)	40 (41)	99 (104)	95 (105)	109 (116)	105 (112)

* The number of items and score points are based on the number of items included in scaling the fourth-grade science achievement data.

See Chapter 9 in TIMSS 2023 Technical Report (Methods and Procedures) for information about items deleted or recoded for scaling.

() Standard errors appear in parentheses. Because of rounding some results may appear inconsistent.

SOURCE: IEA's Trends in International Mathematics and Science Study - TIMSS 2023
Downloaded from <https://timss2023.org/results>

Exhibit C.2: Average Scale Scores for the Science Test-Curriculum Matching Analysis

Results based on items identified by each country as addressed in its curriculum

(Continued)

Country	Average Science Scale Score based on All Items	Lithuania	Macao SAR	Sweden	Ireland	United States	Norway (5)	Czech Republic	Latvia	Romania	Slovenia
Singapore	607 (2.8)	608 (2.7)	626 (2.8)	608 (2.7)	610 (2.7)	613 (2.7)	612 (2.8)	607 (2.7)	612 (2.8)	607 (2.8)	613 (2.8)
Korea, Rep. of	583 (2.5)	584 (2.5)	591 (2.4)	584 (2.5)	584 (2.5)	586 (2.5)	582 (2.5)	586 (2.5)	584 (2.5)	583 (2.5)	585 (2.5)
Chinese Taipei	573 (1.7)	574 (1.7)	577 (1.6)	574 (1.7)	574 (1.7)	574 (1.7)	571 (1.7)	574 (1.7)	575 (1.7)	573 (1.7)	573 (1.7)
Türkiye (5)	570 (3.4)	570 (3.4)	569 (3.3)	571 (3.4)	571 (3.4)	566 (3.4)	568 (3.4)	567 (3.2)	572 (3.4)	570 (3.4)	574 (3.4)
England	556 (2.6)	557 (2.6)	557 (2.6)	557 (2.6)	558 (2.5)	556 (2.6)	557 (2.7)	560 (2.6)	557 (2.6)	556 (2.6)	559 (2.6)
Japan	555 (2.4)	554 (2.4)	565 (2.5)	553 (2.4)	556 (2.4)	557 (2.4)	554 (2.4)	552 (2.5)	556 (2.4)	555 (2.4)	556 (2.4)
Australia	550 (2.3)	550 (2.3)	549 (2.2)	550 (2.3)	550 (2.3)	551 (2.3)	550 (2.3)	554 (2.3)	550 (2.3)	550 (2.3)	551 (2.3)
Poland	550 (2.2)	551 (2.2)	549 (2.3)	551 (2.2)	551 (2.2)	550 (2.2)	553 (2.3)	555 (2.3)	551 (2.2)	550 (2.2)	552 (2.3)
Hong Kong SAR	545 (3.8)	547 (3.9)	552 (3.9)	547 (3.9)	548 (3.9)	546 (3.8)	548 (3.8)	548 (3.8)	547 (3.9)	545 (3.8)	549 (3.9)
Finland	542 (2.9)	543 (2.9)	547 (3.0)	543 (2.9)	543 (2.9)	543 (3.0)	545 (3.0)	545 (2.9)	542 (2.9)	542 (2.9)	542 (2.9)
Lithuania	537 (2.9)	537 (2.9)	540 (2.9)	538 (2.9)	537 (2.9)	537 (2.9)	537 (3.0)	538 (3.0)	539 (2.9)	537 (2.9)	540 (2.9)
Macao SAR	536 (1.4)	537 (1.4)	542 (1.3)	537 (1.4)	538 (1.4)	535 (1.4)	538 (1.4)	541 (1.4)	539 (1.4)	536 (1.4)	540 (1.4)
Sweden	533 (3.2)	534 (3.2)	536 (3.4)	534 (3.3)	533 (3.2)	535 (3.3)	535 (3.3)	537 (3.2)	535 (3.2)	533 (3.2)	536 (3.3)
Ireland	532 (3.2)	533 (3.2)	535 (3.2)	533 (3.2)	533 (3.2)	533 (3.2)	533 (3.3)	536 (3.4)	532 (3.2)	532 (3.2)	533 (3.3)
United States	532 (2.8)	533 (2.8)	533 (2.8)	533 (2.8)	534 (2.8)	536 (2.8)	533 (2.8)	536 (2.8)	533 (2.8)	532 (2.8)	532 (2.8)
Norway (5)	530 (2.6)	531 (2.5)	531 (2.6)	530 (2.6)	529 (2.6)	530 (2.5)	533 (2.6)	534 (2.6)	530 (2.6)	530 (2.6)	532 (2.6)
Czech Republic	526 (2.3)	527 (2.3)	529 (2.3)	527 (2.3)	527 (2.3)	527 (2.4)	527 (2.3)	532 (2.4)	528 (2.4)	526 (2.3)	528 (2.4)
Latvia	526 (3.0)	526 (3.0)	528 (3.0)	527 (3.0)	526 (2.9)	526 (3.0)	525 (3.1)	525 (3.1)	528 (3.0)	526 (3.0)	529 (3.0)
Romania	526 (4.8)	527 (4.8)	529 (4.8)	528 (4.8)	526 (4.8)	528 (4.8)	528 (4.9)	529 (4.9)	526 (4.8)	526 (4.8)	529 (4.8)
Slovenia	526 (2.3)	527 (2.4)	532 (2.4)	526 (2.3)	528 (2.4)	528 (2.4)	525 (2.4)	528 (2.4)	527 (2.4)	526 (2.3)	530 (2.4)
Hungary	524 (3.2)	525 (3.2)	530 (3.3)	524 (3.2)	524 (3.2)	527 (3.2)	528 (3.3)	529 (3.3)	525 (3.2)	524 (3.2)	524 (3.2)
Denmark	522 (2.6)	525 (2.6)	523 (2.7)	524 (2.6)	522 (2.6)	523 (2.6)	526 (2.6)	526 (2.6)	522 (2.5)	522 (2.6)	521 (2.6)
Canada	521 (2.0)	522 (2.0)	521 (2.1)	521 (2.0)	522 (2.0)	523 (2.1)	522 (2.0)	525 (2.1)	522 (2.0)	521 (2.0)	521 (2.0)
Slovak Republic	521 (3.3)	521 (3.3)	520 (3.2)	521 (3.3)	523 (3.4)	520 (3.3)	521 (3.3)	526 (3.4)	523 (3.3)	521 (3.3)	523 (3.3)
Netherlands	517 (2.9)	519 (2.9)	520 (3.1)	517 (2.9)	518 (3.0)	518 (2.9)	517 (3.0)	520 (3.0)	518 (2.9)	517 (2.9)	518 (3.0)
New Zealand	517 (2.8)	517 (2.9)	518 (3.0)	518 (2.9)	518 (2.9)	519 (2.9)	518 (3.0)	522 (3.0)	518 (2.9)	517 (2.8)	518 (2.9)
Germany	515 (2.8)	517 (2.8)	520 (2.9)	516 (2.8)	517 (2.8)	517 (2.8)	516 (2.9)	517 (2.9)	516 (2.8)	515 (2.8)	518 (2.8)
Italy	511 (2.5)	511 (2.5)	516 (2.4)	512 (2.5)	511 (2.5)	513 (2.5)	513 (2.5)	515 (2.6)	512 (2.5)	511 (2.5)	512 (2.5)
Portugal	511 (2.3)	511 (2.3)	513 (2.2)	511 (2.3)	512 (2.3)	510 (2.3)	513 (2.3)	515 (2.3)	512 (2.3)	511 (2.3)	511 (2.3)
Serbia	510 (3.2)	511 (3.2)	517 (3.2)	510 (3.2)	512 (3.3)	511 (3.2)	513 (3.2)	513 (3.2)	510 (3.3)	510 (3.2)	512 (3.3)
Spain	504 (2.1)	504 (2.1)	509 (2.1)	504 (2.1)	505 (2.1)	505 (2.1)	506 (2.1)	508 (2.1)	505 (2.1)	504 (2.1)	506 (2.1)
United Arab Emirates	495 (1.8)	495 (1.8)	496 (1.9)	495 (1.8)	497 (1.8)	494 (1.8)	494 (1.8)	496 (1.8)	495 (1.8)	495 (1.8)	494 (1.9)
Albania	491 (4.5)	490 (4.6)	498 (4.4)	491 (4.6)	491 (4.6)	490 (4.5)	491 (4.5)	491 (4.6)	490 (4.6)	491 (4.5)	493 (4.6)
Belgium (Flemish)	488 (2.6)	490 (2.6)	491 (2.6)	488 (2.6)	490 (2.6)	490 (2.6)	489 (2.6)	492 (2.6)	489 (2.6)	488 (2.6)	490 (2.6)
France	488 (3.0)	489 (3.0)	490 (3.1)	488 (3.0)	489 (3.0)	487 (3.1)	491 (3.0)	490 (3.1)	488 (3.0)	488 (3.0)	488 (3.0)
Belgium (French)	481 (2.8)	482 (2.8)	486 (2.9)	481 (2.8)	483 (2.8)	483 (2.8)	483 (2.9)	482 (2.9)	482 (2.8)	481 (2.8)	482 (2.8)
Chile	479 (2.7)	479 (2.7)	482 (2.8)	480 (2.7)	480 (2.7)	480 (2.7)	483 (2.7)	488 (2.8)	479 (2.7)	479 (2.7)	480 (2.8)
Bahrain	475 (3.9)	475 (3.9)	475 (4.1)	476 (4.0)	477 (4.0)	472 (4.0)	475 (4.0)	479 (4.0)	476 (3.9)	475 (3.9)	475 (4.0)
Qatar	472 (3.6)	473 (3.7)	477 (3.6)	474 (3.6)	474 (3.7)	473 (3.6)	473 (3.6)	475 (3.7)	474 (3.6)	472 (3.6)	475 (3.7)
Kazakhstan	467 (3.5)	467 (3.5)	466 (3.6)	467 (3.5)	467 (3.5)	465 (3.5)	465 (3.6)	467 (3.6)	466 (3.5)	467 (3.5)	466 (3.5)
Georgia	465 (3.4)	464 (3.5)	467 (3.5)	465 (3.5)	464 (3.5)	465 (3.5)	466 (3.4)	466 (3.5)	465 (3.4)	465 (3.4)	467 (3.4)
Montenegro	461 (2.0)	462 (2.0)	469 (2.0)	461 (2.0)	462 (2.0)	462 (2.0)	465 (2.0)	462 (2.0)	461 (2.0)	461 (2.0)	463 (2.0)
Armenia	457 (2.7)	457 (2.7)	459 (2.6)	457 (2.7)	456 (2.7)	455 (2.7)	458 (2.7)	455 (2.7)	456 (2.7)	457 (2.7)	458 (2.7)
Bosnia & Herzegovina	448 (3.7)	448 (3.8)	453 (3.7)	449 (3.7)	449 (3.8)	448 (3.8)	449 (3.9)	448 (3.9)	448 (3.8)	448 (3.7)	451 (3.8)
North Macedonia	439 (3.9)	439 (4.0)	445 (4.1)	439 (4.0)	438 (4.1)	439 (4.0)	441 (4.0)	439 (4.0)	438 (4.0)	439 (3.9)	440 (4.0)
Oman	433 (4.2)	432 (4.2)	436 (4.4)	434 (4.3)	434 (4.3)	433 (4.2)	433 (4.2)	431 (4.2)	433 (4.3)	433 (4.2)	434 (4.3)
Saudi Arabia	428 (4.0)	427 (3.9)	426 (4.2)	428 (4.0)	427 (4.1)	426 (4.0)	426 (4.0)	428 (4.0)	427 (4.0)	428 (4.0)	427 (4.0)
Brazil	425 (3.5)	426 (3.5)	425 (3.4)	426 (3.5)	425 (3.5)	424 (3.5)	426 (3.6)	427 (3.7)	426 (3.6)	425 (3.5)	426 (3.5)
Jordan	418 (4.9)	417 (4.9)	415 (5.2)	418 (4.9)	419 (5.0)	416 (4.9)	414 (4.9)	417 (4.9)	418 (4.9)	418 (4.9)	419 (5.0)
Uzbekistan	412 (3.5)	412 (3.5)	406 (3.6)	413 (3.5)	410 (3.6)	409 (3.5)	412 (3.5)	410 (3.6)	411 (3.5)	412 (3.5)	409 (3.6)
Kosovo	403 (3.6)	403 (3.7)	410 (3.9)	403 (3.7)	404 (3.7)	404 (3.7)	403 (3.8)	400 (3.9)	403 (3.7)	403 (3.6)	404 (3.8)
International Average	505 (0.4)	505 (0.4)	508 (0.4)	505 (0.4)	505 (0.4)	505 (0.4)	506 (0.4)	507 (0.4)	505 (0.4)	505 (0.4)	506 (0.4)
Benchmarking Participants											
Dubai, UAE	562 (1.8)	562 (1.8)	563 (1.9)	562 (1.8)	565 (1.8)	560 (1.8)	561 (1.8)	565 (1.8)	563 (1.8)	562 (1.8)	563 (1.8)
Ontario, Canada	525 (3.2)	526 (3.2)	524 (3.3)	526 (3.3)	526 (3.2)	528 (3.3)	525 (3.3)	530 (3.3)	527 (3.3)	525 (3.2)	525 (3.3)
Quebec, Canada	508 (2.7)	509 (2.7)	509 (2.7)	508 (2.8)	508 (2.7)	508 (2.7)	510 (2.7)	511 (2.8)	509 (2.7)	508 (2.7)	507 (2.7)
Sharjah, UAE	503 (3.9)	503 (3.9)	505 (4.1)	503 (3.9)	505 (4.0)	501 (3.9)	501 (3.9)	505 (3.9)	503 (3.9)	503 (3.9)	502 (3.9)
Abu Dhabi, UAE	446 (2.6)	447 (2.6)	446 (2.8)	446 (2.7)	447 (2.7)	446 (2.7)	445 (2.7)	447 (2.7)	446 (2.6)	446 (2.6)	445 (2.7)
Number of Items (Score Points)*	173 (185)	160 (171)	115 (124)	162 (173)	151 (162)	147 (157)	140 (151)	123 (133)	158 (170)	173 (185)	140 (151)

* The number of items and score points are based on the number of items included in scaling the fourth-grade science achievement data.

See Chapter 9 in *TIMSS 2023 Technical Report (Methods and Procedures)* for information about items deleted or recoded for scaling.

() Standard errors appear in parentheses. Because of rounding some results may appear inconsistent.

SOURCE: IEA's Trends in International Mathematics and Science Study - TIMSS 2023
Downloaded from <https://timss2023.org/results>

Exhibit C.2: Average Scale Scores for the Science Test-Curriculum Matching Analysis

Results based on items identified by each country as addressed in its curriculum

(Continued)

Country	Average Science Scale Score based on All Items	Hungary	Denmark	Canada	Slovak Republic	Netherlands	New Zealand	Germany	Italy	Portugal	Serbia
Singapore	607 (2.8)	615 (2.7)	606 (2.7)	624 (2.7)	608 (2.7)	610 (2.8)	616 (2.8)	612 (2.8)	611 (2.8)	610 (2.8)	611 (2.8)
Korea, Rep. of	583 (2.5)	585 (2.5)	584 (2.5)	586 (2.5)	586 (2.5)	586 (2.6)	588 (2.5)	586 (2.5)	585 (2.5)	585 (2.5)	587 (2.5)
Chinese Taipei	573 (1.7)	573 (1.7)	575 (1.7)	570 (1.8)	577 (1.7)	577 (1.7)	576 (1.7)	574 (1.7)	572 (1.7)	572 (1.8)	574 (1.7)
Türkiye (5)	570 (3.4)	570 (3.3)	567 (3.4)	571 (3.4)	581 (3.4)	574 (3.4)	573 (3.4)	566 (3.4)	564 (3.4)	569 (3.4)	568 (3.4)
England	556 (2.6)	556 (2.6)	557 (2.6)	561 (2.6)	557 (2.5)	558 (2.5)	559 (2.6)	556 (2.6)	556 (2.6)	557 (2.6)	557 (2.6)
Japan	555 (2.4)	557 (2.3)	556 (2.4)	552 (2.4)	557 (2.4)	558 (2.4)	560 (2.5)	559 (2.4)	558 (2.4)	558 (2.4)	557 (2.4)
Australia	550 (2.3)	550 (2.3)	550 (2.3)	557 (2.2)	547 (2.4)	550 (2.3)	552 (2.3)	550 (2.3)	551 (2.3)	549 (2.3)	550 (2.3)
Poland	550 (2.2)	551 (2.3)	551 (2.2)	557 (2.4)	548 (2.3)	553 (2.2)	550 (2.3)	551 (2.2)	552 (2.2)	550 (2.3)	550 (2.2)
Hong Kong SAR	545 (3.8)	547 (4.0)	545 (3.8)	549 (3.9)	550 (3.9)	549 (3.9)	547 (3.9)	546 (3.9)	546 (3.9)	547 (3.9)	548 (3.9)
Finland	542 (2.9)	544 (3.0)	542 (2.9)	545 (2.9)	545 (2.9)	545 (2.9)	544 (2.9)	544 (3.0)	544 (3.0)	546 (2.9)	543 (2.9)
Lithuania	537 (2.9)	538 (3.0)	537 (2.9)	542 (2.8)	540 (3.0)	540 (2.9)	539 (2.9)	539 (2.9)	536 (2.9)	537 (2.9)	537 (2.9)
Macao SAR	536 (1.4)	536 (1.4)	536 (1.4)	541 (1.3)	541 (1.4)	542 (1.4)	536 (1.4)	536 (1.4)	535 (1.4)	536 (1.4)	537 (1.4)
Sweden	533 (3.2)	537 (3.2)	535 (3.2)	540 (3.2)	537 (3.2)	537 (3.3)	534 (3.2)	534 (3.3)	533 (3.3)	535 (3.2)	533 (3.3)
Ireland	532 (3.2)	533 (3.3)	533 (3.2)	537 (3.2)	534 (3.3)	534 (3.3)	535 (3.2)	533 (3.2)	534 (3.2)	534 (3.2)	534 (3.2)
United States	532 (2.8)	531 (2.8)	534 (2.8)	544 (2.8)	529 (2.9)	533 (2.8)	534 (2.8)	534 (2.8)	534 (2.8)	533 (2.9)	534 (2.8)
Norway (5)	530 (2.6)	535 (2.5)	532 (2.6)	533 (2.5)	532 (2.6)	532 (2.6)	529 (2.7)	531 (2.6)	531 (2.6)	533 (2.6)	529 (2.5)
Czech Republic	526 (2.3)	527 (2.3)	527 (2.3)	539 (2.4)	524 (2.3)	530 (2.3)	526 (2.3)	527 (2.3)	528 (2.3)	527 (2.3)	527 (2.3)
Latvia	526 (3.0)	526 (3.1)	527 (3.0)	534 (3.1)	528 (3.0)	529 (3.0)	528 (3.1)	524 (3.0)	524 (3.1)	525 (3.0)	525 (3.0)
Romania	526 (4.8)	529 (4.8)	527 (4.7)	531 (4.8)	529 (4.8)	529 (4.9)	529 (5.0)	527 (4.8)	527 (4.8)	526 (4.8)	526 (4.8)
Slovenia	526 (2.3)	528 (2.4)	526 (2.4)	534 (2.5)	528 (2.4)	530 (2.4)	528 (2.4)	528 (2.4)	528 (2.4)	527 (2.4)	527 (2.4)
Hungary	524 (3.2)	529 (3.2)	526 (3.2)	531 (3.3)	524 (3.2)	528 (3.3)	524 (3.2)	526 (3.2)	529 (3.2)	527 (3.3)	525 (3.2)
Denmark	522 (2.6)	523 (2.6)	525 (2.6)	527 (2.7)	523 (2.6)	523 (2.6)	524 (2.6)	523 (2.6)	524 (2.6)	525 (2.6)	523 (2.6)
Canada	521 (2.0)	521 (2.0)	522 (2.1)	532 (2.1)	520 (2.1)	522 (2.0)	523 (2.1)	522 (2.1)	522 (2.0)	521 (2.1)	522 (2.0)
Slovak Republic	521 (3.3)	521 (3.3)	521 (3.3)	529 (3.3)	522 (3.4)	525 (3.3)	523 (3.4)	520 (3.3)	521 (3.3)	521 (3.3)	520 (3.3)
Netherlands	517 (2.9)	519 (3.0)	521 (3.0)	522 (3.3)	518 (3.0)	518 (3.0)	519 (3.0)	517 (2.9)	516 (3.0)	517 (3.0)	517 (2.9)
New Zealand	517 (2.8)	519 (2.9)	519 (2.9)	524 (3.1)	517 (3.0)	517 (3.0)	520 (2.9)	518 (2.9)	518 (2.9)	517 (2.9)	517 (2.9)
Germany	515 (2.8)	518 (2.8)	516 (2.9)	520 (3.0)	517 (2.9)	518 (2.9)	517 (2.8)	517 (2.8)	517 (2.9)	516 (2.9)	516 (2.8)
Italy	511 (2.5)	512 (2.4)	510 (2.5)	518 (2.6)	510 (2.5)	514 (2.4)	515 (2.4)	512 (2.5)	514 (2.5)	511 (2.5)	513 (2.5)
Portugal	511 (2.3)	515 (2.3)	511 (2.3)	519 (2.3)	513 (2.3)	515 (2.3)	514 (2.3)	512 (2.3)	513 (2.3)	513 (2.3)	510 (2.3)
Serbia	510 (3.2)	511 (3.2)	509 (3.2)	517 (3.3)	514 (3.4)	514 (3.3)	512 (3.2)	513 (3.2)	513 (3.2)	511 (3.2)	512 (3.2)
Spain	504 (2.1)	505 (2.1)	503 (2.1)	511 (2.2)	507 (2.1)	507 (2.1)	506 (2.1)	506 (2.1)	505 (2.1)	505 (2.1)	504 (2.1)
United Arab Emirates	495 (1.8)	492 (1.9)	494 (1.8)	501 (1.8)	495 (1.9)	497 (1.8)	494 (1.8)	493 (1.9)	493 (1.9)	494 (1.8)	494 (1.8)
Albania	491 (4.5)	492 (4.4)	490 (4.5)	494 (4.7)	496 (4.8)	492 (4.5)	492 (4.5)	491 (4.5)	490 (4.5)	492 (4.4)	491 (4.6)
Belgium (Flemish)	488 (2.6)	491 (2.6)	492 (2.6)	493 (2.8)	490 (2.6)	491 (2.6)	489 (2.6)	489 (2.6)	489 (2.6)	489 (2.6)	490 (2.7)
France	488 (3.0)	490 (3.0)	487 (3.1)	491 (3.3)	487 (3.0)	491 (3.0)	489 (3.0)	488 (3.0)	489 (3.0)	488 (3.0)	488 (3.0)
Belgium (French)	481 (2.8)	483 (2.8)	480 (2.8)	486 (2.9)	482 (2.8)	484 (2.8)	483 (2.8)	482 (2.8)	483 (2.8)	481 (2.8)	482 (2.8)
Chile	479 (2.7)	482 (2.8)	481 (2.7)	493 (2.8)	478 (2.8)	482 (2.8)	481 (2.7)	481 (2.7)	484 (2.7)	482 (2.7)	479 (2.7)
Bahrain	475 (3.9)	472 (4.1)	473 (4.0)	481 (4.1)	479 (4.1)	476 (4.0)	476 (4.0)	474 (4.0)	475 (4.0)	474 (4.0)	475 (4.0)
Qatar	472 (3.6)	471 (3.6)	472 (3.6)	476 (3.7)	476 (3.7)	475 (3.7)	474 (3.7)	472 (3.6)	472 (3.5)	472 (3.6)	473 (3.6)
Kazakhstan	467 (3.5)	466 (3.5)	465 (3.5)	470 (3.7)	470 (3.6)	466 (3.6)	468 (3.5)	465 (3.5)	467 (3.5)	465 (3.5)	466 (3.5)
Georgia	465 (3.4)	465 (3.5)	464 (3.4)	466 (3.6)	465 (3.5)	465 (3.5)	465 (3.5)	464 (3.4)	467 (3.4)	465 (3.4)	465 (3.4)
Montenegro	461 (2.0)	463 (2.1)	459 (2.0)	465 (2.1)	462 (2.0)	464 (2.0)	463 (2.1)	464 (2.0)	464 (2.0)	462 (2.0)	463 (2.0)
Armenia	457 (2.7)	456 (2.7)	456 (2.7)	454 (2.8)	459 (2.7)	456 (2.7)	456 (2.7)	456 (2.7)	458 (2.7)	454 (2.6)	457 (2.7)
Bosnia & Herzegovina	448 (3.7)	451 (3.9)	447 (3.7)	451 (4.4)	451 (3.8)	452 (3.8)	450 (3.8)	450 (3.8)	449 (3.9)	450 (3.7)	449 (3.8)
North Macedonia	439 (3.9)	440 (4.0)	437 (3.9)	436 (4.2)	443 (4.0)	441 (4.0)	439 (4.0)	440 (4.0)	440 (4.0)	438 (4.0)	439 (4.0)
Oman	433 (4.2)	431 (4.3)	432 (4.3)	435 (4.3)	438 (4.3)	434 (4.2)	434 (4.2)	433 (4.2)	431 (4.2)	431 (4.2)	432 (4.2)
Saudi Arabia	428 (4.0)	421 (4.1)	427 (4.0)	421 (4.1)	431 (4.1)	427 (4.0)	428 (4.0)	425 (4.1)	425 (4.0)	424 (4.0)	427 (4.0)
Brazil	425 (3.5)	426 (3.5)	426 (3.5)	428 (3.7)	427 (3.5)	428 (3.5)	427 (3.5)	425 (3.5)	426 (3.6)	425 (3.6)	425 (3.5)
Jordan	418 (4.9)	411 (5.0)	418 (4.9)	415 (4.9)	421 (5.1)	418 (5.0)	417 (4.8)	415 (4.9)	413 (4.9)	413 (4.9)	417 (4.9)
Uzbekistan	412 (3.5)	408 (3.5)	413 (3.5)	414 (3.7)	410 (3.6)	409 (3.6)	413 (3.5)	410 (3.4)	412 (3.4)	410 (3.4)	410 (3.5)
Kosovo	403 (3.6)	405 (3.8)	400 (3.7)	395 (3.9)	411 (3.8)	405 (3.7)	403 (3.7)	405 (3.7)	401 (3.7)	405 (3.7)	404 (3.7)
International Average	505 (0.4)	505 (0.4)	505 (0.4)	509 (0.4)	507 (0.4)	507 (0.4)	506 (0.4)	505 (0.4)	505 (0.4)	505 (0.4)	505 (0.4)
Benchmarking Participants											
Dubai, UAE	562 (1.8)	560 (1.8)	561 (1.8)	569 (1.8)	564 (1.8)	564 (1.8)	562 (1.9)	560 (1.8)	560 (1.8)	563 (1.8)	561 (1.8)
Ontario, Canada	525 (3.2)	524 (3.3)	527 (3.3)	537 (3.4)	524 (3.3)	527 (3.3)	527 (3.3)	526 (3.3)	526 (3.3)	525 (3.3)	526 (3.3)
Quebec, Canada	508 (2.7)	510 (2.7)	507 (2.8)	516 (2.7)	506 (2.8)	509 (2.7)	509 (2.8)	507 (2.7)	508 (2.8)	509 (2.7)	507 (2.7)
Sharjah, UAE	503 (3.9)	500 (4.0)	500 (3.9)	510 (3.8)	503 (4.0)	505 (4.0)	502 (3.9)	500 (3.9)	501 (3.9)	501 (3.9)	502 (3.9)
Abu Dhabi, UAE	446 (2.6)	444 (2.8)	446 (2.6)	452 (2.8)	445 (2.7)	447 (2.7)	446 (2.7)	444 (2.7)	446 (2.7)	445 (2.7)	446 (2.6)
Number of Items (Score Points)*	173 (185)	133 (142)	157 (168)	94 (100)	128 (139)	150 (159)	141 (151)	153 (164)	140 (151)	152 (161)	161 (172)

* The number of items and score points are based on the number of items included in scaling the fourth-grade science achievement data.

See Chapter 9 in *TIMSS 2023 Technical Report (Methods and Procedures)* for information about items deleted or recoded for scaling.

() Standard errors appear in parentheses. Because of rounding some results may appear inconsistent.

SOURCE: IEA's Trends in International Mathematics and Science Study - TIMSS 2023
Downloaded from <https://timss2023.org/results>

Exhibit C.2: Average Scale Scores for the Science Test-Curriculum Matching Analysis

Results based on items identified by each country as addressed in its curriculum

(Continued)

Country	Average Science Scale Score based on All Items	Spain	United Arab Emirates	Albania	Belgium (Flemish)	France	Belgium (French)	Chile	Bahrain	Qatar	Kazakhstan
Singapore	607 (2.8)	611 (2.8)	607 (2.8)	618 (2.8)	630 (2.8)	613 (2.8)	613 (2.7)	607 (2.8)	607 (2.8)	623 (2.7)	607 (2.8)
Korea, Rep. of	583 (2.5)	585 (2.5)	583 (2.5)	589 (2.5)	594 (2.5)	587 (2.6)	596 (2.5)	583 (2.5)	583 (2.5)	592 (2.6)	583 (2.5)
Chinese Taipei	573 (1.7)	572 (1.7)	573 (1.7)	575 (1.7)	580 (1.7)	570 (1.7)	575 (1.8)	573 (1.7)	573 (1.7)	577 (1.8)	573 (1.7)
Türkiye (5)	570 (3.4)	572 (3.4)	570 (3.4)	572 (3.4)	575 (3.2)	577 (3.4)	575 (3.4)	570 (3.4)	570 (3.4)	569 (3.4)	570 (3.4)
England	556 (2.6)	558 (2.6)	556 (2.6)	557 (2.5)	563 (2.6)	559 (2.6)	564 (2.5)	556 (2.6)	556 (2.6)	565 (2.5)	556 (2.6)
Japan	555 (2.4)	554 (2.5)	555 (2.4)	560 (2.5)	567 (2.4)	554 (2.6)	556 (2.4)	555 (2.4)	555 (2.4)	560 (2.3)	555 (2.4)
Australia	550 (2.3)	551 (2.3)	550 (2.3)	549 (2.3)	553 (2.3)	550 (2.3)	557 (2.3)	549 (2.3)	550 (2.3)	560 (2.2)	550 (2.3)
Poland	550 (2.2)	552 (2.2)	550 (2.2)	550 (2.3)	557 (2.5)	557 (2.4)	558 (2.4)	550 (2.2)	550 (2.2)	557 (2.4)	550 (2.2)
Hong Kong SAR	545 (3.8)	547 (3.9)	545 (3.8)	550 (3.9)	549 (3.9)	550 (3.9)	549 (3.9)	545 (3.9)	545 (3.8)	555 (4.0)	545 (3.9)
Finland	542 (2.9)	543 (2.9)	542 (2.9)	543 (3.0)	550 (2.9)	547 (3.0)	556 (3.0)	542 (2.9)	542 (2.9)	552 (3.0)	542 (2.9)
Lithuania	537 (2.9)	537 (2.9)	537 (2.9)	538 (2.9)	544 (3.0)	540 (3.0)	545 (2.9)	537 (2.9)	537 (2.9)	542 (2.9)	537 (2.9)
Macao SAR	536 (1.4)	538 (1.4)	536 (1.4)	539 (1.4)	543 (1.3)	541 (1.3)	540 (1.3)	536 (1.4)	536 (1.4)	540 (1.2)	536 (1.4)
Sweden	533 (3.2)	535 (3.2)	533 (3.2)	535 (3.2)	542 (3.1)	535 (3.1)	544 (3.1)	533 (3.2)	533 (3.2)	542 (3.4)	532 (3.2)
Ireland	532 (3.2)	533 (3.2)	532 (3.2)	533 (3.2)	537 (3.2)	533 (3.2)	541 (3.2)	532 (3.2)	532 (3.2)	543 (3.4)	532 (3.2)
United States	532 (2.8)	533 (2.8)	532 (2.8)	533 (2.8)	535 (2.9)	537 (2.9)	543 (2.8)	532 (2.8)	532 (2.8)	542 (2.9)	533 (2.8)
Norway (5)	530 (2.6)	531 (2.6)	530 (2.6)	529 (2.6)	536 (2.6)	532 (2.7)	533 (2.6)	530 (2.6)	530 (2.6)	540 (2.6)	530 (2.6)
Czech Republic	526 (2.3)	528 (2.3)	526 (2.3)	526 (2.3)	535 (2.2)	534 (2.3)	537 (2.4)	526 (2.3)	526 (2.3)	532 (2.3)	526 (2.3)
Latvia	526 (3.0)	528 (3.0)	526 (3.0)	526 (3.0)	531 (3.1)	526 (3.2)	535 (2.9)	526 (3.0)	526 (3.0)	532 (3.0)	526 (3.0)
Romania	526 (4.8)	528 (4.8)	526 (4.8)	528 (4.9)	534 (4.8)	533 (5.0)	532 (4.8)	526 (4.8)	526 (4.8)	530 (5.0)	526 (4.8)
Slovenia	526 (2.3)	528 (2.4)	526 (2.3)	529 (2.4)	535 (2.5)	532 (2.5)	538 (2.6)	526 (2.3)	526 (2.3)	534 (2.5)	526 (2.3)
Hungary	524 (3.2)	526 (3.2)	524 (3.2)	527 (3.2)	528 (3.2)	530 (3.1)	535 (3.3)	524 (3.2)	524 (3.2)	531 (3.4)	524 (3.2)
Denmark	522 (2.6)	523 (2.6)	522 (2.6)	522 (2.6)	525 (2.7)	523 (2.6)	528 (2.8)	522 (2.6)	522 (2.6)	529 (2.7)	522 (2.6)
Canada	521 (2.0)	522 (2.0)	521 (2.0)	522 (2.0)	525 (2.1)	526 (2.0)	533 (2.0)	521 (2.0)	521 (2.0)	527 (2.1)	521 (2.0)
Slovak Republic	521 (3.3)	523 (3.3)	521 (3.3)	521 (3.4)	529 (3.3)	526 (3.3)	529 (3.3)	521 (3.3)	521 (3.3)	525 (3.4)	521 (3.3)
Netherlands	517 (2.9)	517 (3.0)	517 (2.9)	516 (3.0)	522 (3.3)	517 (3.2)	524 (3.2)	517 (2.9)	517 (2.9)	523 (3.2)	517 (2.9)
New Zealand	517 (2.8)	518 (2.9)	517 (2.8)	517 (2.9)	520 (3.1)	519 (3.1)	527 (3.1)	517 (2.9)	517 (2.9)	525 (3.1)	517 (2.9)
Germany	515 (2.8)	517 (2.8)	515 (2.8)	517 (2.9)	521 (2.9)	519 (3.0)	523 (3.0)	516 (2.8)	515 (2.8)	522 (3.0)	516 (2.8)
Italy	511 (2.5)	512 (2.4)	511 (2.5)	516 (2.5)	517 (2.5)	522 (2.5)	524 (2.6)	511 (2.5)	511 (2.5)	520 (2.4)	511 (2.5)
Portugal	511 (2.3)	512 (2.3)	511 (2.3)	514 (2.2)	519 (2.3)	519 (2.3)	522 (2.4)	511 (2.3)	511 (2.3)	516 (2.2)	511 (2.3)
Serbia	510 (3.2)	511 (3.2)	510 (3.2)	515 (3.3)	517 (3.4)	520 (3.2)	524 (3.4)	510 (3.2)	510 (3.2)	514 (3.4)	510 (3.2)
Spain	505 (2.1)	505 (2.1)	504 (2.1)	506 (2.1)	509 (2.2)	516 (2.2)	513 (2.2)	504 (2.1)	504 (2.1)	507 (2.2)	504 (2.1)
United Arab Emirates	495 (1.8)	495 (1.8)	495 (1.8)	495 (1.9)	495 (1.9)	504 (1.9)	500 (1.9)	495 (1.8)	495 (1.8)	496 (1.9)	495 (1.8)
Albania	491 (4.5)	492 (4.6)	491 (4.5)	495 (4.6)	494 (4.5)	499 (4.6)	492 (4.8)	491 (4.5)	491 (4.5)	494 (4.5)	491 (4.5)
Belgium (Flemish)	488 (2.6)	489 (2.7)	488 (2.6)	489 (2.6)	494 (2.7)	491 (2.7)	494 (2.8)	488 (2.6)	488 (2.6)	495 (2.7)	488 (2.6)
France	488 (3.0)	489 (3.0)	488 (3.0)	489 (3.0)	492 (3.1)	494 (3.1)	498 (3.2)	488 (3.0)	488 (3.0)	491 (3.2)	488 (3.0)
Belgium (French)	481 (2.8)	482 (2.8)	481 (2.8)	485 (2.8)	485 (3.0)	487 (2.9)	491 (2.9)	481 (2.8)	481 (2.8)	486 (3.0)	481 (2.8)
Chile	479 (2.7)	482 (2.7)	479 (2.7)	480 (2.7)	491 (2.9)	491 (2.9)	490 (2.9)	479 (2.7)	479 (2.7)	481 (2.8)	479 (2.7)
Bahrain	475 (3.9)	476 (4.0)	475 (3.9)	478 (4.0)	475 (4.2)	485 (4.1)	481 (4.1)	475 (3.9)	475 (3.9)	474 (4.1)	475 (3.9)
Qatar	472 (3.6)	473 (3.7)	472 (3.6)	475 (3.7)	475 (3.9)	476 (3.6)	479 (3.6)	472 (3.6)	472 (3.6)	478 (3.6)	472 (3.6)
Kazakhstan	467 (3.5)	466 (3.5)	467 (3.5)	465 (3.6)	461 (3.6)	470 (3.6)	471 (3.7)	466 (3.5)	466 (3.5)	465 (3.6)	467 (3.5)
Georgia	465 (3.4)	467 (3.4)	465 (3.4)	464 (3.6)	467 (3.6)	471 (3.6)	466 (3.8)	465 (3.4)	465 (3.4)	464 (3.6)	465 (3.4)
Montenegro	461 (2.0)	462 (2.0)	461 (2.0)	465 (2.0)	469 (2.1)	472 (2.1)	469 (2.1)	461 (2.0)	461 (2.0)	469 (2.1)	461 (2.0)
Armenia	457 (2.7)	458 (2.7)	457 (2.7)	458 (2.7)	455 (2.6)	459 (2.7)	453 (2.8)	457 (2.7)	457 (2.7)	454 (2.8)	457 (2.7)
Bosnia & Herzegovina	448 (3.7)	450 (3.8)	448 (3.7)	450 (3.9)	456 (4.1)	455 (4.1)	458 (4.5)	448 (3.7)	448 (3.7)	456 (4.0)	448 (3.7)
North Macedonia	439 (3.9)	439 (4.0)	439 (3.9)	441 (4.1)	440 (4.1)	444 (4.1)	439 (4.2)	439 (3.9)	439 (3.9)	441 (4.2)	439 (3.9)
Oman	433 (4.2)	432 (4.2)	433 (4.2)	434 (4.3)	432 (4.4)	439 (4.5)	438 (4.3)	433 (4.2)	433 (4.2)	431 (4.3)	433 (4.2)
Saudi Arabia	428 (4.0)	426 (4.0)	428 (4.0)	428 (4.1)	420 (4.2)	434 (4.2)	429 (4.2)	428 (4.0)	428 (4.0)	423 (4.0)	428 (4.0)
Brazil	425 (3.5)	427 (3.5)	425 (3.5)	427 (3.6)	428 (3.6)	426 (3.8)	431 (3.8)	425 (3.5)	425 (3.5)	427 (3.7)	425 (3.5)
Jordan	418 (4.9)	417 (4.8)	418 (4.9)	418 (5.0)	412 (5.0)	421 (5.3)	417 (5.1)	418 (4.9)	418 (4.9)	409 (5.0)	418 (4.9)
Uzbekistan	412 (3.5)	413 (3.5)	412 (3.5)	407 (3.6)	405 (3.7)	414 (3.7)	412 (3.8)	412 (3.5)	412 (3.5)	404 (3.6)	412 (3.5)
Kosovo	403 (3.6)	403 (3.7)	403 (3.6)	404 (3.8)	406 (4.1)	411 (4.1)	402 (4.0)	403 (3.7)	403 (3.6)	407 (4.1)	403 (3.7)
International Average	505 (0.4)	506 (0.4)	505 (0.4)	506 (0.4)	509 (0.4)	510 (0.5)	511 (0.5)	505 (0.4)	505 (0.4)	509 (0.4)	505 (0.4)
Benchmarking Participants											
Dubai, UAE	562 (1.8)	563 (1.8)	562 (1.8)	563 (1.8)	565 (1.9)	574 (1.8)	567 (1.8)	562 (1.8)	562 (1.8)	565 (1.9)	562 (1.8)
Ontario, Canada	525 (3.2)	527 (3.2)	525 (3.2)	527 (3.3)	528 (3.4)	528 (3.3)	539 (3.3)	525 (3.3)	525 (3.2)	531 (3.3)	525 (3.2)
Quebec, Canada	508 (2.7)	509 (2.7)	508 (2.7)	507 (2.7)	514 (2.7)	516 (2.7)	517 (2.7)	508 (2.7)	508 (2.7)	511 (2.7)	508 (2.7)
Sharjah, UAE	503 (3.9)	503 (3.9)	503 (3.9)	503 (4.0)	501 (4.1)	514 (4.0)	508 (3.9)	503 (4.0)	503 (3.9)	502 (3.9)	503 (3.9)
Abu Dhabi, UAE	446 (2.6)	445 (2.6)	446 (2.6)	445 (2.7)	446 (2.9)	453 (2.8)	450 (2.8)	446 (2.6)	446 (2.6)	448 (2.8)	446 (2.6)
Number of Items (Score Points)*	173 (185)	153 (164)	173 (185)	135 (146)	80 (89)	106 (115)	88 (92)	173 (185)	173 (185)	97 (101)	173 (185)

* The number of items and score points are based on the number of items included in scaling the fourth-grade science achievement data.

See Chapter 9 in *TIMSS 2023 Technical Report (Methods and Procedures)* for information about items deleted or recoded for scaling.

() Standard errors appear in parentheses. Because of rounding some results may appear inconsistent.

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Exhibit C.2: Average Scale Scores for the Science Test-Curriculum Matching Analysis

Results based on items identified by each country as addressed in its curriculum

(Continued)

Country	Average Science Scale Score based on All Items	Georgia	Montenegro	Armenia	Bosnia & Herzegovina	North Macedonia	Oman	Saudi Arabia	Brazil	Jordan	Uzbekistan
Singapore	607 (2.8)	614 (2.6)	607 (2.8)	607 (2.8)	606 (2.8)	621 (2.6)	610 (2.7)	608 (2.7)	617 (2.9)	611 (2.7)	608 (2.8)
Korea, Rep. of	583 (2.5)	589 (2.5)	581 (2.6)	583 (2.5)	585 (2.5)	586 (2.5)	585 (2.5)	584 (2.5)	584 (2.5)	590 (2.5)	583 (2.5)
Chinese Taipei	573 (1.7)	578 (1.7)	569 (1.8)	573 (1.7)	569 (1.7)	576 (1.7)	573 (1.7)	574 (1.7)	570 (1.8)	576 (1.7)	574 (1.7)
Türkiye (5)	570 (3.4)	575 (3.3)	572 (3.5)	570 (3.4)	567 (3.4)	590 (3.5)	571 (3.4)	570 (3.4)	571 (3.5)	572 (3.4)	570 (3.4)
England	556 (2.6)	558 (2.5)	557 (2.7)	556 (2.6)	560 (2.7)	565 (2.5)	557 (2.6)	556 (2.6)	562 (2.7)	558 (2.5)	558 (2.7)
Japan	555 (2.4)	559 (2.4)	552 (2.5)	555 (2.4)	553 (2.5)	551 (2.4)	556 (2.4)	556 (2.4)	556 (2.6)	560 (2.4)	554 (2.4)
Australia	550 (2.3)	552 (2.2)	551 (2.3)	550 (2.3)	554 (2.3)	554 (2.3)	550 (2.3)	549 (2.3)	553 (2.2)	550 (2.3)	551 (2.3)
Poland	550 (2.2)	552 (2.4)	551 (2.3)	550 (2.2)	551 (2.3)	551 (2.5)	549 (2.2)	550 (2.2)	554 (2.4)	553 (2.3)	551 (2.3)
Hong Kong SAR	545 (3.8)	550 (3.9)	545 (3.9)	545 (3.8)	544 (3.9)	552 (4.1)	546 (3.9)	546 (3.8)	547 (3.9)	550 (3.8)	547 (3.8)
Finland	542 (2.9)	543 (3.0)	545 (3.0)	542 (2.9)	546 (3.0)	546 (2.9)	543 (2.9)	542 (2.9)	549 (3.0)	543 (2.9)	542 (3.0)
Lithuania	537 (2.9)	538 (3.0)	538 (2.9)	537 (2.9)	535 (2.9)	545 (2.9)	536 (2.9)	538 (2.9)	542 (2.9)	539 (2.9)	536 (2.9)
Macao SAR	536 (1.4)	544 (1.3)	535 (1.4)	536 (1.4)	534 (1.4)	544 (1.3)	536 (1.4)	537 (1.4)	540 (1.3)	540 (1.4)	537 (1.4)
Sweden	533 (3.2)	541 (3.3)	535 (3.2)	533 (3.2)	534 (3.3)	536 (3.2)	534 (3.3)	533 (3.2)	539 (3.3)	532 (3.2)	534 (3.2)
Ireland	532 (3.2)	534 (3.3)	533 (3.2)	532 (3.2)	535 (3.3)	539 (3.3)	533 (3.1)	532 (3.2)	534 (3.3)	534 (3.1)	533 (3.2)
United States	532 (2.8)	534 (2.8)	533 (2.8)	532 (2.8)	536 (2.8)	539 (2.9)	533 (2.8)	533 (2.8)	538 (2.8)	533 (2.8)	534 (2.8)
Norway (5)	530 (2.6)	533 (2.7)	532 (2.6)	530 (2.6)	534 (2.6)	533 (2.7)	530 (2.5)	531 (2.6)	536 (2.6)	530 (2.6)	531 (2.6)
Czech Republic	526 (2.3)	533 (2.4)	527 (2.4)	526 (2.3)	529 (2.3)	531 (2.4)	527 (2.3)	526 (2.3)	537 (2.4)	527 (2.3)	527 (2.4)
Latvia	526 (3.0)	532 (2.9)	525 (3.1)	526 (3.0)	525 (3.0)	534 (2.8)	527 (3.0)	526 (3.0)	530 (3.1)	525 (3.0)	526 (3.0)
Romania	526 (4.8)	531 (4.8)	528 (4.8)	526 (4.8)	529 (4.8)	536 (4.9)	527 (4.7)	526 (4.8)	534 (5.0)	528 (4.8)	528 (4.8)
Slovenia	526 (2.3)	532 (2.5)	523 (2.4)	526 (2.3)	526 (2.4)	533 (2.6)	527 (2.4)	525 (2.3)	529 (2.5)	527 (2.4)	526 (2.3)
Hungary	524 (3.2)	533 (3.4)	528 (3.2)	524 (3.2)	529 (3.2)	525 (3.3)	524 (3.2)	524 (3.2)	532 (3.3)	524 (3.2)	526 (3.2)
Denmark	522 (2.6)	520 (2.7)	524 (2.6)	522 (2.6)	526 (2.7)	521 (2.6)	523 (2.6)	522 (2.6)	526 (2.7)	522 (2.5)	523 (2.6)
Canada	521 (2.0)	525 (2.1)	522 (2.0)	521 (2.0)	525 (2.1)	528 (2.1)	521 (2.0)	521 (2.1)	526 (2.0)	523 (2.0)	522 (2.0)
Slovak Republic	521 (3.3)	530 (3.4)	519 (3.2)	521 (3.3)	523 (3.3)	530 (3.4)	521 (3.3)	521 (3.3)	525 (3.3)	522 (3.3)	522 (3.3)
Netherlands	517 (2.9)	520 (3.1)	518 (3.0)	517 (2.9)	518 (3.0)	518 (3.2)	518 (2.9)	517 (2.9)	517 (3.2)	517 (2.9)	518 (2.9)
New Zealand	517 (2.8)	519 (3.0)	518 (2.9)	517 (2.8)	520 (2.9)	522 (3.0)	517 (2.9)	517 (2.8)	523 (3.1)	518 (2.9)	519 (2.9)
Germany	515 (2.8)	518 (3.0)	515 (2.9)	515 (2.8)	516 (2.9)	517 (3.0)	516 (2.8)	516 (2.8)	518 (3.0)	516 (2.9)	516 (2.8)
Italy	511 (2.5)	517 (2.5)	514 (2.5)	511 (2.5)	515 (2.5)	518 (2.5)	511 (2.4)	510 (2.5)	520 (2.5)	515 (2.5)	512 (2.5)
Portugal	511 (2.3)	515 (2.3)	512 (2.3)	511 (2.3)	513 (2.3)	518 (2.2)	510 (2.3)	511 (2.3)	518 (2.3)	513 (2.3)	512 (2.3)
Serbia	510 (3.2)	516 (3.3)	511 (3.2)	510 (3.2)	511 (3.2)	514 (3.4)	510 (3.3)	510 (3.2)	516 (3.2)	514 (3.2)	511 (3.2)
Spain	504 (2.1)	510 (2.2)	506 (2.1)	504 (2.1)	504 (2.1)	512 (2.3)	504 (2.1)	505 (2.1)	511 (2.2)	507 (2.1)	505 (2.1)
United Arab Emirates	495 (1.8)	501 (1.9)	495 (1.8)	495 (1.8)	495 (1.8)	507 (1.9)	493 (1.8)	495 (1.8)	497 (1.9)	499 (1.8)	494 (1.8)
Albania	491 (4.5)	494 (4.6)	490 (4.5)	491 (4.5)	492 (4.5)	502 (4.8)	491 (4.5)	491 (4.5)	497 (4.7)	493 (4.6)	490 (4.5)
Belgium (Flemish)	488 (2.6)	489 (2.6)	488 (2.7)	488 (2.6)	490 (2.7)	492 (2.6)	489 (2.6)	489 (2.6)	489 (2.8)	490 (2.6)	489 (2.6)
France	488 (3.0)	491 (3.2)	489 (3.0)	488 (3.0)	490 (3.1)	491 (3.1)	488 (3.0)	488 (3.0)	493 (3.1)	490 (3.0)	490 (3.0)
Belgium (French)	481 (2.8)	485 (2.9)	482 (2.8)	481 (2.8)	480 (2.9)	485 (3.0)	481 (2.8)	481 (2.8)	485 (3.0)	484 (2.8)	482 (2.8)
Chile	479 (2.7)	484 (2.8)	483 (2.7)	479 (2.7)	484 (2.7)	481 (2.9)	479 (2.7)	479 (2.7)	492 (2.8)	482 (2.7)	481 (2.7)
Bahrain	475 (3.9)	480 (4.0)	475 (4.0)	475 (3.9)	475 (4.0)	483 (4.3)	473 (4.0)	476 (3.9)	478 (4.1)	478 (4.0)	475 (3.9)
Qatar	472 (3.6)	478 (3.7)	471 (3.6)	472 (3.6)	470 (3.6)	482 (3.9)	472 (3.7)	473 (3.6)	475 (3.6)	476 (3.6)	472 (3.7)
Kazakhstan	467 (3.5)	468 (3.7)	466 (3.5)	467 (3.5)	466 (3.5)	472 (3.7)	466 (3.5)	467 (3.5)	469 (3.6)	467 (3.5)	467 (3.5)
Georgia	465 (3.4)	469 (3.7)	468 (3.4)	465 (3.4)	466 (3.5)	464 (3.9)	466 (3.4)	465 (3.4)	468 (3.6)	465 (3.5)	465 (3.5)
Montenegro	461 (2.0)	464 (2.1)	464 (2.0)	461 (2.0)	462 (2.0)	464 (2.1)	462 (2.0)	461 (2.0)	466 (2.1)	465 (2.1)	461 (2.0)
Armenia	457 (2.7)	453 (2.7)	460 (2.7)	457 (2.7)	457 (2.7)	453 (2.8)	458 (2.7)	457 (2.7)	456 (2.6)	458 (2.7)	457 (2.7)
Bosnia & Herzegovina	448 (3.7)	452 (4.0)	450 (3.8)	448 (3.7)	452 (3.6)	453 (3.8)	450 (3.7)	448 (3.7)	452 (3.9)	450 (3.8)	449 (3.7)
North Macedonia	439 (3.9)	440 (4.1)	440 (4.0)	439 (3.9)	439 (3.9)	441 (4.2)	438 (4.0)	439 (3.9)	442 (4.0)	440 (4.0)	440 (3.9)
Oman	433 (4.2)	435 (4.4)	429 (4.3)	433 (4.2)	430 (4.2)	439 (4.6)	433 (4.2)	433 (4.2)	431 (4.3)	433 (4.3)	433 (4.3)
Saudi Arabia	428 (4.0)	431 (4.1)	426 (4.0)	428 (4.0)	427 (4.0)	436 (4.3)	426 (4.0)	428 (4.0)	428 (4.1)	430 (4.0)	428 (4.0)
Brazil	425 (3.5)	428 (3.4)	427 (3.6)	425 (3.5)	427 (3.6)	426 (3.5)	425 (3.5)	425 (3.5)	429 (3.7)	427 (3.6)	426 (3.6)
Jordan	418 (4.9)	420 (5.1)	414 (5.0)	418 (4.9)	416 (4.8)	422 (5.4)	417 (4.9)	418 (4.9)	417 (4.9)	421 (5.0)	418 (4.9)
Uzbekistan	412 (3.5)	409 (3.7)	413 (3.5)	412 (3.5)	413 (3.4)	407 (3.9)	411 (3.5)	411 (3.4)	418 (3.5)	410 (3.5)	412 (3.5)
Kosovo	403 (3.6)	411 (3.9)	402 (3.7)	403 (3.6)	402 (3.6)	411 (4.0)	402 (3.7)	404 (3.7)	403 (3.9)	405 (3.7)	403 (3.7)
International Average	505 (0.4)	508 (0.4)	505 (0.4)	505 (0.4)	506 (0.4)	510 (0.5)	505 (0.4)	505 (0.4)	509 (0.4)	507 (0.4)	505 (0.4)
Benchmarking Participants											
Dubai, UAE	562 (1.8)	568 (1.9)	562 (1.8)	562 (1.8)	563 (1.8)	578 (1.9)	560 (1.8)	563 (1.8)	566 (1.9)	566 (1.8)	562 (1.8)
Ontario, Canada	525 (3.2)	528 (3.3)	525 (3.2)	525 (3.2)	529 (3.4)	531 (3.4)	525 (3.2)	525 (3.3)	529 (3.3)	527 (3.3)	527 (3.3)
Quebec, Canada	508 (2.7)	514 (2.7)	509 (2.7)	508 (2.7)	510 (2.8)	515 (2.8)	507 (2.7)	507 (2.7)	514 (2.7)	508 (2.7)	509 (2.7)
Sharjah, UAE	503 (3.9)	509 (4.0)	503 (4.0)	503 (3.9)	503 (3.9)	517 (4.2)	501 (3.9)	503 (3.9)	505 (3.9)	507 (4.0)	502 (3.9)
Abu Dhabi, UAE	446 (2.6)	453 (2.7)	446 (2.7)	446 (2.6)	445 (2.7)	455 (2.9)	444 (2.6)	447 (2.6)	448 (2.8)	449 (2.7)	445 (2.7)
Number of Items (Score Points)*	173 (185)	107 (114)	149 (159)	173 (185)	145 (154)	94 (99)	158 (170)	170 (182)	106 (114)	154 (164)	161 (172)

* The number of items and score points are based on the number of items included in scaling the fourth-grade science achievement data.

See Chapter 9 in *TIMSS 2023 Technical Report (Methods and Procedures)* for information about items deleted or recoded for scaling.

() Standard errors appear in parentheses. Because of rounding some results may appear inconsistent.

SOURCE: IEA's Trends in International Mathematics and Science Study - TIMSS 2023
Downloaded from <https://timss2023.org/results>

Exhibit C.2: Average Scale Scores for the Science Test-Curriculum Matching Analysis
Results based on items identified by each country as addressed in its curriculum

(Continued)

Country	Average Science Scale Score based on All Items	Kosovo	Benchmarking Participants	Dubai, UAE	Ontario, Canada	Quebec, Canada	Sharjah, UAE	Abu Dhabi, UAE
Singapore	607 (2.8)	621 (2.8)		607 (2.8)	614 (2.7)	608 (2.8)	607 (2.8)	607 (2.8)
Korea, Rep. of	583 (2.5)	586 (2.6)		583 (2.5)	588 (2.5)	579 (2.5)	583 (2.5)	583 (2.5)
Chinese Taipei	573 (1.7)	574 (1.9)		573 (1.7)	572 (1.8)	575 (1.7)	573 (1.7)	573 (1.7)
Türkiye (5)	570 (3.4)	580 (3.4)		570 (3.4)	571 (3.4)	578 (3.3)	570 (3.4)	570 (3.4)
England	556 (2.6)	564 (2.5)		556 (2.6)	560 (2.6)	563 (2.7)	556 (2.6)	556 (2.6)
Japan	555 (2.4)	548 (2.5)		555 (2.4)	553 (2.4)	556 (2.5)	555 (2.4)	555 (2.4)
Australia	550 (2.3)	556 (2.2)		550 (2.3)	555 (2.2)	556 (2.4)	550 (2.3)	550 (2.3)
Poland	550 (2.2)	552 (2.4)		550 (2.2)	553 (2.3)	566 (2.5)	550 (2.2)	550 (2.2)
Hong Kong SAR	545 (3.8)	548 (4.0)		545 (3.8)	546 (3.9)	550 (3.7)	545 (3.8)	545 (3.8)
Finland	542 (2.9)	545 (3.0)		542 (2.9)	544 (3.0)	550 (2.9)	542 (2.9)	542 (2.9)
Lithuania	537 (2.9)	542 (3.0)		537 (2.9)	539 (2.8)	548 (3.0)	537 (2.9)	537 (2.9)
Macao SAR	536 (1.4)	540 (1.3)		536 (1.4)	536 (1.3)	549 (1.3)	536 (1.4)	536 (1.4)
Sweden	533 (3.2)	536 (3.2)		533 (3.2)	533 (3.1)	545 (3.2)	533 (3.2)	533 (3.2)
Ireland	532 (3.2)	538 (3.3)		532 (3.2)	535 (3.2)	538 (3.4)	532 (3.2)	532 (3.2)
United States	532 (2.8)	540 (2.9)		532 (2.8)	539 (2.8)	540 (2.9)	532 (2.8)	532 (2.8)
Norway (5)	530 (2.6)	534 (2.6)		530 (2.6)	530 (2.6)	540 (2.7)	530 (2.6)	530 (2.6)
Czech Republic	526 (2.3)	532 (2.3)		526 (2.3)	532 (2.4)	544 (2.4)	526 (2.3)	526 (2.3)
Latvia	526 (3.0)	529 (3.0)		526 (3.0)	528 (3.0)	539 (3.0)	526 (3.0)	526 (3.0)
Romania	526 (4.8)	533 (5.0)		526 (4.8)	529 (4.8)	533 (5.0)	526 (4.8)	526 (4.8)
Slovenia	526 (2.3)	535 (2.5)		526 (2.3)	529 (2.5)	535 (2.6)	526 (2.3)	526 (2.3)
Hungary	524 (3.2)	528 (3.3)		524 (3.2)	527 (3.2)	533 (3.3)	524 (3.2)	524 (3.2)
Denmark	522 (2.6)	525 (2.7)		522 (2.6)	525 (2.6)	527 (2.7)	522 (2.6)	522 (2.6)
Canada	521 (2.0)	527 (2.1)		521 (2.0)	528 (2.1)	531 (2.1)	521 (2.0)	521 (2.0)
Slovak Republic	521 (3.3)	528 (3.4)		521 (3.3)	527 (3.3)	536 (3.4)	521 (3.3)	521 (3.3)
Netherlands	517 (2.9)	519 (3.2)		517 (2.9)	521 (3.1)	525 (3.4)	517 (2.9)	517 (2.9)
New Zealand	517 (2.8)	522 (3.1)		517 (2.8)	521 (3.0)	524 (3.1)	517 (2.8)	517 (2.8)
Germany	515 (2.8)	518 (3.0)		515 (2.8)	517 (2.9)	523 (3.0)	515 (2.8)	515 (2.8)
Italy	511 (2.5)	520 (2.5)		511 (2.5)	511 (2.6)	520 (2.6)	511 (2.5)	511 (2.5)
Portugal	511 (2.3)	521 (2.3)		511 (2.3)	514 (2.3)	524 (2.4)	511 (2.3)	511 (2.3)
Serbia	510 (3.2)	511 (3.4)		510 (3.2)	512 (3.2)	519 (3.3)	510 (3.2)	510 (3.2)
Spain	504 (2.1)	512 (2.2)		504 (2.1)	505 (2.2)	516 (2.3)	504 (2.1)	504 (2.1)
United Arab Emirates	495 (1.8)	500 (1.9)		495 (1.8)	499 (1.8)	501 (1.9)	495 (1.8)	495 (1.8)
Albania	491 (4.5)	500 (4.6)		491 (4.5)	491 (4.6)	490 (4.5)	491 (4.5)	491 (4.5)
Belgium (Flemish)	488 (2.6)	488 (2.6)		488 (2.6)	491 (2.7)	497 (2.8)	488 (2.6)	488 (2.6)
France	488 (3.0)	489 (3.1)		488 (3.0)	487 (3.2)	498 (3.3)	488 (3.0)	488 (3.0)
Belgium (French)	481 (2.8)	483 (3.0)		481 (2.8)	481 (2.9)	490 (3.0)	481 (2.8)	481 (2.8)
Chile	479 (2.7)	486 (2.9)		479 (2.7)	486 (2.8)	495 (2.9)	479 (2.7)	479 (2.7)
Bahrain	475 (3.9)	480 (4.2)		475 (3.9)	479 (4.1)	481 (4.1)	475 (3.9)	475 (3.9)
Qatar	472 (3.6)	479 (3.8)		472 (3.6)	473 (3.7)	477 (3.8)	472 (3.6)	472 (3.6)
Kazakhstan	467 (3.5)	468 (3.6)		467 (3.5)	470 (3.6)	468 (3.7)	467 (3.5)	467 (3.5)
Georgia	465 (3.4)	465 (3.7)		465 (3.4)	466 (3.5)	466 (3.7)	465 (3.4)	465 (3.4)
Montenegro	461 (2.0)	465 (2.1)		461 (2.0)	462 (2.0)	465 (2.1)	461 (2.0)	461 (2.0)
Armenia	457 (2.7)	454 (2.7)		457 (2.7)	456 (2.8)	454 (2.8)	457 (2.7)	457 (2.7)
Bosnia & Herzegovina	448 (3.7)	455 (3.8)		448 (3.7)	448 (4.1)	455 (4.3)	448 (3.7)	448 (3.7)
North Macedonia	439 (3.9)	442 (4.1)		439 (3.9)	436 (4.1)	436 (4.2)	439 (3.9)	439 (3.9)
Oman	433 (4.2)	435 (4.5)		433 (4.2)	434 (4.3)	436 (4.3)	433 (4.2)	433 (4.2)
Saudi Arabia	428 (4.0)	426 (4.3)		428 (4.0)	425 (4.0)	426 (4.0)	428 (4.0)	428 (4.0)
Brazil	425 (3.5)	428 (3.7)		425 (3.5)	426 (3.6)	428 (3.9)	425 (3.5)	425 (3.5)
Jordan	418 (4.9)	414 (5.2)		418 (4.9)	417 (4.9)	418 (5.1)	418 (4.9)	418 (4.9)
Uzbekistan	412 (3.5)	413 (3.8)		412 (3.5)	413 (3.7)	416 (3.8)	412 (3.5)	412 (3.5)
Kosovo	403 (3.6)	404 (4.1)		403 (3.6)	397 (3.8)	400 (4.0)	403 (3.6)	403 (3.6)
International Average	505 (0.4)	509 (0.5)		505 (0.4)	506 (0.4)	511 (0.5)	505 (0.4)	505 (0.4)
Benchmarking Participants								
Dubai, UAE	562 (1.8)	572 (1.9)		562 (1.8)	566 (1.8)	571 (1.9)	562 (1.8)	562 (1.8)
Ontario, Canada	525 (3.2)	532 (3.3)		525 (3.2)	533 (3.3)	536 (3.4)	525 (3.2)	525 (3.2)
Quebec, Canada	508 (2.7)	512 (2.8)		508 (2.7)	511 (2.7)	518 (2.9)	508 (2.7)	508 (2.7)
Sharjah, UAE	503 (3.9)	509 (4.0)		503 (3.9)	507 (3.9)	509 (4.0)	503 (3.9)	503 (3.9)
Abu Dhabi, UAE	446 (2.6)	448 (2.8)		446 (2.6)	450 (2.7)	450 (2.8)	446 (2.6)	446 (2.6)
Number of Items (Score Points)*	173 (185)	104 (111)		173 (185)	120 (127)	82 (90)	173 (185)	173 (185)

* The number of items and score points are based on the number of items included in scaling the fourth-grade science achievement data.

See Chapter 9 in *TIMSS 2023 Technical Report (Methods and Procedures)* for information about items deleted or recoded for scaling.

() Standard errors appear in parentheses. Because of rounding some results may appear inconsistent.

SOURCE: IEA's Trends in International Mathematics and Science Study - TIMSS 2023
Downloaded from <https://timss2023.org/results>

Exhibit C.3: Average Scale Scores for the Mathematics Test-Curriculum Matching Analysis

Results based on items identified by each country as addressed in its curriculum

Read down the column under a country name to compare achievement scores based on the items identified by that country. Scores on the diagonal are countries' achievement scores based on the test items they identified.

Country	Average Mathematics Scale Score based on All Items	Singapore	Chinese Taipei	Korea, Rep. of	Japan	Hong Kong SAR	England	Ireland	Czech Republic	Sweden	Lithuania
Singapore	605 (6.1)	606 (6.1)	605 (6.0)	605 (6.0)	605 (6.0)	607 (6.1)	605 (6.0)	607 (6.1)	605 (6.1)	605 (6.0)	606 (6.1)
Chinese Taipei	602 (3.1)	603 (3.1)	603 (3.1)	602 (3.1)	601 (3.1)	604 (3.1)	602 (3.1)	602 (3.1)	603 (3.1)	602 (3.1)	604 (3.1)
Korea, Rep. of	596 (3.0)	596 (3.1)	596 (3.0)	597 (3.1)	596 (3.1)	598 (3.1)	595 (3.0)	595 (3.0)	596 (3.0)	596 (3.1)	596 (3.0)
Japan	595 (3.0)	594 (3.0)	594 (3.0)	596 (3.0)	599 (3.1)	592 (3.1)	594 (3.0)	593 (3.1)	593 (3.1)	596 (3.1)	592 (3.1)
Hong Kong SAR	575 (5.0)	575 (5.1)	575 (5.0)	574 (5.0)	575 (5.0)	577 (5.1)	575 (5.0)	577 (5.1)	576 (5.0)	574 (5.0)	576 (5.0)
England	525 (4.5)	524 (4.5)	525 (4.5)	526 (4.5)	527 (4.6)	524 (4.5)	526 (4.5)	525 (4.6)	524 (4.5)	526 (4.5)	524 (4.6)
Ireland	522 (2.7)	522 (2.7)	522 (2.8)	524 (2.8)	524 (2.8)	520 (2.7)	523 (2.7)	523 (2.7)	519 (2.7)	522 (2.8)	519 (2.8)
Czech Republic	518 (2.3)	518 (2.3)	518 (2.3)	518 (2.3)	518 (2.3)	522 (2.3)	519 (2.3)	518 (2.3)	521 (2.3)	518 (2.3)	521 (2.3)
Sweden	517 (2.4)	517 (2.4)	517 (2.4)	519 (2.4)	521 (2.5)	516 (2.4)	519 (2.5)	518 (2.4)	516 (2.4)	518 (2.4)	516 (2.4)
Lithuania	514 (3.1)	514 (3.1)	514 (3.2)	513 (3.2)	514 (3.2)	517 (3.1)	514 (3.2)	515 (3.1)	516 (3.1)	514 (3.1)	517 (3.1)
Austria	512 (2.3)	512 (2.3)	512 (2.3)	512 (2.3)	512 (2.3)	516 (2.3)	513 (2.3)	512 (2.3)	515 (2.3)	512 (2.3)	516 (2.3)
Australia	509 (3.5)	508 (3.5)	509 (3.5)	509 (3.5)	511 (3.5)	506 (3.5)	510 (3.5)	509 (3.5)	506 (3.5)	510 (3.5)	506 (3.5)
Türkiye	509 (4.3)	508 (4.3)	509 (4.3)	508 (4.3)	509 (4.4)	507 (4.3)	509 (4.2)	508 (4.3)	507 (4.3)	509 (4.3)	506 (4.3)
Hungary	506 (3.7)	506 (3.8)	506 (3.7)	506 (3.8)	507 (3.8)	509 (3.8)	507 (3.8)	506 (3.7)	508 (3.8)	506 (3.7)	509 (3.8)
Finland	504 (2.6)	503 (2.6)	504 (2.6)	505 (2.6)	506 (2.6)	504 (2.6)	505 (2.6)	504 (2.6)	504 (2.6)	504 (2.6)	504 (2.6)
Italy	501 (3.0)	501 (3.0)	501 (3.0)	500 (3.0)	499 (2.9)	502 (3.0)	501 (3.0)	501 (3.0)	501 (3.0)	500 (2.9)	501 (3.0)
Norway (9)	501 (2.3)	501 (2.2)	501 (2.3)	501 (2.3)	503 (2.3)	498 (2.2)	503 (2.3)	501 (2.3)	499 (2.2)	501 (2.3)	498 (2.2)
Malta	499 (1.2)	499 (1.2)	499 (1.2)	499 (1.2)	500 (1.2)	499 (1.2)	500 (1.2)	501 (1.2)	499 (1.2)	500 (1.2)	499 (1.2)
Romania	496 (4.9)	497 (4.9)	496 (4.9)	494 (4.8)	493 (4.8)	499 (4.8)	494 (4.8)	498 (4.9)	498 (4.8)	495 (4.8)	497 (4.8)
Cyprus	494 (2.7)	494 (2.7)	494 (2.7)	494 (2.7)	493 (2.7)	495 (2.7)	492 (2.7)	495 (2.7)	494 (2.7)	493 (2.7)	494 (2.7)
United Arab Emirates	489 (1.7)	489 (1.7)	488 (1.7)	488 (1.7)	487 (1.7)	489 (1.7)	487 (1.7)	489 (1.7)	489 (1.7)	488 (1.7)	489 (1.7)
United States	488 (4.2)	487 (4.2)	488 (4.2)	488 (4.2)	489 (4.2)	487 (4.2)	488 (4.2)	487 (4.2)	487 (4.2)	489 (4.2)	488 (4.2)
Israel	487 (3.9)	487 (3.9)	487 (3.8)	487 (3.8)	488 (3.8)	489 (3.9)	486 (3.8)	487 (3.8)	489 (3.8)	488 (3.8)	488 (3.8)
New Zealand	485 (4.1)	485 (4.0)	486 (4.1)	486 (4.1)	487 (4.1)	484 (4.1)	487 (4.1)	485 (4.1)	484 (4.1)	486 (4.1)	484 (4.1)
France	479 (3.1)	478 (3.1)	479 (3.1)	479 (3.1)	479 (3.1)	478 (3.1)	480 (3.1)	478 (3.2)	478 (3.1)	479 (3.1)	478 (3.1)
Portugal	475 (2.7)	475 (2.7)	475 (2.7)	475 (2.7)	475 (2.7)	478 (2.7)	476 (2.7)	475 (2.7)	477 (2.7)	476 (2.7)	477 (2.7)
Georgia	467 (3.2)	468 (3.2)	467 (3.2)	466 (3.2)	465 (3.2)	470 (3.2)	466 (3.2)	468 (3.2)	469 (3.2)	466 (3.2)	468 (3.2)
Kazakhstan	454 (3.5)	455 (3.5)	454 (3.5)	453 (3.5)	452 (3.5)	458 (3.5)	454 (3.5)	455 (3.5)	456 (3.5)	454 (3.5)	456 (3.6)
Qatar	451 (4.2)	451 (4.2)	451 (4.2)	451 (4.3)	451 (4.3)	452 (4.2)	452 (4.2)	452 (4.2)	452 (4.2)	452 (4.3)	452 (4.2)
Bahrain	426 (2.4)	427 (2.4)	426 (2.4)	426 (2.5)	426 (2.5)	427 (2.4)	427 (2.4)	427 (2.4)	427 (2.4)	427 (2.4)	426 (2.4)
Uzbekistan	421 (4.3)	423 (4.3)	421 (4.3)	420 (4.3)	419 (4.3)	425 (4.3)	420 (4.2)	422 (4.3)	423 (4.3)	420 (4.3)	423 (4.4)
Chile	416 (3.2)	416 (3.2)	416 (3.2)	415 (3.2)	416 (3.3)	416 (3.2)	417 (3.2)	414 (3.2)	416 (3.2)	416 (3.2)	416 (3.2)
Malaysia	411 (3.5)	411 (3.5)	411 (3.5)	410 (3.5)	411 (3.5)	413 (3.5)	412 (3.5)	411 (3.5)	412 (3.5)	411 (3.5)	413 (3.5)
Oman	411 (2.7)	412 (2.7)	411 (2.7)	411 (2.7)	412 (2.7)	411 (2.7)	410 (2.7)	412 (2.7)	410 (2.7)	411 (2.7)	410 (2.7)
Saudi Arabia	397 (3.3)	398 (3.2)	397 (3.3)	396 (3.3)	397 (3.2)	397 (3.2)	397 (3.2)	399 (3.2)	396 (3.2)	397 (3.2)	396 (3.3)
Jordan	388 (3.2)	389 (3.2)	388 (3.2)	388 (3.2)	387 (3.2)	391 (3.2)	389 (3.2)	390 (3.2)	389 (3.2)	388 (3.2)	389 (3.2)
Palestinian Nat'l Auth.	382 (3.0)	383 (3.0)	382 (3.0)	380 (3.0)	379 (3.0)	383 (2.9)	382 (2.9)	383 (2.9)	382 (3.0)	382 (2.9)	382 (2.9)
Brazil	378 (2.8)	379 (2.8)	378 (2.8)	377 (2.8)	378 (2.8)	380 (2.7)	379 (2.7)	379 (2.7)	379 (2.7)	379 (2.8)	379 (2.8)
Morocco	378 (3.0)	379 (3.0)	378 (3.0)	378 (3.0)	378 (3.0)	381 (3.0)	377 (2.9)	378 (3.0)	380 (3.0)	378 (3.0)	380 (3.0)
International Average	484 (0.5)	484 (0.5)	484 (0.5)	484 (0.5)	484 (0.5)	485 (0.5)	484 (0.5)	485 (0.5)	484 (0.5)	484 (0.5)	484 (0.5)
Benchmarking Participants											
Dubai, UAE	546 (2.8)	546 (2.8)	546 (2.8)	545 (2.8)	544 (2.8)	546 (2.7)	545 (2.8)	547 (2.8)	546 (2.7)	546 (2.8)	545 (2.8)
Sharjah, UAE	496 (4.8)	496 (4.8)	496 (4.8)	495 (4.8)	493 (4.7)	497 (4.8)	494 (4.8)	496 (4.8)	496 (4.8)	495 (4.8)	496 (4.8)
Abu Dhabi, UAE	454 (2.8)	454 (2.8)	454 (2.8)	453 (2.8)	453 (2.8)	454 (2.8)	453 (2.8)	454 (2.8)	454 (2.8)	454 (2.8)	454 (2.8)
Number of Items (Score Points)*	200 (207)	195 (202)	199 (206)	188 (195)	177 (182)	183 (190)	180 (187)	177 (183)	188 (195)	186 (191)	181 (188)

* The number of items and score points are based on the number of items included in scaling the eighth-grade mathematics achievement data.

See Chapter 9 in *TIMSS 2023 Technical Report (Methods and Procedures)* for information about items deleted or recoded for scaling.

() Standard errors appear in parentheses. Because of rounding some results may appear inconsistent.

SOURCE: IEA's Trends in International Mathematics and Science Study - TIMSS 2023
Downloaded from <https://timss2023.org/results>

Exhibit C.3: Average Scale Scores for the Mathematics Test-Curriculum Matching Analysis

Results based on items identified by each country as addressed in its curriculum

(Continued)

Country	Average Mathematics Scale Score based on All Items	Austria	Australia	Türkiye	Hungary	Finland	Italy	Norway (9)	Malta	Romania	Cyprus
Singapore	605 (6.1)	606 (6.1)	605 (6.0)	606 (6.1)	606 (6.1)	607 (6.1)	607 (6.1)	606 (6.0)	606 (6.0)	605 (6.0)	608 (6.1)
Chinese Taipei	602 (3.1)	603 (3.1)	603 (3.1)	603 (3.1)	603 (3.1)	602 (3.1)	603 (3.1)	603 (3.1)	603 (3.1)	602 (3.1)	603 (3.1)
Korea, Rep. of	596 (3.0)	596 (3.1)	595 (3.0)	596 (3.1)	596 (3.1)	595 (3.1)	595 (3.1)	596 (3.0)	596 (3.1)	596 (3.1)	596 (3.1)
Japan	595 (3.0)	593 (3.1)	595 (3.1)	594 (3.1)	595 (3.1)	595 (3.0)	594 (3.1)	596 (3.1)	594 (3.1)	595 (3.0)	594 (3.1)
Hong Kong SAR	575 (5.0)	577 (5.1)	575 (5.0)	575 (5.1)	575 (5.0)	576 (5.0)	575 (5.0)	575 (5.0)	575 (5.0)	575 (5.0)	578 (5.1)
England	525 (4.5)	524 (4.5)	526 (4.5)	525 (4.5)	525 (4.5)	525 (4.6)	525 (4.5)	525 (4.5)	525 (4.6)	525 (4.5)	526 (4.5)
Ireland	522 (2.7)	519 (2.8)	522 (2.8)	521 (2.7)	522 (2.7)	522 (2.7)	522 (2.8)	522 (2.7)	522 (2.7)	522 (2.7)	523 (2.7)
Czech Republic	518 (2.3)	522 (2.3)	518 (2.3)	519 (2.3)	518 (2.3)	518 (2.3)	519 (2.3)	518 (2.3)	518 (2.3)	518 (2.3)	519 (2.3)
Sweden	517 (2.4)	516 (2.4)	517 (2.4)	517 (2.4)	517 (2.4)	518 (2.4)	517 (2.4)	518 (2.4)	517 (2.4)	517 (2.4)	517 (2.4)
Lithuania	514 (3.1)	516 (3.1)	513 (3.1)	515 (3.1)	514 (3.2)	514 (3.2)	514 (3.1)	514 (3.1)	514 (3.1)	514 (3.1)	515 (3.1)
Austria	512 (2.3)	516 (2.3)	512 (2.3)	513 (2.3)	512 (2.3)	512 (2.3)	513 (2.3)	512 (2.3)	513 (2.3)	512 (2.3)	513 (2.3)
Australia	509 (3.5)	506 (3.5)	509 (3.5)	508 (3.5)	509 (3.5)	509 (3.5)	509 (3.5)	509 (3.5)	509 (3.5)	509 (3.5)	509 (3.5)
Türkiye	509 (4.3)	506 (4.3)	510 (4.4)	508 (4.3)	509 (4.3)	508 (4.3)	508 (4.3)	508 (4.3)	508 (4.3)	509 (4.3)	509 (4.3)
Hungary	506 (3.7)	509 (3.8)	506 (3.7)	507 (3.7)	506 (3.7)	506 (3.7)	507 (3.7)	506 (3.7)	506 (3.7)	506 (3.8)	506 (3.7)
Finland	504 (2.6)	504 (2.5)	504 (2.6)	504 (2.5)	504 (2.6)	504 (2.6)	504 (2.5)	504 (2.6)	504 (2.6)	504 (2.6)	504 (2.6)
Italy	501 (3.0)	501 (3.0)	500 (3.0)	501 (3.0)	501 (3.0)	501 (3.0)	501 (3.0)	501 (3.0)	501 (3.0)	501 (3.0)	502 (3.0)
Norway (9)	501 (2.3)	499 (2.2)	500 (2.2)	500 (2.2)	501 (2.2)	501 (2.3)	501 (2.2)	501 (2.3)	500 (2.3)	501 (2.3)	500 (2.2)
Malta	499 (1.2)	499 (1.2)	500 (1.2)	499 (1.2)	500 (1.2)	500 (1.2)	500 (1.2)	499 (1.2)	500 (1.2)	499 (1.2)	501 (1.2)
Romania	496 (4.9)	497 (4.8)	496 (4.8)	496 (4.9)	496 (4.8)	495 (4.9)	496 (4.9)	496 (4.9)	496 (4.9)	496 (4.9)	498 (4.9)
Cyprus	494 (2.7)	494 (2.7)	494 (2.7)	494 (2.7)	493 (2.7)	494 (2.7)	494 (2.7)	493 (2.7)	494 (2.7)	494 (2.7)	496 (2.7)
United Arab Emirates	489 (1.7)	489 (1.7)	489 (1.7)	489 (1.7)	489 (1.7)	488 (1.7)	488 (1.7)	488 (1.7)	489 (1.7)	489 (1.7)	489 (1.7)
United States	488 (4.2)	487 (4.2)	488 (4.2)	488 (4.2)	488 (4.2)	488 (4.2)	488 (4.2)	488 (4.2)	488 (4.2)	488 (4.2)	488 (4.2)
Israel	487 (3.9)	489 (3.9)	487 (3.9)	488 (3.8)	488 (3.8)	488 (3.9)	488 (3.8)	488 (3.8)	487 (3.8)	487 (3.9)	488 (3.8)
New Zealand	485 (4.1)	484 (4.1)	485 (4.1)	485 (4.1)	486 (4.1)	486 (4.1)	486 (4.1)	486 (4.1)	485 (4.1)	486 (4.1)	486 (4.1)
France	479 (3.1)	478 (3.2)	478 (3.1)	478 (3.1)	479 (3.1)	479 (3.1)	479 (3.1)	478 (3.1)	479 (3.1)	479 (3.1)	479 (3.1)
Portugal	475 (2.7)	478 (2.7)	475 (2.7)	476 (2.7)	476 (2.7)	475 (2.7)	476 (2.7)	475 (2.7)	476 (2.7)	476 (2.7)	476 (2.7)
Georgia	467 (3.2)	469 (3.2)	466 (3.2)	467 (3.2)	467 (3.2)	466 (3.2)	466 (3.2)	466 (3.2)	467 (3.2)	467 (3.2)	467 (3.2)
Kazakhstan	454 (3.5)	457 (3.5)	454 (3.5)	454 (3.5)	454 (3.5)	453 (3.5)	454 (3.5)	454 (3.5)	454 (3.5)	454 (3.5)	456 (3.5)
Qatar	451 (4.2)	452 (4.2)	452 (4.3)	452 (4.2)	452 (4.3)	451 (4.3)	452 (4.3)	452 (4.2)	452 (4.2)	451 (4.2)	452 (4.2)
Bahrain	426 (2.4)	427 (2.4)	427 (2.5)	426 (2.4)	426 (2.4)	426 (2.4)	426 (2.4)	427 (2.4)	427 (2.5)	426 (2.4)	427 (2.5)
Uzbekistan	421 (4.3)	423 (4.3)	421 (4.4)	422 (4.3)	421 (4.3)	420 (4.3)	421 (4.3)	421 (4.3)	421 (4.3)	421 (4.3)	422 (4.3)
Chile	416 (3.2)	417 (3.2)	415 (3.3)	416 (3.2)	416 (3.2)	416 (3.2)	416 (3.2)	416 (3.2)	416 (3.2)	416 (3.2)	416 (3.3)
Malaysia	411 (3.5)	413 (3.5)	411 (3.5)	411 (3.5)	411 (3.5)	411 (3.5)	411 (3.5)	412 (3.5)	411 (3.5)	411 (3.5)	412 (3.5)
Oman	411 (2.7)	410 (2.7)	411 (2.7)	411 (2.7)	411 (2.7)	411 (2.7)	411 (2.7)	411 (2.7)	412 (2.7)	411 (2.7)	412 (2.7)
Saudi Arabia	397 (3.3)	396 (3.2)	397 (3.3)	397 (3.2)	397 (3.3)	397 (3.2)	397 (3.3)	397 (3.2)	398 (3.2)	397 (3.3)	398 (3.2)
Jordan	388 (3.2)	389 (3.2)	389 (3.2)	388 (3.2)	388 (3.2)	388 (3.2)	388 (3.2)	388 (3.2)	389 (3.2)	388 (3.2)	390 (3.1)
Palestinian Nat'l Auth.	382 (3.0)	382 (2.9)	382 (3.0)	382 (2.9)	382 (3.0)	381 (3.0)	381 (3.0)	382 (2.9)	382 (3.0)	382 (3.0)	383 (2.9)
Brazil	378 (2.8)	379 (2.7)	378 (2.8)	379 (2.7)	378 (2.8)	378 (2.8)	378 (2.8)	378 (2.8)	378 (2.8)	378 (2.8)	379 (2.7)
Morocco	378 (3.0)	380 (3.0)	378 (3.0)	379 (3.0)	378 (3.0)	378 (3.0)	378 (3.0)	377 (3.0)	379 (3.0)	378 (3.0)	379 (3.0)
International Average	484 (0.5)	485 (0.5)	484 (0.5)	484 (0.5)	484 (0.5)	484 (0.5)	484 (0.5)	484 (0.5)	484 (0.5)	484 (0.5)	485 (0.5)
Benchmarking Participants											
Dubai, UAE	546 (2.8)	545 (2.7)	546 (2.8)	546 (2.8)	546 (2.8)	546 (2.8)	546 (2.8)	545 (2.7)	546 (2.7)	546 (2.8)	546 (2.8)
Sharjah, UAE	496 (4.8)	496 (4.8)	496 (4.8)	496 (4.8)	496 (4.8)	495 (4.8)	495 (4.8)	495 (4.8)	496 (4.8)	496 (4.8)	496 (4.8)
Abu Dhabi, UAE	454 (2.8)	454 (2.8)	454 (2.8)	454 (2.8)	454 (2.8)	454 (2.8)	454 (2.8)	454 (2.8)	454 (2.8)	454 (2.8)	455 (2.8)
Number of Items (Score Points)*	200 (207)	187 (194)	186 (192)	193 (200)	197 (204)	194 (201)	191 (198)	190 (196)	194 (201)	200 (207)	175 (182)

* The number of items and score points are based on the number of items included in scaling the eighth-grade mathematics achievement data.

See Chapter 9 in *TIMSS 2023 Technical Report (Methods and Procedures)* for information about items deleted or recoded for scaling.

() Standard errors appear in parentheses. Because of rounding some results may appear inconsistent.

SOURCE: IEA's Trends in International Mathematics and Science Study - TIMSS 2023
Downloaded from <https://timss2023.org/results>

Exhibit C.3: Average Scale Scores for the Mathematics Test-Curriculum Matching Analysis

Results based on items identified by each country as addressed in its curriculum

(Continued)

Country	Average Mathematics Scale Score based on All Items	United Arab Emirates	United States	Israel	New Zealand	France	Portugal	Georgia	Kazakhstan	Qatar	Bahrain
Singapore	605 (6.1)	605 (6.1)	605 (6.1)	604 (6.2)	605 (6.0)	606 (6.1)	605 (6.1)	606 (6.0)	605 (6.1)	605 (6.0)	605 (6.0)
Chinese Taipei	602 (3.1)	602 (3.1)	603 (3.1)	601 (3.1)	602 (3.1)	604 (3.1)	604 (3.1)	605 (3.1)	602 (3.1)	602 (3.1)	602 (3.1)
Korea, Rep. of	596 (3.0)	596 (3.0)	596 (3.0)	594 (3.1)	594 (3.1)	595 (3.0)	597 (3.0)	597 (3.1)	596 (3.0)	596 (3.1)	596 (3.1)
Japan	595 (3.0)	595 (3.0)	595 (3.1)	592 (3.1)	596 (3.1)	596 (3.0)	593 (3.1)	594 (3.0)	595 (3.0)	595 (3.0)	595 (3.0)
Hong Kong SAR	575 (5.0)	575 (5.0)	575 (5.0)	576 (5.1)	573 (5.0)	575 (5.1)	576 (5.0)	576 (5.1)	575 (5.0)	575 (5.0)	575 (5.0)
England	525 (4.5)	525 (4.5)	525 (4.5)	523 (4.5)	527 (4.6)	525 (4.6)	524 (4.5)	525 (4.5)	525 (4.5)	525 (4.5)	525 (4.5)
Ireland	522 (2.7)	522 (2.7)	522 (2.7)	519 (2.8)	524 (2.8)	522 (2.7)	519 (2.8)	521 (2.7)	522 (2.7)	521 (2.7)	522 (2.7)
Czech Republic	518 (2.3)	518 (2.3)	518 (2.3)	521 (2.3)	518 (2.3)	518 (2.3)	521 (2.3)	518 (2.3)	518 (2.3)	518 (2.3)	518 (2.3)
Sweden	517 (2.4)	517 (2.4)	517 (2.4)	521 (2.5)	519 (2.5)	517 (2.4)	517 (2.4)	517 (2.4)	517 (2.4)	517 (2.4)	517 (2.4)
Lithuania	514 (3.1)	514 (3.1)	514 (3.1)	517 (3.2)	513 (3.1)	514 (3.1)	516 (3.1)	513 (3.2)	514 (3.1)	514 (3.2)	514 (3.2)
Austria	512 (2.3)	512 (2.3)	512 (2.3)	516 (2.4)	513 (2.3)	512 (2.3)	515 (2.3)	512 (2.3)	512 (2.3)	512 (2.3)	512 (2.3)
Australia	509 (3.5)	509 (3.5)	509 (3.5)	507 (3.5)	512 (3.6)	510 (3.5)	506 (3.5)	508 (3.5)	509 (3.5)	509 (3.5)	509 (3.5)
Türkiye	509 (4.3)	509 (4.3)	509 (4.3)	506 (4.3)	510 (4.3)	509 (4.3)	506 (4.3)	509 (4.3)	509 (4.3)	509 (4.3)	509 (4.3)
Hungary	506 (3.7)	506 (3.7)	506 (3.7)	508 (3.8)	507 (3.8)	506 (3.8)	508 (3.8)	506 (3.7)	506 (3.7)	507 (3.8)	506 (3.8)
Finland	504 (2.6)	504 (2.6)	504 (2.6)	506 (2.6)	505 (2.6)	504 (2.6)	505 (2.6)	503 (2.5)	504 (2.6)	504 (2.5)	504 (2.6)
Italy	501 (3.0)	501 (3.0)	501 (3.0)	502 (3.1)	500 (3.0)	501 (3.0)	501 (3.0)	501 (3.0)	501 (3.0)	500 (3.0)	501 (3.0)
Norway (9)	501 (2.3)	501 (2.3)	501 (2.2)	502 (2.3)	502 (2.3)	501 (2.3)	499 (2.2)	500 (2.2)	501 (2.3)	500 (2.2)	501 (2.3)
Malta	499 (1.2)	499 (1.2)	499 (1.2)	499 (1.2)	500 (1.2)	500 (1.2)	498 (1.2)	500 (1.2)	499 (1.2)	500 (1.2)	499 (1.2)
Romania	496 (4.9)	496 (4.9)	496 (4.9)	498 (4.8)	492 (4.8)	495 (4.8)	498 (4.8)	497 (4.8)	496 (4.9)	496 (4.8)	496 (4.8)
Cyprus	494 (2.7)	494 (2.7)	494 (2.7)	496 (2.7)	491 (2.7)	493 (2.7)	494 (2.7)	494 (2.7)	494 (2.7)	494 (2.7)	494 (2.7)
United Arab Emirates	489 (1.7)	489 (1.7)	489 (1.7)	489 (1.7)	488 (1.7)	488 (1.7)	489 (1.7)	489 (1.7)	489 (1.7)	489 (1.7)	488 (1.7)
United States	488 (4.2)	488 (4.2)	488 (4.2)	487 (4.2)	489 (4.2)	488 (4.2)	487 (4.2)	487 (4.2)	488 (4.2)	488 (4.2)	488 (4.2)
Israel	487 (3.9)	487 (3.9)	487 (3.9)	490 (3.9)	486 (3.8)	487 (3.8)	489 (3.8)	488 (3.9)	487 (3.9)	487 (3.8)	487 (3.8)
New Zealand	485 (4.1)	485 (4.1)	485 (4.1)	484 (4.1)	488 (4.1)	486 (4.1)	484 (4.1)	485 (4.1)	485 (4.1)	486 (4.1)	486 (4.1)
France	479 (3.1)	479 (3.1)	479 (3.1)	480 (3.2)	480 (3.2)	479 (3.1)	478 (3.1)	477 (3.1)	479 (3.1)	479 (3.2)	479 (3.1)
Portugal	475 (2.7)	475 (2.7)	475 (2.7)	479 (2.8)	476 (2.7)	476 (2.7)	478 (2.7)	475 (2.7)	475 (2.7)	475 (2.7)	475 (2.7)
Georgia	467 (3.2)	467 (3.2)	467 (3.2)	467 (3.2)	465 (3.2)	466 (3.2)	469 (3.2)	469 (3.2)	467 (3.2)	467 (3.2)	467 (3.2)
Kazakhstan	454 (3.5)	454 (3.5)	454 (3.5)	457 (3.6)	453 (3.5)	454 (3.5)	457 (3.5)	455 (3.5)	454 (3.5)	454 (3.5)	454 (3.5)
Qatar	451 (4.2)	451 (4.2)	451 (4.3)	453 (4.2)	452 (4.3)	452 (4.2)	452 (4.2)	451 (4.2)	451 (4.2)	452 (4.2)	451 (4.2)
Bahrain	426 (2.4)	426 (2.4)	427 (2.4)	427 (2.5)	427 (2.4)	426 (2.4)	426 (2.4)	428 (2.4)	426 (2.4)	426 (2.4)	427 (2.4)
Uzbekistan	421 (4.3)	421 (4.3)	421 (4.3)	423 (4.4)	417 (4.3)	421 (4.3)	424 (4.3)	425 (4.3)	421 (4.3)	421 (4.3)	421 (4.3)
Chile	416 (3.2)	416 (3.2)	416 (3.2)	417 (3.3)	418 (3.3)	416 (3.3)	417 (3.2)	415 (3.2)	416 (3.2)	416 (3.2)	416 (3.2)
Malaysia	411 (3.5)	411 (3.5)	411 (3.5)	411 (3.5)	411 (3.5)	411 (3.5)	412 (3.5)	411 (3.5)	411 (3.5)	411 (3.5)	411 (3.5)
Oman	411 (2.7)	411 (2.7)	411 (2.7)	411 (2.7)	411 (2.7)	411 (2.7)	409 (2.7)	412 (2.7)	411 (2.7)	411 (2.7)	411 (2.7)
Saudi Arabia	397 (3.3)	397 (3.3)	397 (3.3)	398 (3.3)	397 (3.3)	397 (3.2)	396 (3.2)	398 (3.2)	397 (3.3)	397 (3.2)	397 (3.3)
Jordan	388 (3.2)	388 (3.2)	388 (3.2)	390 (3.3)	387 (3.2)	389 (3.2)	389 (3.2)	392 (3.2)	388 (3.2)	388 (3.2)	388 (3.2)
Palestinian Nat'l Auth.	382 (3.0)	382 (3.0)	382 (3.0)	382 (3.0)	380 (3.0)	382 (3.0)	382 (2.9)	385 (3.0)	382 (3.0)	382 (3.0)	382 (3.0)
Brazil	378 (2.8)	378 (2.8)	378 (2.8)	379 (2.8)	378 (2.8)	379 (2.7)	380 (2.7)	379 (2.8)	378 (2.8)	378 (2.8)	378 (2.8)
Morocco	378 (3.0)	378 (3.0)	378 (3.0)	379 (3.1)	377 (3.0)	379 (3.0)	380 (3.0)	379 (3.0)	378 (3.0)	378 (3.0)	378 (3.0)
International Average	484 (0.5)	484 (0.5)	484 (0.5)	485 (0.6)	484 (0.5)	484 (0.5)	485 (0.5)	485 (0.5)	484 (0.5)	484 (0.5)	484 (0.5)
Benchmarking Participants											
Dubai, UAE	546 (2.8)	546 (2.8)	546 (2.8)	545 (2.8)	545 (2.8)	546 (2.8)	545 (2.7)	546 (2.8)	546 (2.8)	546 (2.8)	546 (2.8)
Sharjah, UAE	496 (4.8)	496 (4.8)	496 (4.8)	495 (4.8)	494 (4.7)	495 (4.8)	496 (4.8)	496 (4.8)	496 (4.8)	496 (4.8)	495 (4.8)
Abu Dhabi, UAE	454 (2.8)	454 (2.8)	454 (2.8)	454 (2.8)	453 (2.8)	454 (2.8)	454 (2.8)	455 (2.8)	454 (2.8)	454 (2.8)	454 (2.8)
Number of Items (Score Points)*	200 (207)	200 (207)	200 (207)	171 (178)	174 (180)	186 (193)	188 (195)	185 (191)	200 (207)	195 (202)	199 (206)

* The number of items and score points are based on the number of items included in scaling the eighth-grade mathematics achievement data.

See Chapter 9 in *TIMSS 2023 Technical Report (Methods and Procedures)* for information about items deleted or recoded for scaling.

() Standard errors appear in parentheses. Because of rounding some results may appear inconsistent.

SOURCE: IEA's Trends in International Mathematics and Science Study - TIMSS 2023
Downloaded from <https://timss2023.org/results>

Exhibit C.3: Average Scale Scores for the Mathematics Test-Curriculum Matching Analysis

Results based on items identified by each country as addressed in its curriculum

(Continued)

Country	Average Mathematics Scale Score based on All Items	Uzbekistan	Chile	Malaysia	Oman	Saudi Arabia	Jordan	Palestinian Nat'l Auth.	Brazil	Morocco
Singapore	605 (6.1)	605 (6.1)	606 (6.1)	606 (6.0)	605 (6.1)	605 (6.0)	605 (6.1)	605 (6.0)	605 (6.0)	607 (6.0)
Chinese Taipei	602 (3.1)	602 (3.1)	603 (3.1)	603 (3.1)	602 (3.1)	602 (3.1)	602 (3.1)	602 (3.1)	604 (3.1)	606 (3.1)
Korea, Rep. of	596 (3.0)	596 (3.0)	596 (3.0)	595 (3.0)	596 (3.1)	596 (3.0)	596 (3.0)	596 (3.0)	596 (3.0)	599 (3.0)
Japan	595 (3.0)	595 (3.0)	595 (3.0)	594 (3.0)	595 (3.0)	595 (3.0)	595 (3.0)	594 (3.1)	593 (3.0)	593 (3.1)
Hong Kong SAR	575 (5.0)	575 (5.0)	575 (5.0)	575 (5.0)	575 (5.0)	575 (5.1)	575 (5.0)	575 (5.1)	577 (4.9)	580 (5.1)
England	525 (4.5)	525 (4.5)	525 (4.5)	525 (4.5)	525 (4.5)	525 (4.5)	525 (4.5)	525 (4.5)	526 (4.5)	524 (4.5)
Ireland	522 (2.7)	522 (2.7)	522 (2.7)	522 (2.7)	522 (2.7)	522 (2.7)	522 (2.7)	522 (2.7)	524 (2.7)	519 (2.7)
Czech Republic	518 (2.3)	518 (2.3)	518 (2.3)	518 (2.3)	518 (2.3)	518 (2.3)	518 (2.3)	519 (2.3)	519 (2.3)	522 (2.3)
Sweden	517 (2.4)	517 (2.4)	517 (2.4)	518 (2.4)	517 (2.4)	518 (2.4)	517 (2.4)	517 (2.4)	519 (2.4)	515 (2.4)
Lithuania	514 (3.1)	514 (3.1)	514 (3.2)	513 (3.2)	514 (3.1)	514 (3.2)	514 (3.1)	514 (3.2)	514 (3.2)	517 (3.1)
Austria	512 (2.3)	512 (2.3)	512 (2.3)	512 (2.3)	512 (2.3)	512 (2.3)	512 (2.3)	513 (2.3)	513 (2.3)	516 (2.3)
Australia	509 (3.5)	509 (3.5)	509 (3.5)	509 (3.5)	509 (3.5)	509 (3.5)	509 (3.5)	509 (3.5)	509 (3.5)	505 (3.5)
Türkiye	509 (4.3)	509 (4.3)	509 (4.3)	509 (4.3)	509 (4.3)	509 (4.3)	509 (4.3)	508 (4.3)	511 (4.3)	505 (4.4)
Hungary	506 (3.7)	506 (3.8)	506 (3.7)	506 (3.7)	506 (3.7)	506 (3.7)	506 (3.7)	507 (3.7)	507 (3.7)	508 (3.8)
Finland	504 (2.6)	504 (2.6)	504 (2.6)	503 (2.6)	504 (2.6)	504 (2.6)	504 (2.6)	504 (2.6)	505 (2.6)	505 (2.6)
Italy	501 (3.0)	501 (3.0)	501 (3.0)	500 (3.0)	501 (3.0)	500 (3.0)	501 (3.0)	501 (3.0)	502 (3.0)	503 (3.0)
Norway (9)	501 (2.3)	501 (2.2)	501 (2.2)	501 (2.2)	501 (2.2)	501 (2.3)	501 (2.3)	501 (2.2)	502 (2.2)	497 (2.2)
Malta	499 (1.2)	499 (1.2)	499 (1.2)	500 (1.2)	499 (1.2)	499 (1.2)	499 (1.2)	499 (1.2)	500 (1.2)	499 (1.2)
Romania	496 (4.9)	496 (4.9)	496 (4.9)	496 (4.9)	496 (4.9)	495 (4.9)	496 (4.9)	496 (4.9)	497 (4.8)	500 (4.9)
Cyprus	494 (2.7)	494 (2.7)	494 (2.7)	494 (2.7)	494 (2.7)	494 (2.7)	494 (2.7)	494 (2.7)	494 (2.7)	494 (2.7)
United Arab Emirates	489 (1.7)	489 (1.7)	489 (1.7)	488 (1.7)	489 (1.7)	488 (1.7)	489 (1.7)	489 (1.7)	489 (1.7)	491 (1.7)
United States	488 (4.2)	488 (4.2)	488 (4.2)	488 (4.2)	488 (4.2)	488 (4.2)	488 (4.2)	489 (4.2)	488 (4.2)	488 (4.2)
Israel	487 (3.9)	487 (3.9)	487 (3.9)	488 (3.8)	487 (3.9)	487 (3.9)	487 (3.9)	488 (3.9)	488 (3.8)	489 (3.9)
New Zealand	485 (4.1)	486 (4.1)	486 (4.1)	486 (4.0)	485 (4.1)	486 (4.1)	485 (4.1)	485 (4.1)	486 (4.1)	483 (4.1)
France	479 (3.1)	479 (3.1)	479 (3.2)	479 (3.1)	479 (3.1)	479 (3.1)	479 (3.1)	479 (3.1)	479 (3.1)	478 (3.1)
Portugal	475 (2.7)	476 (2.7)	476 (2.7)	475 (2.7)	475 (2.7)	475 (2.7)	475 (2.7)	475 (2.7)	473 (2.6)	476 (2.7)
Georgia	467 (3.2)	467 (3.2)	467 (3.2)	466 (3.2)	467 (3.2)	467 (3.2)	467 (3.2)	467 (3.2)	468 (3.2)	472 (3.3)
Kazakhstan	454 (3.5)	454 (3.5)	454 (3.5)	453 (3.5)	454 (3.5)	454 (3.5)	454 (3.5)	455 (3.5)	455 (3.5)	458 (3.5)
Qatar	451 (4.2)	451 (4.2)	451 (4.3)	452 (4.2)	451 (4.2)	451 (4.2)	451 (4.2)	452 (4.2)	451 (4.1)	454 (4.2)
Bahrain	426 (2.4)	427 (2.4)	426 (2.5)	426 (2.4)	426 (2.4)	426 (2.4)	426 (2.4)	427 (2.4)	428 (2.5)	428 (2.4)
Uzbekistan	421 (4.3)	421 (4.3)	421 (4.3)	420 (4.3)	421 (4.3)	421 (4.3)	421 (4.3)	421 (4.3)	424 (4.3)	428 (4.3)
Chile	416 (3.2)	416 (3.2)	416 (3.2)	416 (3.2)	416 (3.2)	416 (3.2)	416 (3.2)	416 (3.2)	416 (3.2)	417 (3.2)
Malaysia	411 (3.5)	411 (3.5)	411 (3.5)	411 (3.5)	411 (3.5)	411 (3.5)	411 (3.5)	411 (3.5)	412 (3.5)	415 (3.5)
Oman	411 (2.7)	411 (2.7)	411 (2.7)	411 (2.7)	411 (2.7)	411 (2.7)	411 (2.7)	411 (2.7)	412 (2.7)	412 (2.7)
Saudi Arabia	397 (3.3)	397 (3.3)	397 (3.3)	397 (3.2)	397 (3.3)	397 (3.3)	397 (3.3)	397 (3.3)	398 (3.2)	398 (3.2)
Jordan	388 (3.2)	388 (3.2)	388 (3.2)	389 (3.2)	388 (3.2)	388 (3.2)	388 (3.2)	389 (3.2)	390 (3.1)	393 (3.1)
Palestinian Nat'l Auth.	382 (3.0)	382 (3.0)	382 (3.0)	382 (3.0)	382 (3.0)	382 (3.0)	382 (3.0)	382 (3.0)	383 (2.9)	386 (2.9)
Brazil	378 (2.8)	378 (2.8)	378 (2.8)	378 (2.8)	378 (2.8)	378 (2.8)	378 (2.8)	378 (2.8)	381 (2.7)	380 (2.7)
Morocco	378 (3.0)	378 (3.0)	378 (3.0)	378 (3.0)	378 (3.0)	378 (3.0)	378 (3.0)	378 (3.0)	379 (2.9)	386 (3.0)
International Average	484 (0.5)	484 (0.5)	484 (0.5)	484 (0.5)	484 (0.5)	484 (0.5)	484 (0.5)	484 (0.5)	485 (0.5)	486 (0.5)
Benchmarking Participants										
Dubai, UAE	546 (2.8)	546 (2.8)	546 (2.8)	546 (2.8)	546 (2.8)	546 (2.8)	546 (2.8)	546 (2.8)	545 (2.7)	546 (2.7)
Sharjah, UAE	496 (4.8)	496 (4.8)	496 (4.8)	495 (4.8)	496 (4.8)	495 (4.8)	496 (4.8)	496 (4.8)	496 (4.8)	498 (4.7)
Abu Dhabi, UAE	454 (2.8)	454 (2.8)	454 (2.8)	453 (2.8)	454 (2.8)	454 (2.8)	454 (2.8)	454 (2.8)	454 (2.8)	456 (2.7)
Number of Items (Score Points)*	200 (207)	199 (206)	200 (207)	194 (201)	200 (207)	199 (206)	200 (207)	197 (204)	169 (176)	160 (167)

* The number of items and score points are based on the number of items included in scaling the eighth-grade mathematics achievement data.

See Chapter 9 in *TIMSS 2023 Technical Report (Methods and Procedures)* for information about items deleted or recoded for scaling.

() Standard errors appear in parentheses. Because of rounding some results may appear inconsistent.

SOURCE: IEA's Trends in International Mathematics and Science Study - TIMSS 2023
Downloaded from <https://timss2023.org/results>

Exhibit C.3: Average Scale Scores for the Mathematics Test-Curriculum Matching Analysis

Results based on items identified by each country as addressed in its curriculum

(Continued)

Country	Average Mathematics Scale Score based on All Items	Benchmarking Participants			
			Dubai, UAE	Sharjah, UAE	Abu Dhabi, UAE
Singapore	605 (6.1)		605 (6.1)	605 (6.1)	605 (6.1)
Chinese Taipei	602 (3.1)		602 (3.1)	602 (3.1)	602 (3.1)
Korea, Rep. of	596 (3.0)		596 (3.0)	596 (3.0)	596 (3.0)
Japan	595 (3.0)		595 (3.0)	595 (3.0)	595 (3.0)
Hong Kong SAR	575 (5.0)		575 (5.0)	575 (5.0)	575 (5.0)
England	525 (4.5)		525 (4.5)	525 (4.5)	525 (4.5)
Ireland	522 (2.7)		522 (2.7)	522 (2.7)	522 (2.7)
Czech Republic	518 (2.3)		518 (2.3)	518 (2.3)	518 (2.3)
Sweden	517 (2.4)		517 (2.4)	517 (2.4)	517 (2.4)
Lithuania	514 (3.1)		514 (3.1)	514 (3.1)	514 (3.1)
Austria	512 (2.3)		512 (2.3)	512 (2.3)	512 (2.3)
Australia	509 (3.5)		509 (3.5)	509 (3.5)	509 (3.5)
Türkiye	509 (4.3)		509 (4.3)	509 (4.3)	509 (4.3)
Hungary	506 (3.7)		506 (3.7)	506 (3.7)	506 (3.7)
Finland	504 (2.6)		504 (2.6)	504 (2.6)	504 (2.6)
Italy	501 (3.0)		501 (3.0)	501 (3.0)	501 (3.0)
Norway (9)	501 (2.3)		501 (2.3)	501 (2.3)	501 (2.3)
Malta	499 (1.2)		499 (1.2)	499 (1.2)	499 (1.2)
Romania	496 (4.9)		496 (4.9)	496 (4.9)	496 (4.9)
Cyprus	494 (2.7)		494 (2.7)	494 (2.7)	494 (2.7)
United Arab Emirates	489 (1.7)		489 (1.7)	489 (1.7)	489 (1.7)
United States	488 (4.2)		488 (4.2)	488 (4.2)	488 (4.2)
Israel	487 (3.9)		487 (3.9)	487 (3.9)	487 (3.9)
New Zealand	485 (4.1)		485 (4.1)	485 (4.1)	485 (4.1)
France	479 (3.1)		479 (3.1)	479 (3.1)	479 (3.1)
Portugal	475 (2.7)		475 (2.7)	475 (2.7)	475 (2.7)
Georgia	467 (3.2)		467 (3.2)	467 (3.2)	467 (3.2)
Kazakhstan	454 (3.5)		454 (3.5)	454 (3.5)	454 (3.5)
Qatar	451 (4.2)		451 (4.2)	451 (4.2)	451 (4.2)
Bahrain	426 (2.4)		426 (2.4)	426 (2.4)	426 (2.4)
Uzbekistan	421 (4.3)		421 (4.3)	421 (4.3)	421 (4.3)
Chile	416 (3.2)		416 (3.2)	416 (3.2)	416 (3.2)
Malaysia	411 (3.5)		411 (3.5)	411 (3.5)	411 (3.5)
Oman	411 (2.7)		411 (2.7)	411 (2.7)	411 (2.7)
Saudi Arabia	397 (3.3)		397 (3.3)	397 (3.3)	397 (3.3)
Jordan	388 (3.2)		388 (3.2)	388 (3.2)	388 (3.2)
Palestinian Nat'l Auth.	382 (3.0)		382 (3.0)	382 (3.0)	382 (3.0)
Brazil	378 (2.8)		378 (2.8)	378 (2.8)	378 (2.8)
Morocco	378 (3.0)		378 (3.0)	378 (3.0)	378 (3.0)
International Average	484 (0.5)		484 (0.5)	484 (0.5)	484 (0.5)
Benchmarking Participants					
Dubai, UAE	546 (2.8)		546 (2.8)	546 (2.8)	546 (2.8)
Sharjah, UAE	496 (4.8)		496 (4.8)	496 (4.8)	496 (4.8)
Abu Dhabi, UAE	454 (2.8)		454 (2.8)	454 (2.8)	454 (2.8)
Number of Items (Score Points)*	200 (207)		200 (207)	200 (207)	200 (207)

* The number of items and score points are based on the number of items included in scaling the eighth-grade mathematics achievement data.

See Chapter 9 in *TIMSS 2023 Technical Report (Methods and Procedures)* for information about items deleted or recoded for scaling.

() Standard errors appear in parentheses. Because of rounding some results may appear inconsistent.

SOURCE: IEA's Trends in International Mathematics and Science Study - TIMSS 2023
Downloaded from <https://timss2023.org/results>

Exhibit C.4: Average Scale Scores for the Science Test-Curriculum Matching Analysis

Results based on items identified by each country as addressed in its curriculum

Read down the column under a country name to compare achievement scores based on the items identified by that country. Scores on the diagonal are countries' achievement scores based on the test items they identified.

Country	Average Science Scale Score based on All Items	Singapore	Chinese Taipei	Japan	Korea, Rep. of	England	Finland	Türkiye	Hong Kong SAR	Czech Republic	Ireland
Singapore	606 (5.7)	617 (5.8)	609 (5.7)	625 (5.6)	610 (5.4)	609 (5.7)	610 (5.8)	609 (5.7)	612 (5.6)	607 (5.7)	608 (5.7)
Chinese Taipei	572 (2.4)	564 (2.4)	573 (2.4)	580 (2.3)	569 (2.3)	578 (2.4)	572 (2.5)	573 (2.4)	572 (2.4)	572 (2.4)	573 (2.4)
Japan	557 (3.1)	559 (3.1)	558 (3.1)	576 (3.3)	559 (3.1)	559 (3.1)	557 (3.0)	558 (3.1)	565 (3.3)	557 (3.1)	559 (3.2)
Korea, Rep. of	545 (2.2)	545 (2.2)	545 (2.2)	561 (2.2)	558 (2.4)	544 (2.3)	542 (2.3)	545 (2.2)	552 (2.3)	545 (2.2)	544 (2.2)
England	531 (4.3)	531 (4.4)	531 (4.3)	534 (4.4)	531 (4.4)	531 (4.4)	531 (4.4)	532 (4.3)	532 (4.4)	532 (4.3)	533 (4.3)
Finland	531 (3.2)	530 (3.3)	531 (3.2)	532 (3.7)	532 (3.4)	533 (3.2)	531 (3.2)	533 (3.2)	533 (3.4)	531 (3.2)	532 (3.2)
Türkiye	530 (3.6)	534 (3.6)	531 (3.6)	537 (3.8)	533 (3.7)	531 (3.6)	532 (3.6)	534 (3.7)	532 (3.6)	529 (3.6)	531 (3.6)
Hong Kong SAR	528 (4.7)	528 (4.7)	528 (4.7)	529 (4.4)	531 (4.7)	529 (4.7)	528 (4.7)	530 (4.8)	537 (4.8)	528 (4.7)	530 (4.7)
Czech Republic	527 (2.0)	528 (2.1)	528 (2.0)	538 (2.0)	531 (2.1)	529 (2.0)	529 (2.0)	529 (2.0)	528 (2.0)	527 (2.0)	528 (2.0)
Ireland	525 (3.5)	526 (3.6)	525 (3.6)	529 (3.4)	527 (3.6)	524 (3.6)	525 (3.5)	526 (3.5)	531 (3.5)	525 (3.5)	526 (3.5)
Hungary	522 (3.3)	524 (3.3)	522 (3.3)	528 (3.1)	525 (3.4)	524 (3.3)	523 (3.4)	524 (3.3)	524 (3.3)	522 (3.3)	524 (3.3)
Sweden	521 (2.9)	521 (3.0)	521 (2.9)	524 (3.0)	526 (3.1)	522 (3.0)	522 (3.0)	525 (3.0)	523 (3.0)	522 (2.9)	523 (3.0)
Australia	520 (3.2)	521 (3.2)	520 (3.1)	526 (3.3)	522 (3.2)	520 (3.2)	521 (3.2)	520 (3.1)	524 (3.2)	521 (3.2)	519 (3.1)
Lithuania	519 (3.0)	520 (3.0)	520 (3.0)	529 (3.1)	524 (3.1)	520 (3.0)	519 (3.0)	523 (3.0)	519 (3.0)	519 (3.0)	521 (3.0)
United States	513 (3.9)	515 (3.8)	513 (3.8)	515 (3.9)	515 (3.9)	513 (3.9)	515 (3.8)	513 (3.8)	514 (3.8)	514 (3.8)	512 (3.8)
Austria	512 (2.4)	510 (2.4)	511 (2.4)	523 (2.4)	514 (2.4)	514 (2.4)	512 (2.4)	513 (2.3)	515 (2.4)	512 (2.4)	512 (2.4)
Portugal	506 (2.4)	509 (2.4)	506 (2.3)	504 (2.6)	509 (2.4)	505 (2.4)	506 (2.4)	506 (2.4)	508 (2.4)	506 (2.4)	507 (2.4)
New Zealand	502 (4.0)	504 (4.1)	502 (4.0)	506 (4.4)	504 (4.2)	501 (4.0)	504 (4.0)	503 (4.1)	506 (4.2)	502 (4.0)	501 (4.1)
Italy	501 (3.2)	500 (3.2)	501 (3.2)	505 (3.1)	501 (3.3)	499 (3.2)	499 (3.2)	504 (3.1)	501 (3.3)	501 (3.2)	503 (3.1)
Malta	501 (1.6)	504 (1.6)	501 (1.6)	511 (1.7)	505 (1.7)	501 (1.6)	502 (1.6)	503 (1.6)	506 (1.6)	502 (1.6)	502 (1.6)
Norway (9)	488 (2.6)	489 (2.6)	489 (2.6)	490 (2.6)	489 (2.5)	488 (2.6)	489 (2.6)	491 (2.6)	490 (2.6)	489 (2.6)	490 (2.6)
France	486 (3.2)	488 (3.2)	486 (3.1)	494 (3.4)	490 (3.3)	486 (3.1)	486 (3.2)	487 (3.2)	491 (3.2)	486 (3.2)	487 (3.2)
United Arab Emirates	486 (2.0)	491 (2.0)	487 (2.0)	497 (2.0)	490 (2.0)	489 (2.0)	489 (2.0)	488 (2.0)	488 (2.0)	486 (2.0)	488 (2.1)
Israel	481 (3.6)	484 (3.7)	482 (3.6)	488 (3.6)	480 (3.6)	481 (3.6)	484 (3.6)	482 (3.6)	481 (3.6)	480 (3.6)	482 (3.6)
Qatar	481 (4.3)	487 (4.3)	482 (4.2)	494 (4.4)	493 (4.4)	484 (4.3)	483 (4.3)	484 (4.3)	486 (4.2)	481 (4.3)	485 (4.3)
Romania	466 (4.1)	470 (4.2)	467 (4.1)	481 (4.2)	468 (4.2)	466 (4.1)	466 (4.1)	469 (4.0)	468 (4.0)	466 (4.1)	468 (4.0)
Cyprus	464 (3.0)	469 (3.0)	465 (3.0)	474 (2.9)	468 (3.0)	466 (3.0)	466 (3.0)	467 (2.9)	473 (3.0)	464 (3.0)	467 (2.9)
Oman	456 (2.6)	464 (2.7)	456 (2.6)	467 (2.7)	469 (2.6)	460 (2.6)	458 (2.6)	456 (2.7)	457 (2.6)	455 (2.6)	457 (2.7)
Chile	455 (2.7)	456 (2.8)	456 (2.7)	456 (2.7)	455 (2.8)	455 (2.7)	455 (2.7)	457 (2.7)	455 (2.7)	455 (2.7)	456 (2.7)
Bahrain	452 (2.6)	457 (2.7)	453 (2.6)	464 (2.7)	458 (2.8)	453 (2.6)	454 (2.6)	454 (2.7)	453 (2.7)	452 (2.6)	454 (2.7)
Georgia	448 (2.9)	449 (2.9)	449 (2.9)	462 (3.0)	453 (3.0)	449 (3.0)	448 (3.0)	450 (2.9)	448 (2.9)	448 (2.9)	451 (2.9)
Kazakhstan	443 (3.0)	446 (3.0)	443 (3.0)	452 (2.9)	449 (3.0)	444 (3.0)	445 (3.0)	444 (3.0)	441 (2.9)	442 (3.0)	445 (3.0)
Malaysia	426 (3.7)	432 (3.8)	426 (3.7)	434 (3.7)	430 (3.9)	427 (3.7)	430 (3.7)	427 (3.7)	430 (3.7)	427 (3.7)	426 (3.7)
Brazil	420 (2.5)	420 (2.5)	421 (2.5)	419 (2.5)	422 (2.6)	419 (2.5)	421 (2.5)	422 (2.5)	420 (2.5)	420 (2.5)	421 (2.5)
Saudi Arabia	419 (3.4)	423 (3.5)	420 (3.4)	429 (3.4)	424 (3.5)	421 (3.4)	419 (3.4)	420 (3.4)	423 (3.3)	419 (3.4)	421 (3.4)
Jordan	413 (3.6)	418 (3.7)	413 (3.6)	423 (3.8)	420 (3.7)	414 (3.6)	413 (3.7)	413 (3.6)	415 (3.5)	412 (3.6)	414 (3.7)
Uzbekistan	396 (3.7)	398 (3.8)	395 (3.7)	408 (4.0)	402 (4.0)	398 (3.7)	397 (3.8)	397 (3.7)	399 (3.7)	395 (3.7)	398 (3.7)
Palestinian Nat'l Auth.	393 (2.9)	400 (2.9)	394 (2.9)	415 (2.9)	400 (3.0)	397 (2.9)	395 (2.9)	394 (2.9)	398 (2.8)	392 (2.9)	394 (2.9)
Morocco	327 (3.4)	332 (3.4)	327 (3.4)	332 (3.7)	331 (3.6)	330 (3.3)	330 (3.4)	328 (3.4)	332 (3.4)	327 (3.4)	328 (3.4)
International Average	486 (0.5)	489 (0.5)	487 (0.5)	495 (0.5)	490 (0.5)	488 (0.5)	487 (0.5)	488 (0.5)	489 (0.5)	486 (0.5)	488 (0.5)
Benchmarking Participants											
Dubai, UAE	547 (3.2)	550 (3.2)	548 (3.1)	555 (3.2)	549 (3.2)	549 (3.2)	549 (3.2)	549 (3.2)	548 (3.2)	547 (3.2)	550 (3.2)
Sharjah, UAE	499 (4.9)	503 (4.9)	500 (4.9)	512 (4.9)	503 (5.0)	501 (4.9)	501 (4.9)	501 (4.9)	500 (4.9)	499 (4.9)	502 (5.0)
Abu Dhabi, UAE	443 (3.8)	449 (3.8)	444 (3.8)	453 (3.8)	448 (3.8)	446 (3.7)	447 (3.7)	445 (3.8)	447 (3.7)	444 (3.8)	444 (3.8)
Number of Items (Score Points)*	212 (230)	146 (158)	199 (217)	72 (81)	124 (132)	178 (195)	182 (198)	186 (202)	135 (148)	208 (226)	185 (202)

* The number of items and score points are based on the number of items included in scaling the eighth-grade science achievement data.

See Chapter 9 in *TIMSS 2023 Technical Report (Methods and Procedures)* for information about items deleted or recoded for scaling.

() Standard errors appear in parentheses. Because of rounding some results may appear inconsistent.

SOURCE: IEA's Trends in International Mathematics and Science Study - TIMSS 2023
Downloaded from <https://timss2023.org/results>

Exhibit C.4: Average Scale Scores for the Science Test-Curriculum Matching Analysis

Results based on items identified by each country as addressed in its curriculum

(Continued)

Country	Average Science Scale Score based on All Items	Hungary	Sweden	Australia	Lithuania	United States	Austria	Portugal	New Zealand	Italy	Malta
Singapore	606 (5.7)	607 (5.7)	607 (5.7)	604 (5.5)	604 (5.7)	603 (5.6)	606 (5.7)	606 (5.6)	608 (5.7)	606 (5.7)	607 (5.6)
Chinese Taipei	572 (2.4)	572 (2.4)	572 (2.4)	569 (2.3)	569 (2.4)	570 (2.4)	572 (2.4)	575 (2.4)	575 (2.5)	571 (2.4)	572 (2.4)
Japan	557 (3.1)	557 (3.1)	556 (3.1)	559 (3.2)	559 (3.1)	560 (3.2)	557 (3.1)	559 (3.2)	556 (3.1)	557 (3.1)	558 (3.1)
Korea, Rep. of	545 (2.2)	545 (2.3)	545 (2.3)	550 (2.2)	548 (2.3)	550 (2.2)	545 (2.3)	545 (2.2)	544 (2.2)	546 (2.3)	546 (2.2)
England	531 (4.3)	531 (4.3)	532 (4.3)	534 (4.4)	532 (4.4)	532 (4.4)	531 (4.3)	531 (4.3)	532 (4.3)	531 (4.3)	532 (4.4)
Finland	531 (3.2)	530 (3.2)	530 (3.2)	531 (3.3)	530 (3.2)	530 (3.2)	531 (3.2)	533 (3.2)	534 (3.2)	531 (3.2)	530 (3.2)
Türkiye	530 (3.6)	530 (3.6)	530 (3.6)	533 (3.5)	529 (3.5)	527 (3.5)	530 (3.6)	528 (3.6)	531 (3.6)	529 (3.6)	532 (3.6)
Hong Kong SAR	528 (4.7)	528 (4.7)	528 (4.7)	528 (4.7)	526 (4.7)	526 (4.7)	528 (4.7)	530 (4.7)	531 (4.7)	529 (4.7)	530 (4.8)
Czech Republic	527 (2.0)	527 (2.0)	527 (2.0)	528 (2.0)	528 (2.0)	527 (2.0)	527 (2.0)	527 (2.0)	530 (2.0)	527 (2.0)	528 (2.0)
Ireland	525 (3.5)	526 (3.5)	525 (3.5)	527 (3.8)	525 (3.6)	525 (3.6)	525 (3.5)	526 (3.5)	527 (3.7)	525 (3.5)	526 (3.6)
Hungary	522 (3.3)	521 (3.3)	522 (3.3)	524 (3.2)	522 (3.3)	522 (3.2)	522 (3.3)	522 (3.2)	524 (3.3)	521 (3.3)	524 (3.3)
Sweden	521 (2.9)	521 (3.0)	522 (2.9)	520 (3.0)	520 (2.9)	520 (2.9)	521 (2.9)	524 (2.9)	524 (2.9)	522 (3.0)	520 (3.0)
Australia	520 (3.2)	521 (3.2)	521 (3.1)	526 (3.3)	522 (3.2)	522 (3.2)	520 (3.2)	520 (3.1)	523 (3.2)	520 (3.1)	520 (3.2)
Lithuania	519 (3.0)	519 (3.0)	519 (3.0)	521 (3.0)	521 (3.0)	520 (3.0)	519 (3.0)	521 (3.0)	522 (3.0)	519 (3.0)	518 (3.0)
United States	513 (3.9)	514 (3.9)	513 (3.8)	519 (3.9)	515 (3.9)	515 (3.9)	513 (3.9)	514 (3.8)	515 (3.9)	513 (3.8)	512 (3.9)
Austria	512 (2.4)	512 (2.4)	512 (2.4)	514 (2.5)	512 (2.4)	512 (2.4)	512 (2.4)	511 (2.3)	514 (2.4)	511 (2.4)	512 (2.4)
Portugal	506 (2.4)	505 (2.4)	506 (2.4)	504 (2.4)	505 (2.4)	504 (2.4)	506 (2.4)	509 (2.4)	509 (2.4)	506 (2.4)	507 (2.4)
New Zealand	502 (4.0)	503 (4.0)	503 (4.0)	506 (4.1)	503 (4.0)	503 (4.0)	502 (4.0)	503 (4.0)	505 (4.1)	502 (4.0)	501 (4.1)
Italy	501 (3.2)	500 (3.2)	500 (3.2)	502 (3.2)	502 (3.2)	501 (3.2)	501 (3.2)	504 (3.2)	502 (3.2)	502 (3.2)	501 (3.2)
Malta	501 (1.6)	502 (1.6)	502 (1.6)	504 (1.7)	501 (1.6)	500 (1.6)	501 (1.6)	502 (1.6)	502 (1.6)	501 (1.6)	503 (1.6)
Norway (9)	488 (2.6)	489 (2.6)	489 (2.6)	491 (2.6)	488 (2.6)	489 (2.6)	488 (2.6)	489 (2.6)	491 (2.6)	489 (2.6)	489 (2.6)
France	486 (3.2)	487 (3.2)	487 (3.2)	491 (3.2)	487 (3.2)	488 (3.2)	486 (3.2)	487 (3.2)	490 (3.2)	487 (3.2)	486 (3.2)
United Arab Emirates	486 (2.0)	487 (2.0)	487 (2.0)	488 (2.0)	486 (2.0)	486 (2.0)	486 (2.0)	488 (2.0)	488 (2.0)	487 (2.0)	488 (2.1)
Israel	481 (3.6)	481 (3.6)	480 (3.6)	482 (3.6)	481 (3.6)	481 (3.6)	481 (3.6)	480 (3.6)	482 (3.7)	482 (3.6)	481 (3.7)
Qatar	481 (4.3)	482 (4.2)	482 (4.3)	485 (4.3)	481 (4.3)	482 (4.2)	481 (4.3)	482 (4.3)	483 (4.3)	481 (4.2)	485 (4.3)
Romania	466 (4.1)	466 (4.0)	466 (4.0)	469 (4.0)	467 (4.0)	467 (4.0)	466 (4.1)	469 (4.0)	468 (4.0)	467 (4.0)	467 (4.2)
Cyprus	464 (3.0)	465 (3.0)	465 (3.0)	466 (3.0)	466 (3.0)	465 (3.0)	464 (3.0)	467 (2.9)	466 (3.0)	465 (3.0)	466 (3.0)
Oman	456 (2.6)	456 (2.6)	456 (2.6)	461 (2.6)	456 (2.6)	456 (2.6)	456 (2.6)	454 (2.6)	456 (2.7)	455 (2.6)	459 (2.6)
Chile	455 (2.7)	455 (2.7)	455 (2.7)	457 (2.7)	456 (2.7)	456 (2.7)	455 (2.7)	457 (2.6)	456 (2.7)	456 (2.7)	456 (2.7)
Bahrain	452 (2.6)	452 (2.6)	452 (2.7)	454 (2.7)	452 (2.7)	452 (2.7)	452 (2.6)	453 (2.7)	453 (2.7)	452 (2.6)	453 (2.7)
Georgia	448 (2.9)	447 (2.9)	448 (2.9)	449 (2.9)	449 (2.9)	447 (2.9)	448 (2.9)	450 (2.9)	447 (2.9)	448 (2.9)	448 (3.0)
Kazakhstan	443 (3.0)	443 (3.0)	443 (3.0)	443 (2.9)	443 (3.0)	442 (3.0)	443 (3.0)	442 (3.0)	444 (3.0)	442 (3.0)	443 (3.0)
Malaysia	426 (3.7)	427 (3.7)	426 (3.7)	425 (3.6)	426 (3.7)	427 (3.7)	426 (3.7)	429 (3.7)	427 (3.7)	427 (3.7)	425 (3.7)
Brazil	420 (2.5)	421 (2.5)	420 (2.5)	425 (2.6)	420 (2.5)	421 (2.5)	420 (2.5)	423 (2.5)	421 (2.5)	421 (2.5)	420 (2.5)
Saudi Arabia	419 (3.4)	420 (3.4)	419 (3.4)	422 (3.5)	419 (3.4)	419 (3.4)	419 (3.4)	421 (3.4)	420 (3.4)	420 (3.4)	422 (3.4)
Jordan	413 (3.6)	413 (3.6)	413 (3.6)	416 (3.6)	412 (3.6)	413 (3.6)	413 (3.6)	412 (3.7)	412 (3.6)	414 (3.6)	414 (3.7)
Uzbekistan	396 (3.7)	395 (3.7)	396 (3.7)	400 (3.7)	396 (3.7)	397 (3.7)	396 (3.7)	397 (3.7)	398 (3.8)	396 (3.7)	399 (3.7)
Palestinian Nat'l Auth.	393 (2.9)	393 (2.9)	393 (2.9)	395 (2.8)	393 (2.9)	392 (2.8)	393 (2.9)	393 (2.9)	394 (2.9)	394 (2.9)	397 (2.9)
Morocco	327 (3.4)	328 (3.4)	326 (3.4)	328 (3.6)	327 (3.4)	329 (3.4)	327 (3.4)	330 (3.4)	328 (3.4)	329 (3.4)	330 (3.4)
International Average	486 (0.5)	487 (0.5)	487 (0.5)	488 (0.5)	487 (0.5)	487 (0.5)	486 (0.5)	488 (0.5)	488 (0.5)	487 (0.5)	487 (0.5)
Benchmarking Participants											
Dubai, UAE	547 (3.2)	548 (3.2)	548 (3.2)	547 (3.2)	547 (3.2)	546 (3.2)	547 (3.2)	548 (3.2)	548 (3.2)	548 (3.2)	549 (3.2)
Sharjah, UAE	499 (4.9)	499 (4.9)	499 (4.9)	499 (4.8)	498 (4.9)	498 (4.9)	499 (4.9)	500 (4.9)	501 (4.9)	499 (4.9)	501 (5.0)
Abu Dhabi, UAE	443 (3.8)	444 (3.7)	444 (3.8)	446 (3.8)	443 (3.8)	444 (3.8)	443 (3.8)	445 (3.7)	445 (3.7)	444 (3.8)	445 (3.8)
Number of Items (Score Points)*	212 (230)	207 (224)	207 (224)	151 (165)	204 (222)	191 (207)	212 (230)	184 (200)	176 (189)	202 (219)	181 (198)

* The number of items and score points are based on the number of items included in scaling the eighth-grade science achievement data.

See Chapter 9 in *TIMSS 2023 Technical Report (Methods and Procedures)* for information about items deleted or recoded for scaling.

() Standard errors appear in parentheses. Because of rounding some results may appear inconsistent.

SOURCE: IEA's Trends in International Mathematics and Science Study - TIMSS 2023
Downloaded from <https://timss2023.org/results>

Exhibit C.4: Average Scale Scores for the Science Test-Curriculum Matching Analysis

Results based on items identified by each country as addressed in its curriculum

(Continued)

Country	Average Science Scale Score based on All Items	Norway (9)	France	United Arab Emirates	Israel	Qatar	Romania	Cyprus	Oman	Chile	Bahrain
Singapore	606 (5.7)	609 (5.6)	610 (5.3)	606 (5.7)	603 (5.2)	613 (5.8)	608 (5.7)	603 (4.9)	605 (5.6)	604 (5.4)	606 (5.7)
Chinese Taipei	572 (2.4)	573 (2.4)	573 (2.3)	572 (2.4)	584 (2.4)	575 (2.5)	572 (2.4)	573 (2.3)	572 (2.4)	572 (2.4)	572 (2.4)
Japan	557 (3.1)	557 (3.1)	561 (3.2)	557 (3.1)	558 (3.1)	558 (3.1)	556 (3.1)	577 (3.3)	558 (3.1)	562 (3.0)	557 (3.1)
Korea, Rep. of	545 (2.2)	545 (2.2)	551 (2.3)	545 (2.2)	552 (2.3)	548 (2.2)	545 (2.3)	561 (2.5)	546 (2.2)	552 (2.3)	545 (2.3)
England	531 (4.3)	531 (4.3)	534 (4.4)	531 (4.3)	536 (4.4)	531 (4.4)	532 (4.4)	535 (4.5)	532 (4.4)	532 (4.4)	531 (4.3)
Finland	531 (3.2)	531 (3.2)	535 (3.4)	531 (3.2)	537 (3.4)	532 (3.3)	531 (3.2)	534 (3.7)	531 (3.2)	531 (3.3)	531 (3.2)
Türkiye	530 (3.6)	530 (3.6)	532 (3.7)	530 (3.6)	535 (3.6)	532 (3.7)	531 (3.6)	528 (3.5)	530 (3.6)	526 (3.5)	529 (3.6)
Hong Kong SAR	528 (4.7)	529 (4.7)	531 (4.7)	528 (4.7)	532 (4.6)	529 (4.8)	527 (4.7)	536 (4.4)	528 (4.7)	530 (4.6)	528 (4.7)
Czech Republic	527 (2.0)	528 (2.0)	529 (1.9)	527 (2.0)	532 (2.0)	531 (2.0)	528 (2.0)	535 (2.2)	528 (2.0)	536 (2.1)	528 (2.0)
Ireland	525 (3.5)	526 (3.4)	529 (3.6)	525 (3.5)	532 (3.7)	523 (3.5)	525 (3.5)	533 (4.3)	525 (3.6)	526 (3.7)	525 (3.6)
Hungary	522 (3.3)	522 (3.3)	525 (3.1)	522 (3.3)	529 (3.3)	522 (3.4)	521 (3.3)	537 (3.3)	522 (3.3)	525 (3.3)	522 (3.3)
Sweden	521 (2.9)	523 (3.0)	529 (3.0)	521 (2.9)	527 (3.0)	522 (3.0)	522 (2.9)	525 (3.0)	521 (3.0)	521 (3.0)	521 (2.9)
Australia	520 (3.2)	520 (3.1)	521 (3.1)	520 (3.2)	526 (3.2)	519 (3.2)	520 (3.2)	528 (3.3)	520 (3.2)	523 (3.2)	520 (3.2)
Lithuania	519 (3.0)	520 (3.0)	524 (3.0)	519 (3.0)	524 (3.0)	520 (3.0)	521 (3.0)	523 (3.1)	520 (3.0)	522 (3.1)	519 (3.0)
United States	513 (3.9)	513 (3.8)	516 (3.9)	513 (3.9)	520 (3.8)	512 (3.8)	514 (3.9)	522 (3.9)	514 (3.9)	516 (3.9)	513 (3.9)
Austria	512 (2.4)	512 (2.4)	515 (2.5)	512 (2.4)	516 (2.4)	512 (2.4)	512 (2.4)	517 (2.4)	512 (2.4)	514 (2.4)	512 (2.4)
Portugal	506 (2.4)	507 (2.4)	513 (2.5)	506 (2.4)	511 (2.4)	507 (2.4)	506 (2.4)	516 (2.5)	506 (2.4)	511 (2.5)	506 (2.4)
New Zealand	502 (4.0)	503 (4.0)	504 (4.2)	502 (4.0)	506 (4.1)	499 (4.1)	502 (4.0)	504 (4.3)	502 (4.0)	502 (4.1)	502 (4.0)
Italy	501 (3.2)	501 (3.2)	508 (3.1)	501 (3.2)	509 (3.1)	498 (3.3)	500 (3.2)	516 (3.4)	502 (3.2)	506 (3.3)	501 (3.2)
Malta	501 (1.6)	503 (1.6)	506 (1.6)	501 (1.6)	505 (1.6)	502 (1.7)	502 (1.6)	509 (1.7)	501 (1.6)	501 (1.6)	501 (1.6)
Norway (9)	488 (2.6)	489 (2.6)	489 (2.6)	488 (2.6)	498 (2.6)	487 (2.6)	488 (2.6)	495 (2.4)	488 (2.6)	491 (2.6)	488 (2.6)
France	486 (3.2)	486 (3.2)	493 (3.3)	486 (3.2)	492 (3.3)	485 (3.2)	485 (3.2)	495 (3.5)	487 (3.2)	489 (3.3)	486 (3.2)
United Arab Emirates	486 (2.0)	488 (2.1)	489 (2.1)	486 (2.0)	494 (2.0)	490 (2.0)	488 (2.0)	491 (2.1)	487 (2.0)	488 (2.0)	486 (2.0)
Israel	481 (3.6)	479 (3.6)	485 (3.6)	481 (3.6)	488 (3.7)	485 (3.7)	482 (3.6)	479 (3.7)	481 (3.6)	483 (3.7)	480 (3.6)
Qatar	481 (4.3)	484 (4.3)	489 (4.2)	481 (4.3)	492 (4.3)	486 (4.3)	482 (4.3)	494 (4.3)	481 (4.3)	487 (4.2)	481 (4.3)
Romania	466 (4.1)	467 (4.0)	475 (3.9)	466 (4.1)	467 (4.2)	467 (4.1)	466 (4.1)	478 (4.0)	467 (4.1)	470 (4.1)	466 (4.0)
Cyprus	464 (3.0)	465 (3.0)	468 (2.9)	464 (3.0)	471 (2.8)	466 (2.9)	464 (3.0)	479 (2.9)	465 (3.0)	469 (3.0)	464 (3.0)
Oman	456 (2.6)	457 (2.6)	458 (2.7)	456 (2.6)	461 (2.7)	464 (2.6)	457 (2.6)	463 (2.8)	456 (2.6)	460 (2.6)	456 (2.6)
Chile	455 (2.7)	454 (2.7)	459 (2.6)	455 (2.7)	460 (2.8)	454 (2.7)	455 (2.7)	467 (2.7)	456 (2.7)	461 (2.7)	456 (2.7)
Bahrain	452 (2.6)	453 (2.7)	456 (2.8)	452 (2.6)	458 (2.8)	457 (2.6)	453 (2.6)	455 (3.0)	452 (2.7)	454 (2.7)	452 (2.6)
Georgia	448 (2.9)	449 (2.9)	455 (3.0)	448 (2.9)	451 (3.1)	451 (3.0)	449 (2.9)	459 (3.0)	448 (2.9)	451 (3.0)	448 (2.9)
Kazakhstan	443 (3.0)	443 (3.0)	444 (2.9)	443 (3.0)	446 (2.9)	447 (3.0)	445 (3.0)	442 (2.9)	443 (3.0)	443 (3.1)	443 (3.0)
Malaysia	426 (3.7)	428 (3.7)	434 (3.8)	426 (3.7)	428 (3.7)	428 (3.7)	427 (3.7)	434 (3.7)	426 (3.7)	429 (3.8)	426 (3.7)
Brazil	420 (2.5)	421 (2.5)	424 (2.5)	420 (2.5)	419 (2.5)	418 (2.5)	420 (2.5)	431 (2.7)	420 (2.5)	424 (2.6)	420 (2.5)
Saudi Arabia	419 (3.4)	419 (3.5)	425 (3.5)	419 (3.4)	429 (3.5)	422 (3.4)	419 (3.4)	429 (3.7)	419 (3.4)	423 (3.5)	420 (3.4)
Jordan	413 (3.6)	414 (3.7)	415 (3.8)	413 (3.6)	416 (3.8)	416 (3.7)	413 (3.6)	418 (3.7)	413 (3.6)	413 (3.7)	413 (3.6)
Uzbekistan	396 (3.7)	397 (3.8)	399 (3.8)	396 (3.7)	400 (4.0)	401 (3.8)	396 (3.7)	404 (4.0)	396 (3.7)	399 (3.9)	396 (3.7)
Palestinian Nat'l Auth.	393 (2.9)	394 (2.9)	396 (2.9)	393 (2.9)	398 (2.9)	400 (2.9)	395 (2.9)	397 (2.9)	393 (2.9)	397 (2.9)	394 (2.9)
Morocco	327 (3.4)	327 (3.4)	332 (3.6)	327 (3.4)	339 (3.4)	331 (3.4)	328 (3.4)	323 (4.0)	327 (3.4)	331 (3.5)	327 (3.4)
International Average	486 (0.5)	487 (0.5)	491 (0.5)	486 (0.5)	492 (0.5)	488 (0.5)	487 (0.5)	493 (0.5)	487 (0.5)	489 (0.5)	486 (0.5)
Benchmarking Participants											
Dubai, UAE	547 (3.2)	549 (3.2)	549 (3.3)	547 (3.2)	554 (3.2)	550 (3.1)	549 (3.2)	551 (3.3)	548 (3.2)	548 (3.1)	547 (3.2)
Sharjah, UAE	499 (4.9)	501 (5.0)	502 (5.0)	499 (4.9)	506 (4.9)	504 (4.9)	500 (4.9)	503 (5.0)	499 (4.9)	501 (4.9)	499 (4.9)
Abu Dhabi, UAE	443 (3.8)	444 (3.8)	447 (3.8)	443 (3.8)	452 (3.8)	447 (3.8)	445 (3.8)	447 (3.9)	444 (3.8)	446 (3.8)	444 (3.8)
Number of Items (Score Points)*	212 (230)	193 (210)	112 (122)	212 (230)	115 (125)	160 (175)	200 (217)	70 (78)	207 (224)	140 (153)	211 (229)

* The number of items and score points are based on the number of items included in scaling the eighth-grade science achievement data.

See Chapter 9 in *TIMSS 2023 Technical Report (Methods and Procedures)* for information about items deleted or recoded for scaling.

() Standard errors appear in parentheses. Because of rounding some results may appear inconsistent.

SOURCE: IEA's Trends in International Mathematics and Science Study - TIMSS 2023
Downloaded from <https://timss2023.org/results>

Exhibit C.4: Average Scale Scores for the Science Test-Curriculum Matching Analysis

Results based on items identified by each country as addressed in its curriculum

(Continued)

Country	Average Science Scale Score based on All Items	Georgia	Kazakhstan	Malaysia	Brazil	Saudi Arabia	Jordan	Uzbekistan	Palestinian Nat'l Auth.	Morocco
Singapore	606 (5.7)	608 (5.6)	606 (5.7)	607 (5.7)	604 (5.4)	606 (5.7)	605 (5.6)	606 (5.7)	608 (5.7)	614 (5.7)
Chinese Taipei	572 (2.4)	571 (2.4)	572 (2.4)	572 (2.4)	569 (2.3)	572 (2.4)	573 (2.4)	572 (2.4)	573 (2.4)	570 (2.3)
Japan	557 (3.1)	560 (3.1)	557 (3.1)	557 (3.1)	559 (3.3)	557 (3.1)	556 (3.1)	557 (3.1)	559 (3.1)	563 (3.1)
Korea, Rep. of	545 (2.2)	547 (2.3)	545 (2.2)	546 (2.2)	553 (2.3)	545 (2.2)	546 (2.2)	545 (2.3)	546 (2.2)	550 (2.3)
England	531 (4.3)	532 (4.4)	531 (4.3)	532 (4.3)	531 (4.4)	531 (4.3)	531 (4.3)	532 (4.3)	532 (4.3)	531 (4.3)
Finland	531 (3.2)	532 (3.3)	531 (3.2)	530 (3.2)	531 (3.4)	531 (3.2)	530 (3.2)	531 (3.2)	530 (3.2)	531 (3.3)
Türkiye	530 (3.6)	531 (3.7)	530 (3.6)	530 (3.6)	529 (3.6)	530 (3.6)	531 (3.6)	529 (3.6)	531 (3.6)	531 (3.5)
Hong Kong SAR	528 (4.7)	531 (4.7)	528 (4.7)	528 (4.8)	532 (4.7)	528 (4.7)	528 (4.7)	528 (4.7)	530 (4.7)	527 (4.8)
Czech Republic	527 (2.0)	529 (2.0)	527 (2.0)	527 (2.0)	530 (2.0)	527 (2.0)	527 (2.0)	527 (2.0)	528 (2.0)	530 (2.0)
Ireland	525 (3.5)	527 (3.5)	525 (3.5)	525 (3.5)	527 (3.7)	525 (3.5)	525 (3.6)	525 (3.5)	526 (3.5)	526 (3.6)
Hungary	522 (3.3)	524 (3.3)	522 (3.3)	522 (3.3)	525 (3.3)	522 (3.3)	522 (3.3)	522 (3.3)	524 (3.3)	525 (3.3)
Sweden	521 (2.9)	522 (2.9)	521 (2.9)	521 (2.9)	524 (3.1)	521 (2.9)	521 (2.9)	522 (2.9)	521 (3.0)	522 (3.0)
Australia	520 (3.2)	522 (3.2)	520 (3.2)	520 (3.2)	523 (3.2)	520 (3.2)	520 (3.2)	520 (3.2)	520 (3.2)	522 (3.2)
Lithuania	519 (3.0)	520 (3.0)	519 (3.0)	519 (3.0)	523 (3.0)	519 (3.0)	520 (3.0)	519 (3.0)	520 (3.1)	522 (3.0)
United States	513 (3.9)	513 (3.9)	513 (3.9)	513 (3.8)	515 (4.0)	513 (3.9)	514 (3.9)	513 (3.9)	513 (3.9)	516 (3.9)
Austria	512 (2.4)	516 (2.4)	512 (2.4)	511 (2.4)	513 (2.4)	512 (2.4)	512 (2.4)	512 (2.4)	513 (2.4)	512 (2.4)
Portugal	506 (2.4)	506 (2.4)	506 (2.4)	505 (2.4)	508 (2.4)	506 (2.4)	507 (2.4)	506 (2.4)	508 (2.4)	507 (2.4)
New Zealand	502 (4.0)	504 (4.1)	502 (4.0)	502 (4.0)	504 (4.2)	502 (4.0)	501 (4.0)	502 (4.0)	501 (4.0)	504 (4.2)
Italy	501 (3.2)	499 (3.2)	501 (3.2)	500 (3.2)	505 (3.2)	501 (3.2)	501 (3.2)	501 (3.2)	502 (3.2)	500 (3.2)
Malta	501 (1.6)	506 (1.6)	501 (1.6)	502 (1.6)	503 (1.6)	501 (1.6)	502 (1.6)	501 (1.6)	503 (1.6)	503 (1.6)
Norway (9)	488 (2.6)	490 (2.6)	488 (2.6)	488 (2.6)	489 (2.6)	488 (2.6)	487 (2.6)	489 (2.6)	489 (2.6)	491 (2.7)
France	486 (3.2)	487 (3.2)	486 (3.2)	485 (3.2)	488 (3.2)	486 (3.2)	487 (3.2)	486 (3.2)	487 (3.2)	490 (3.3)
United Arab Emirates	486 (2.0)	488 (2.0)	486 (2.0)	486 (2.0)	487 (2.0)	486 (2.0)	488 (2.1)	486 (2.0)	489 (2.0)	489 (2.0)
Israel	481 (3.6)	480 (3.7)	481 (3.6)	481 (3.6)	480 (3.6)	481 (3.6)	481 (3.6)	480 (3.6)	481 (3.6)	483 (3.7)
Qatar	481 (4.3)	484 (4.3)	481 (4.3)	482 (4.3)	485 (4.2)	481 (4.3)	483 (4.3)	481 (4.3)	485 (4.3)	486 (4.3)
Romania	466 (4.1)	466 (4.1)	466 (4.1)	466 (4.1)	470 (4.1)	466 (4.1)	468 (4.0)	466 (4.1)	467 (4.0)	470 (4.1)
Cyprus	464 (3.0)	466 (3.0)	464 (3.0)	464 (3.0)	467 (3.0)	464 (3.0)	465 (3.0)	464 (3.0)	466 (2.9)	468 (2.9)
Oman	456 (2.6)	457 (2.6)	456 (2.6)	457 (2.6)	459 (2.6)	456 (2.6)	458 (2.6)	456 (2.6)	459 (2.7)	461 (2.6)
Chile	455 (2.7)	455 (2.7)	455 (2.7)	455 (2.7)	458 (2.7)	455 (2.7)	455 (2.7)	455 (2.7)	454 (2.7)	457 (2.7)
Bahrain	452 (2.6)	453 (2.7)	452 (2.6)	453 (2.6)	454 (2.7)	452 (2.6)	453 (2.7)	452 (2.6)	453 (2.7)	457 (2.7)
Georgia	448 (2.9)	450 (2.9)	448 (2.9)	448 (2.9)	449 (2.9)	448 (2.9)	449 (2.9)	448 (2.9)	449 (3.0)	452 (2.9)
Kazakhstan	443 (3.0)	446 (3.0)	443 (3.0)	442 (3.0)	443 (2.9)	443 (3.0)	443 (3.0)	443 (3.0)	444 (3.0)	448 (2.9)
Malaysia	426 (3.7)	428 (3.7)	426 (3.7)	427 (3.7)	429 (3.7)	426 (3.7)	427 (3.7)	426 (3.7)	427 (3.7)	429 (3.7)
Brazil	420 (2.5)	418 (2.5)	420 (2.5)	420 (2.5)	427 (2.5)	420 (2.5)	420 (2.5)	420 (2.5)	420 (2.5)	421 (2.5)
Saudi Arabia	419 (3.4)	420 (3.4)	419 (3.4)	420 (3.4)	422 (3.4)	419 (3.4)	419 (3.5)	419 (3.4)	420 (3.5)	423 (3.5)
Jordan	413 (3.6)	415 (3.6)	413 (3.6)	414 (3.6)	416 (3.6)	413 (3.6)	414 (3.7)	412 (3.6)	414 (3.7)	418 (3.6)
Uzbekistan	396 (3.7)	399 (3.8)	396 (3.7)	395 (3.7)	397 (3.8)	396 (3.7)	397 (3.7)	396 (3.7)	398 (3.8)	402 (3.8)
Palestinian Nat'l Auth.	393 (2.9)	397 (2.8)	393 (2.9)	394 (2.9)	395 (2.9)	393 (2.9)	395 (2.9)	393 (2.9)	396 (2.9)	400 (2.8)
Morocco	327 (3.4)	330 (3.4)	327 (3.4)	327 (3.4)	328 (3.5)	327 (3.4)	328 (3.4)	327 (3.4)	330 (3.4)	330 (3.5)
International Average	486 (0.5)	488 (0.5)	486 (0.5)	486 (0.5)	488 (0.5)	486 (0.5)	487 (0.5)	486 (0.5)	488 (0.5)	489 (0.5)
Benchmarking Participants										
Dubai, UAE	547 (3.2)	548 (3.2)	547 (3.2)	547 (3.2)	547 (3.2)	547 (3.2)	549 (3.2)	547 (3.2)	549 (3.2)	548 (3.1)
Sharjah, UAE	499 (4.9)	500 (4.8)	499 (4.9)	499 (5.0)	499 (5.0)	499 (4.9)	501 (5.0)	499 (4.9)	501 (5.0)	503 (4.9)
Abu Dhabi, UAE	443 (3.8)	446 (3.7)	443 (3.8)	444 (3.7)	445 (3.8)	443 (3.8)	445 (3.8)	444 (3.8)	446 (3.8)	446 (3.8)
Number of Items (Score Points)*	212 (230)	173 (189)	212 (230)	205 (223)	151 (162)	212 (230)	198 (213)	210 (228)	186 (202)	141 (153)

* The number of items and score points are based on the number of items included in scaling the eighth-grade science achievement data.

See Chapter 9 in *TIMSS 2023 Technical Report (Methods and Procedures)* for information about items deleted or recoded for scaling.

() Standard errors appear in parentheses. Because of rounding some results may appear inconsistent.

SOURCE: IEA's Trends in International Mathematics and Science Study - TIMSS 2023
Downloaded from <https://timss2023.org/results>

Exhibit C.4: Average Scale Scores for the Science Test-Curriculum Matching Analysis

Results based on items identified by each country as addressed in its curriculum

(Continued)

Country	Average Science Scale Score based on All Items	Benchmarking Participants	Dubai, UAE	Sharjah, UAE	Abu Dhabi, UAE
Singapore	606 (5.7)		606 (5.7)	606 (5.7)	606 (5.7)
Chinese Taipei	572 (2.4)		572 (2.4)	572 (2.4)	572 (2.4)
Japan	557 (3.1)		557 (3.1)	557 (3.1)	557 (3.1)
Korea, Rep. of	545 (2.2)		545 (2.2)	545 (2.2)	545 (2.2)
England	531 (4.3)		531 (4.3)	531 (4.3)	531 (4.3)
Finland	531 (3.2)		531 (3.2)	531 (3.2)	531 (3.2)
Türkiye	530 (3.6)		530 (3.6)	530 (3.6)	530 (3.6)
Hong Kong SAR	528 (4.7)		528 (4.7)	528 (4.7)	528 (4.7)
Czech Republic	527 (2.0)		527 (2.0)	527 (2.0)	527 (2.0)
Ireland	525 (3.5)		525 (3.5)	525 (3.5)	525 (3.5)
Hungary	522 (3.3)		522 (3.3)	522 (3.3)	522 (3.3)
Sweden	521 (2.9)		521 (2.9)	521 (2.9)	521 (2.9)
Australia	520 (3.2)		520 (3.2)	520 (3.2)	520 (3.2)
Lithuania	519 (3.0)		519 (3.0)	519 (3.0)	519 (3.0)
United States	513 (3.9)		513 (3.9)	513 (3.9)	513 (3.9)
Austria	512 (2.4)		512 (2.4)	512 (2.4)	512 (2.4)
Portugal	506 (2.4)		506 (2.4)	506 (2.4)	506 (2.4)
New Zealand	502 (4.0)		502 (4.0)	502 (4.0)	502 (4.0)
Italy	501 (3.2)		501 (3.2)	501 (3.2)	501 (3.2)
Malta	501 (1.6)		501 (1.6)	501 (1.6)	501 (1.6)
Norway (9)	488 (2.6)		488 (2.6)	488 (2.6)	488 (2.6)
France	486 (3.2)		486 (3.2)	486 (3.2)	486 (3.2)
United Arab Emirates	486 (2.0)		486 (2.0)	486 (2.0)	486 (2.0)
Israel	481 (3.6)		481 (3.6)	481 (3.6)	481 (3.6)
Qatar	481 (4.3)		481 (4.3)	481 (4.3)	481 (4.3)
Romania	466 (4.1)		466 (4.1)	466 (4.1)	466 (4.1)
Cyprus	464 (3.0)		464 (3.0)	464 (3.0)	464 (3.0)
Oman	456 (2.6)		456 (2.6)	456 (2.6)	456 (2.6)
Chile	455 (2.7)		455 (2.7)	455 (2.7)	455 (2.7)
Bahrain	452 (2.6)		452 (2.6)	452 (2.6)	452 (2.6)
Georgia	448 (2.9)		448 (2.9)	448 (2.9)	448 (2.9)
Kazakhstan	443 (3.0)		443 (3.0)	443 (3.0)	443 (3.0)
Malaysia	426 (3.7)		426 (3.7)	426 (3.7)	426 (3.7)
Brazil	420 (2.5)		420 (2.5)	420 (2.5)	420 (2.5)
Saudi Arabia	419 (3.4)		419 (3.4)	419 (3.4)	419 (3.4)
Jordan	413 (3.6)		413 (3.6)	413 (3.6)	413 (3.6)
Uzbekistan	396 (3.7)		396 (3.7)	396 (3.7)	396 (3.7)
Palestinian Nat'l Auth.	393 (2.9)		393 (2.9)	393 (2.9)	393 (2.9)
Morocco	327 (3.4)		327 (3.4)	327 (3.4)	327 (3.4)
International Average	486 (0.5)		486 (0.5)	486 (0.5)	486 (0.5)
Benchmarking Participants					
Dubai, UAE	547 (3.2)		547 (3.2)	547 (3.2)	547 (3.2)
Sharjah, UAE	499 (4.9)		499 (4.9)	499 (4.9)	499 (4.9)
Abu Dhabi, UAE	443 (3.8)		443 (3.8)	443 (3.8)	443 (3.8)
Number of Items (Score Points)*	212 (230)		212 (230)	212 (230)	212 (230)

* The number of items and score points are based on the number of items included in scaling the eighth-grade science achievement data.

See Chapter 9 in *TIMSS 2023 Technical Report (Methods and Procedures)* for information about items deleted or recoded for scaling.

() Standard errors appear in parentheses. Because of rounding some results may appear inconsistent.

SOURCE: IEA's Trends in International Mathematics and Science Study - TIMSS 2023
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APPENDIX D: Percentiles of Achievement

Exhibit D.1: Percentiles of Mathematics Achievement

Country	5 th Percentile	10 th Percentile	25 th Percentile	50 th Percentile	75 th Percentile	90 th Percentile	95 th Percentile
Albania	372 (9.5)	404 (8.0)	458 (5.7)	515 (5.8)	566 (5.3)	614 (7.4)	642 (8.8)
Armenia	388 (4.9)	418 (5.5)	468 (4.2)	519 (2.9)	560 (3.3)	596 (3.6)	618 (4.3)
Australia	366 (5.8)	403 (5.2)	465 (3.9)	530 (3.9)	588 (3.5)	638 (3.5)	668 (3.4)
Azerbaijan	334 (7.3)	368 (5.9)	433 (4.8)	502 (3.9)	560 (3.6)	606 (3.9)	632 (4.1)
Bahrain	298 (6.4)	332 (5.7)	393 (5.1)	464 (4.9)	530 (5.5)	588 (7.0)	622 (8.8)
Belgium (Flemish)	402 (5.1)	428 (4.2)	471 (3.6)	523 (2.7)	571 (2.6)	611 (2.6)	634 (2.6)
Belgium (French)	364 (4.6)	390 (4.2)	437 (3.3)	491 (3.6)	542 (2.6)	586 (2.1)	611 (3.7)
Bosnia & Herzegovina	319 (7.2)	347 (6.2)	397 (4.6)	451 (3.7)	498 (3.1)	541 (4.7)	565 (4.9)
Brazil	259 (3.8)	286 (3.7)	336 (3.1)	397 (3.5)	462 (4.7)	520 (6.2)	549 (8.2)
Bulgaria	365 (9.8)	406 (9.7)	473 (5.2)	539 (3.5)	595 (2.9)	638 (3.6)	664 (4.9)
Canada	368 (3.2)	399 (2.7)	450 (3.2)	505 (2.4)	559 (2.4)	605 (2.7)	633 (3.3)
Chile	307 (5.1)	338 (4.4)	388 (4.9)	445 (3.3)	500 (2.8)	546 (2.3)	574 (3.4)
Chinese Taipei	491 (3.5)	520 (3.2)	565 (2.0)	610 (2.1)	652 (1.8)	690 (2.7)	712 (3.2)
Cyprus	373 (5.6)	406 (4.7)	464 (3.1)	523 (2.3)	573 (2.4)	616 (2.5)	641 (3.8)
Czech Republic	403 (4.1)	433 (2.8)	482 (2.7)	534 (2.1)	581 (2.6)	622 (3.6)	646 (3.4)
Denmark	403 (4.1)	429 (4.2)	476 (2.8)	526 (2.6)	573 (2.2)	614 (3.2)	638 (3.2)
England	393 (5.9)	430 (4.5)	493 (4.1)	557 (3.4)	616 (2.4)	666 (4.9)	695 (5.1)
Finland	391 (6.5)	426 (4.3)	478 (3.5)	533 (3.0)	585 (3.2)	627 (3.1)	652 (3.8)
France	353 (5.1)	382 (3.4)	431 (4.3)	488 (3.6)	539 (3.4)	580 (3.5)	604 (4.3)
Georgia	358 (6.3)	391 (4.7)	446 (3.7)	502 (3.3)	553 (3.1)	596 (4.7)	621 (5.4)
Germany	393 (5.6)	424 (4.2)	475 (3.1)	527 (2.2)	576 (2.2)	619 (2.6)	643 (4.4)
Hong Kong SAR	440 (9.0)	482 (6.2)	547 (5.2)	602 (4.0)	651 (4.8)	693 (5.9)	718 (7.3)
Hungary	355 (11.9)	395 (8.2)	462 (5.9)	530 (3.9)	585 (2.8)	630 (3.2)	656 (4.2)
Iran, Islamic Rep. of	250 (7.4)	288 (7.0)	353 (5.9)	426 (4.5)	491 (4.2)	541 (4.0)	569 (4.0)
Ireland	401 (6.4)	435 (5.1)	495 (5.1)	554 (3.0)	604 (2.9)	643 (2.7)	667 (4.3)
Italy	375 (5.3)	406 (5.0)	461 (3.8)	517 (3.4)	570 (2.6)	613 (3.2)	638 (3.3)
Japan	472 (4.9)	499 (2.9)	545 (3.1)	593 (2.9)	639 (3.3)	680 (4.4)	704 (4.4)
Jordan	263 (7.7)	296 (6.0)	356 (6.0)	426 (5.9)	498 (7.1)	560 (10.1)	595 (10.2)
Kazakhstan	340 (6.8)	373 (5.4)	428 (3.7)	490 (3.4)	549 (4.4)	597 (4.1)	624 (6.2)
Korea, Rep. of	462 (7.0)	496 (4.9)	549 (3.3)	599 (2.5)	645 (2.9)	686 (3.5)	711 (4.2)
Kosovo	320 (6.7)	347 (5.1)	396 (3.7)	452 (3.4)	507 (3.7)	556 (4.0)	584 (4.1)
Kuwait	190 (8.8)	230 (6.4)	299 (5.8)	384 (4.7)	464 (4.9)	531 (6.5)	567 (7.2)
Latvia	400 (5.3)	430 (5.3)	483 (4.3)	537 (3.8)	590 (3.5)	632 (3.7)	655 (5.5)
Lithuania	426 (4.8)	460 (4.4)	512 (4.4)	566 (2.9)	614 (2.7)	655 (3.1)	679 (4.0)
Macao SAR	444 (3.8)	477 (2.7)	533 (1.6)	587 (1.3)	636 (1.8)	679 (1.9)	704 (3.5)
Montenegro	346 (4.7)	375 (3.9)	428 (2.9)	481 (2.7)	530 (2.4)	570 (2.6)	594 (3.4)
Morocco	230 (4.8)	262 (5.9)	322 (5.3)	390 (5.0)	463 (5.9)	527 (7.0)	566 (8.8)
Netherlands	426 (5.2)	452 (3.9)	494 (3.1)	540 (2.7)	583 (2.1)	618 (3.1)	638 (3.3)
New Zealand	338 (5.1)	371 (5.1)	427 (4.0)	492 (3.7)	555 (3.5)	607 (2.9)	635 (2.7)
North Macedonia	329 (6.9)	358 (5.6)	414 (4.6)	478 (4.3)	536 (3.3)	581 (3.8)	606 (5.4)
Norway (5)	404 (4.1)	434 (4.1)	481 (3.0)	534 (2.1)	582 (2.4)	623 (2.4)	646 (3.4)
Oman	267 (5.2)	298 (4.5)	350 (3.8)	418 (4.4)	489 (5.3)	552 (6.8)	590 (8.8)
Poland	411 (3.6)	445 (4.2)	498 (2.8)	551 (2.3)	598 (2.4)	640 (3.5)	662 (4.0)
Portugal	378 (4.3)	407 (5.5)	460 (4.1)	521 (3.1)	576 (2.5)	620 (2.7)	646 (4.6)
Qatar	303 (5.2)	336 (4.2)	395 (5.2)	466 (3.9)	533 (4.2)	590 (3.8)	620 (4.3)
Romania	389 (10.3)	423 (8.6)	487 (7.2)	550 (5.0)	601 (4.5)	645 (4.3)	672 (5.0)
Saudi Arabia	268 (5.8)	299 (6.1)	352 (4.0)	419 (5.6)	486 (5.0)	542 (5.2)	573 (4.8)
Serbia	382 (6.0)	414 (6.3)	471 (4.2)	529 (3.6)	578 (3.3)	619 (3.0)	645 (5.4)
Singapore	450 (7.4)	496 (5.9)	565 (5.0)	624 (3.3)	675 (3.2)	719 (2.8)	743 (4.2)
Slovak Republic	363 (8.6)	404 (8.2)	469 (4.4)	524 (3.2)	572 (3.1)	610 (3.1)	632 (3.9)
Slovenia	390 (3.4)	417 (3.2)	465 (2.3)	516 (2.6)	565 (2.4)	605 (2.5)	628 (3.8)
South Africa (5)	193 (4.8)	222 (3.9)	277 (3.7)	352 (4.2)	438 (4.5)	518 (7.3)	566 (9.0)
Spain	372 (4.9)	401 (4.0)	447 (3.1)	500 (2.4)	551 (2.0)	594 (2.3)	619 (3.4)
Sweden	399 (6.6)	430 (5.3)	480 (4.1)	533 (2.9)	583 (2.4)	625 (2.9)	650 (4.4)
Türkiye (5)	378 (6.8)	419 (6.1)	489 (6.1)	561 (4.4)	622 (3.8)	673 (4.9)	706 (6.7)
United Arab Emirates	314 (2.0)	350 (2.2)	423 (2.1)	506 (1.6)	576 (1.3)	630 (1.6)	662 (1.7)
United States	348 (4.4)	384 (4.6)	451 (4.0)	523 (3.6)	587 (3.3)	637 (3.5)	667 (4.4)
Uzbekistan	311 (5.8)	338 (4.3)	387 (3.8)	442 (3.5)	500 (4.2)	551 (4.6)	579 (4.7)
Benchmarking Participants							
Ontario, Canada	367 (5.3)	397 (5.3)	448 (4.4)	504 (3.9)	559 (4.3)	606 (4.0)	634 (5.9)
Quebec, Canada	390 (4.8)	418 (3.7)	465 (3.5)	517 (3.4)	566 (3.0)	608 (2.7)	632 (3.3)
Abu Dhabi, UAE	284 (3.0)	315 (3.1)	376 (3.0)	460 (2.8)	540 (2.3)	599 (2.8)	632 (2.7)
Dubai, UAE	390 (4.5)	434 (3.5)	502 (2.7)	565 (1.8)	618 (1.6)	666 (2.3)	695 (3.7)
Sharjah, UAE	336 (4.1)	374 (5.0)	441 (5.2)	511 (3.6)	572 (4.3)	622 (4.9)	652 (5.9)

Percentiles are defined in terms of percentages of students at or below a point on the scale.
() Standard errors appear in parentheses. Because of rounding some results may appear inconsistent.

SOURCE: IEA's Trends in International Mathematics and Science Study - TIMSS 2023
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Exhibit D.2: Percentiles of Science Achievement

Country	5 th Percentile	10 th Percentile	25 th Percentile	50 th Percentile	75 th Percentile	90 th Percentile	95 th Percentile
Albania	360 (9.1)	389 (9.2)	440 (5.9)	494 (4.4)	543 (5.7)	587 (6.8)	609 (6.4)
Armenia	352 (6.1)	377 (4.8)	418 (3.6)	460 (2.8)	498 (2.8)	533 (2.7)	555 (4.6)
Australia	403 (7.4)	443 (4.8)	500 (3.6)	554 (2.6)	605 (3.0)	648 (2.6)	673 (3.2)
Azerbaijan	286 (5.2)	316 (5.1)	368 (4.5)	426 (3.5)	478 (3.8)	522 (4.4)	547 (4.1)
Bahrain	292 (6.4)	333 (7.4)	405 (5.0)	479 (4.3)	549 (4.8)	607 (5.4)	641 (7.4)
Belgium (Flemish)	362 (7.9)	390 (5.6)	440 (3.6)	492 (3.4)	540 (2.7)	579 (2.2)	601 (3.1)
Belgium (French)	350 (6.2)	379 (4.7)	429 (3.8)	483 (3.2)	535 (2.6)	578 (2.9)	603 (3.5)
Bosnia & Herzegovina	323 (7.6)	352 (6.8)	401 (6.1)	452 (3.4)	499 (3.5)	538 (2.6)	561 (4.8)
Brazil	268 (3.7)	299 (3.9)	358 (3.4)	428 (3.8)	492 (4.3)	547 (6.5)	578 (8.6)
Bulgaria	333 (14.4)	382 (13.6)	468 (8.3)	546 (4.7)	603 (3.7)	648 (4.5)	676 (4.2)
Canada	392 (3.6)	422 (2.8)	472 (2.8)	524 (1.9)	572 (2.6)	616 (2.4)	642 (2.5)
Chile	339 (5.4)	372 (5.0)	427 (3.7)	483 (3.0)	536 (2.7)	579 (4.0)	604 (3.0)
Chinese Taipei	449 (5.2)	480 (3.9)	528 (2.2)	576 (2.4)	621 (2.1)	660 (2.4)	683 (3.0)
Cyprus	330 (6.1)	367 (5.0)	431 (4.0)	494 (3.5)	549 (3.2)	594 (2.8)	619 (3.2)
Czech Republic	404 (5.2)	434 (3.3)	480 (2.7)	529 (2.5)	574 (2.9)	614 (2.9)	638 (4.6)
Denmark	391 (3.3)	422 (4.4)	474 (3.3)	526 (2.7)	574 (3.4)	615 (3.7)	639 (5.2)
England	416 (7.2)	452 (5.0)	507 (3.0)	560 (3.1)	610 (3.3)	655 (4.2)	681 (6.4)
Finland	396 (7.5)	437 (5.2)	497 (3.8)	550 (2.7)	596 (2.8)	635 (3.2)	658 (4.0)
France	360 (6.0)	390 (5.3)	439 (4.5)	492 (3.4)	540 (3.3)	579 (2.6)	603 (3.9)
Georgia	341 (5.5)	371 (5.0)	418 (4.6)	467 (3.3)	513 (2.9)	555 (4.6)	582 (6.4)
Germany	369 (7.5)	405 (4.6)	463 (3.8)	520 (2.9)	574 (2.9)	620 (4.2)	644 (4.0)
Hong Kong SAR	386 (9.6)	431 (6.7)	494 (5.0)	552 (3.8)	604 (4.1)	649 (6.4)	678 (8.8)
Hungary	370 (7.8)	409 (7.9)	472 (5.1)	532 (3.5)	583 (3.3)	625 (3.4)	651 (4.8)
Iran, Islamic Rep. of	237 (8.5)	281 (7.2)	358 (6.8)	442 (5.0)	514 (4.2)	566 (3.9)	594 (3.9)
Ireland	384 (7.0)	423 (6.0)	484 (4.3)	541 (4.2)	587 (3.1)	627 (3.5)	650 (3.4)
Italy	389 (4.9)	419 (4.0)	465 (3.6)	514 (2.9)	559 (2.5)	597 (2.7)	621 (3.2)
Japan	439 (4.1)	467 (5.4)	511 (2.5)	557 (2.4)	601 (3.2)	641 (4.2)	664 (5.0)
Jordan	246 (8.1)	280 (5.2)	347 (6.1)	421 (6.0)	491 (5.6)	549 (7.5)	582 (7.5)
Kazakhstan	314 (5.3)	348 (5.1)	403 (4.7)	467 (4.2)	531 (4.0)	585 (6.3)	615 (6.2)
Korea, Rep. of	458 (7.6)	491 (5.6)	539 (3.2)	587 (2.7)	632 (2.6)	674 (3.7)	697 (3.6)
Kosovo	280 (6.5)	306 (5.8)	353 (4.4)	404 (3.8)	454 (4.7)	499 (3.5)	523 (5.3)
Kuwait	164 (7.7)	206 (7.7)	283 (6.6)	376 (7.1)	466 (6.3)	536 (9.0)	575 (9.0)
Latvia	393 (7.9)	421 (6.0)	475 (4.6)	530 (3.6)	579 (3.4)	622 (3.9)	647 (3.6)
Lithuania	407 (7.9)	440 (5.4)	491 (4.3)	542 (2.7)	587 (2.9)	627 (3.0)	651 (4.6)
Macao SAR	395 (5.3)	432 (3.0)	485 (1.7)	541 (2.0)	591 (2.0)	635 (2.2)	660 (3.8)
Montenegro	328 (3.9)	362 (4.8)	413 (2.7)	465 (2.4)	513 (2.5)	552 (2.2)	576 (3.5)
Morocco	196 (6.5)	236 (5.5)	307 (4.6)	391 (6.3)	475 (6.6)	545 (9.6)	582 (7.6)
Netherlands	403 (5.9)	430 (4.2)	473 (3.9)	520 (4.2)	563 (2.2)	600 (2.9)	621 (3.7)
New Zealand	364 (7.0)	399 (5.1)	461 (4.2)	523 (3.9)	579 (3.5)	623 (2.6)	648 (3.0)
North Macedonia	293 (8.0)	324 (6.4)	378 (5.9)	441 (4.5)	500 (3.5)	548 (3.4)	575 (4.2)
Norway (5)	397 (4.4)	430 (4.0)	482 (3.7)	536 (2.7)	583 (2.8)	622 (3.4)	646 (4.2)
Oman	262 (7.1)	298 (6.0)	361 (4.6)	433 (4.4)	503 (4.6)	565 (6.3)	601 (7.9)
Poland	425 (5.5)	458 (3.5)	505 (3.1)	554 (2.5)	599 (2.7)	637 (3.2)	659 (3.1)
Portugal	384 (4.5)	414 (3.8)	463 (3.7)	514 (2.8)	561 (2.2)	601 (2.1)	624 (3.0)
Qatar	294 (5.0)	331 (4.7)	400 (4.6)	477 (4.4)	548 (3.9)	604 (4.2)	634 (4.1)
Romania	382 (8.6)	417 (8.1)	475 (6.9)	532 (4.7)	582 (4.7)	624 (6.9)	650 (6.4)
Saudi Arabia	262 (7.3)	296 (5.6)	357 (5.2)	429 (5.6)	499 (4.1)	557 (4.8)	588 (5.9)
Serbia	379 (7.8)	412 (5.7)	463 (4.1)	514 (3.6)	562 (3.3)	601 (3.5)	624 (4.2)
Singapore	453 (7.8)	497 (4.9)	559 (3.3)	614 (2.8)	666 (2.5)	708 (2.3)	733 (3.1)
Slovak Republic	353 (9.8)	401 (9.5)	474 (4.9)	532 (3.6)	581 (3.0)	619 (3.3)	641 (3.9)
Slovenia	396 (4.5)	427 (4.2)	476 (4.2)	530 (3.0)	577 (2.7)	618 (3.2)	641 (3.5)
South Africa (5)	81 (5.7)	121 (4.7)	192 (4.4)	291 (5.2)	416 (8.1)	523 (10.6)	581 (12.7)
Spain	382 (5.0)	411 (3.3)	457 (3.1)	507 (2.8)	554 (2.4)	594 (2.9)	617 (3.2)
Sweden	386 (8.9)	422 (7.2)	481 (4.7)	538 (2.8)	589 (3.0)	633 (2.9)	659 (3.4)
Türkiye (5)	415 (7.7)	455 (6.1)	518 (4.2)	577 (3.8)	628 (3.0)	673 (4.0)	700 (5.1)
United Arab Emirates	282 (3.2)	326 (3.1)	415 (2.8)	508 (1.9)	581 (1.5)	638 (1.9)	670 (2.3)
United States	360 (5.2)	404 (5.8)	475 (3.6)	541 (3.2)	598 (3.2)	645 (2.8)	672 (3.7)
Uzbekistan	274 (6.4)	304 (5.2)	354 (4.7)	412 (3.9)	470 (3.6)	520 (3.9)	548 (4.1)
Benchmarking Participants							
Ontario, Canada	395 (4.6)	426 (4.2)	477 (5.0)	528 (3.5)	576 (3.4)	620 (3.8)	645 (5.9)
Quebec, Canada	387 (6.9)	414 (4.3)	461 (4.7)	511 (2.6)	556 (3.6)	596 (2.7)	619 (3.4)
Abu Dhabi, UAE	244 (3.9)	278 (3.9)	348 (3.7)	452 (4.0)	543 (2.9)	607 (2.8)	639 (3.0)
Dubai, UAE	388 (5.6)	437 (4.4)	508 (2.8)	571 (1.9)	627 (1.9)	674 (2.7)	702 (4.9)
Sharjah, UAE	316 (6.2)	359 (5.8)	437 (4.7)	510 (3.9)	576 (4.7)	632 (5.5)	664 (6.6)

Percentiles are defined in terms of percentages of students at or below a point on the scale.
() Standard errors appear in parentheses. Because of rounding some results may appear inconsistent.

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Exhibit D.3: Percentiles of Mathematics Achievement

Country	5 th Percentile	10 th Percentile	25 th Percentile	50 th Percentile	75 th Percentile	90 th Percentile	95 th Percentile
Australia	351 (7.8)	387 (6.5)	444 (4.6)	510 (4.1)	575 (3.7)	628 (4.3)	659 (4.7)
Austria	385 (6.3)	414 (4.9)	464 (3.9)	516 (2.4)	563 (3.0)	604 (3.4)	627 (3.9)
Azerbaijan	305 (7.6)	343 (6.6)	409 (5.2)	483 (4.6)	553 (4.4)	607 (4.5)	637 (5.7)
Bahrain	275 (3.8)	303 (3.0)	354 (4.2)	420 (3.1)	493 (3.7)	556 (4.5)	596 (4.6)
Brazil	243 (2.8)	269 (2.8)	316 (2.3)	372 (2.6)	434 (3.8)	495 (6.7)	532 (9.1)
Chile	283 (6.3)	310 (5.6)	358 (4.8)	414 (3.7)	472 (3.0)	526 (4.0)	557 (5.2)
Chinese Taipei	425 (4.5)	466 (5.7)	541 (4.0)	611 (3.3)	670 (4.0)	721 (3.5)	752 (5.0)
Cote d'Ivoire	148 (4.1)	172 (3.7)	212 (3.6)	258 (3.6)	309 (5.3)	361 (12.3)	397 (17.1)
Cyprus	337 (5.1)	370 (3.0)	431 (3.5)	497 (3.3)	559 (4.2)	610 (5.6)	638 (6.9)
Czech Republic	381 (4.7)	411 (4.3)	461 (3.7)	518 (2.5)	575 (2.5)	625 (3.0)	655 (4.1)
England	353 (8.4)	391 (7.1)	461 (6.2)	532 (5.5)	593 (5.5)	645 (6.5)	676 (6.6)
Finland	368 (5.5)	398 (4.4)	448 (3.2)	505 (3.1)	560 (2.8)	609 (3.5)	637 (3.5)
France	342 (6.4)	372 (5.4)	423 (3.9)	481 (3.6)	536 (3.3)	582 (3.5)	608 (4.2)
Georgia	318 (5.4)	348 (4.5)	400 (4.0)	466 (5.1)	532 (3.9)	586 (4.3)	615 (5.2)
Hong Kong SAR	399 (8.8)	440 (9.7)	517 (6.0)	584 (4.5)	641 (5.5)	690 (9.1)	721 (10.9)
Hungary	350 (7.4)	386 (6.8)	446 (4.8)	511 (3.9)	572 (4.0)	619 (4.9)	646 (4.5)
Iran, Islamic Rep. of	279 (7.6)	308 (6.0)	361 (4.3)	421 (3.6)	485 (4.2)	540 (5.0)	573 (7.2)
Ireland	385 (7.0)	416 (4.2)	469 (3.9)	526 (2.6)	577 (2.7)	621 (2.5)	646 (3.5)
Israel	322 (6.5)	356 (4.9)	416 (4.6)	490 (4.4)	558 (4.7)	614 (7.6)	648 (7.5)
Italy	360 (5.3)	390 (5.2)	442 (4.4)	501 (3.5)	562 (3.1)	609 (3.0)	637 (4.4)
Japan	451 (4.4)	484 (3.4)	539 (4.3)	598 (4.2)	653 (4.0)	701 (4.9)	728 (5.4)
Jordan	247 (5.1)	276 (5.2)	326 (3.7)	388 (4.0)	449 (3.8)	502 (4.4)	535 (6.6)
Kazakhstan	311 (6.5)	339 (4.5)	389 (3.7)	449 (4.3)	515 (4.9)	578 (6.4)	613 (7.2)
Korea, Rep. of	418 (5.2)	463 (4.6)	536 (4.2)	603 (3.3)	663 (3.2)	716 (4.6)	747 (5.0)
Kuwait	253 (6.5)	282 (5.7)	332 (5.0)	392 (4.9)	459 (7.1)	530 (11.6)	568 (10.9)
Lithuania	362 (4.5)	392 (4.8)	449 (4.1)	516 (3.6)	577 (3.5)	631 (4.1)	664 (5.6)
Malaysia	278 (4.5)	303 (3.9)	349 (3.9)	404 (4.1)	465 (3.7)	530 (5.4)	567 (5.7)
Malta	343 (4.1)	377 (3.3)	439 (2.2)	507 (2.4)	563 (2.6)	610 (3.3)	636 (4.2)
Morocco	263 (3.9)	287 (3.3)	325 (3.0)	372 (3.4)	427 (3.6)	479 (4.7)	511 (5.0)
New Zealand	330 (6.1)	360 (4.3)	417 (4.6)	485 (4.8)	553 (6.5)	612 (6.9)	643 (6.9)
Norway (9)	361 (3.5)	391 (4.4)	445 (3.0)	503 (3.0)	559 (2.5)	606 (2.8)	631 (2.8)
Oman	267 (3.6)	295 (3.6)	345 (3.5)	408 (3.0)	473 (3.4)	531 (3.7)	565 (4.3)
Palestinian Nat'l Auth.	240 (2.9)	268 (4.0)	318 (3.1)	379 (3.5)	443 (3.6)	501 (4.6)	532 (4.6)
Portugal	343 (5.4)	370 (4.1)	416 (3.5)	473 (3.1)	534 (3.2)	587 (3.8)	614 (3.9)
Qatar	293 (5.4)	322 (6.0)	378 (5.5)	450 (5.2)	521 (5.7)	584 (6.2)	622 (9.8)
Romania	322 (10.8)	362 (8.1)	429 (7.2)	501 (5.6)	567 (5.1)	619 (5.6)	650 (7.2)
Saudi Arabia	268 (4.3)	292 (4.0)	337 (3.8)	392 (3.7)	452 (3.9)	507 (4.5)	541 (4.4)
Singapore	422 (11.1)	469 (14.4)	546 (9.5)	617 (5.6)	673 (4.8)	720 (5.1)	748 (5.8)
South Africa (9)	280 (3.8)	303 (3.4)	344 (3.1)	391 (2.9)	442 (3.7)	497 (7.9)	537 (10.4)
Sweden	378 (3.7)	408 (3.4)	460 (2.8)	521 (3.5)	575 (3.3)	621 (3.6)	647 (4.8)
Türkiye	326 (8.4)	360 (5.8)	423 (4.7)	507 (6.2)	595 (6.2)	659 (6.5)	695 (6.7)
United Arab Emirates	319 (2.7)	351 (2.4)	413 (2.3)	489 (2.2)	562 (2.4)	624 (2.8)	659 (3.7)
United States	334 (5.9)	366 (5.9)	420 (5.1)	487 (4.5)	554 (5.4)	612 (5.2)	644 (4.6)
Uzbekistan	284 (5.3)	313 (4.6)	360 (3.7)	416 (4.2)	478 (6.3)	537 (7.9)	575 (12.0)
Benchmarking Participants							
Abu Dhabi, UAE	294 (3.7)	323 (4.3)	379 (3.5)	453 (4.1)	525 (3.3)	585 (3.5)	620 (4.4)
Dubai, UAE	370 (6.8)	412 (6.2)	485 (4.3)	552 (3.3)	614 (2.8)	667 (3.1)	697 (4.9)
Sharjah, UAE	346 (4.4)	375 (4.8)	430 (4.9)	497 (4.7)	560 (7.1)	615 (8.5)	645 (11.6)

Percentiles are defined in terms of percentages of students at or below a point on the scale.
() Standard errors appear in parentheses. Because of rounding some results may appear inconsistent.

SOURCE: IEA's Trends in International Mathematics and Science Study - TIMSS 2023
Downloaded from <https://timss2023.org/results>

Exhibit D.4: Percentiles of Science Achievement

Country	5 th Percentile	10 th Percentile	25 th Percentile	50 th Percentile	75 th Percentile	90 th Percentile	95 th Percentile
Australia	354 (7.3)	393 (7.0)	458 (5.3)	526 (3.2)	587 (2.7)	636 (3.9)	666 (3.3)
Austria	365 (6.3)	399 (5.5)	457 (3.5)	516 (3.3)	571 (3.5)	618 (2.8)	643 (3.0)
Azerbaijan	280 (4.8)	308 (4.2)	356 (4.1)	411 (3.8)	466 (3.7)	514 (3.2)	544 (5.0)
Bahrain	280 (4.4)	313 (4.8)	376 (4.4)	452 (4.0)	526 (3.6)	588 (4.3)	624 (4.8)
Brazil	279 (2.9)	308 (2.8)	358 (2.7)	417 (3.0)	480 (3.2)	536 (4.9)	569 (8.4)
Chile	321 (5.4)	348 (4.9)	399 (3.7)	455 (3.0)	512 (3.2)	560 (3.1)	590 (4.3)
Chinese Taipei	410 (5.9)	448 (4.9)	513 (3.3)	579 (3.0)	636 (3.1)	681 (2.6)	709 (4.0)
Cote d'Ivoire	5 (0.0)	22 (5.0)	89 (5.2)	170 (6.4)	260 (10.5)	354 (20.4)	412 (27.8)
Cyprus	311 (6.1)	343 (3.9)	400 (3.0)	465 (3.6)	529 (4.7)	584 (6.4)	612 (6.5)
Czech Republic	399 (4.9)	427 (3.6)	475 (3.0)	529 (2.1)	580 (2.0)	625 (2.2)	652 (2.7)
England	358 (7.2)	398 (7.0)	467 (5.7)	537 (5.3)	600 (5.6)	653 (5.7)	684 (5.8)
Finland	367 (6.7)	407 (5.1)	470 (3.7)	535 (4.0)	596 (3.0)	648 (3.4)	679 (5.1)
France	350 (6.8)	380 (5.9)	431 (4.5)	489 (3.7)	543 (3.8)	588 (3.3)	615 (5.2)
Georgia	318 (6.6)	347 (5.9)	394 (3.5)	447 (3.3)	502 (3.2)	552 (4.0)	578 (3.4)
Hong Kong SAR	359 (8.1)	400 (7.8)	469 (7.0)	536 (5.2)	593 (5.4)	641 (6.3)	670 (8.5)
Hungary	374 (9.0)	410 (6.7)	466 (4.3)	527 (3.6)	581 (3.5)	626 (3.5)	652 (4.2)
Iran, Islamic Rep. of	261 (7.2)	296 (5.7)	356 (4.1)	421 (4.0)	485 (4.0)	539 (4.1)	569 (5.5)
Ireland	374 (7.0)	407 (8.7)	467 (4.9)	529 (4.0)	587 (3.5)	636 (3.6)	662 (4.8)
Israel	313 (6.4)	347 (5.5)	409 (4.1)	485 (4.0)	551 (4.9)	607 (5.8)	640 (8.5)
Italy	362 (5.5)	393 (5.4)	444 (4.5)	503 (4.2)	559 (2.9)	605 (3.0)	632 (3.9)
Japan	419 (6.5)	453 (5.0)	506 (3.2)	562 (3.5)	612 (3.8)	654 (3.7)	678 (4.7)
Jordan	251 (5.9)	285 (5.3)	345 (4.6)	412 (4.7)	481 (4.9)	541 (4.5)	574 (4.5)
Kazakhstan	312 (4.7)	338 (2.8)	384 (3.5)	440 (3.4)	498 (3.6)	551 (5.8)	583 (6.4)
Korea, Rep. of	394 (5.2)	431 (4.0)	491 (2.9)	550 (3.0)	604 (2.4)	651 (3.0)	681 (4.6)
Kuwait	248 (8.6)	285 (7.4)	349 (7.2)	422 (5.9)	491 (5.3)	550 (7.7)	585 (12.6)
Lithuania	374 (6.5)	406 (4.3)	461 (3.2)	522 (2.9)	578 (3.3)	626 (4.0)	657 (5.9)
Malaysia	272 (5.5)	304 (4.7)	361 (5.4)	427 (4.3)	491 (4.7)	548 (4.1)	580 (4.7)
Malta	322 (3.2)	359 (3.9)	429 (3.3)	508 (1.7)	576 (2.1)	632 (2.7)	663 (5.2)
Morocco	205 (4.2)	228 (4.3)	270 (4.0)	321 (3.7)	379 (3.7)	435 (4.8)	470 (5.5)
New Zealand	337 (5.0)	372 (4.9)	435 (5.6)	507 (5.9)	572 (5.2)	623 (5.6)	652 (6.6)
Norway (9)	331 (5.3)	366 (3.9)	426 (4.2)	492 (3.1)	554 (3.4)	603 (3.2)	631 (4.7)
Oman	293 (5.1)	324 (3.9)	386 (3.5)	458 (3.1)	526 (2.4)	582 (2.2)	614 (4.2)
Palestinian Nat'l Auth.	237 (3.9)	267 (4.0)	323 (3.7)	392 (3.5)	462 (3.2)	520 (4.1)	552 (3.7)
Portugal	372 (3.5)	399 (3.4)	448 (3.4)	505 (2.9)	564 (3.2)	613 (3.1)	640 (4.2)
Qatar	315 (6.1)	346 (5.9)	406 (6.5)	483 (5.8)	556 (5.2)	615 (7.6)	649 (6.7)
Romania	318 (8.7)	352 (7.3)	411 (5.7)	470 (3.7)	524 (4.1)	570 (3.9)	600 (6.0)
Saudi Arabia	266 (4.4)	296 (4.2)	352 (4.2)	418 (4.2)	485 (4.0)	544 (3.4)	577 (4.2)
Singapore	422 (11.6)	467 (11.6)	547 (8.8)	617 (5.2)	676 (3.8)	722 (5.2)	749 (5.5)
South Africa (9)	201 (5.4)	234 (5.0)	292 (4.2)	356 (3.9)	426 (5.3)	499 (7.2)	549 (9.2)
Sweden	352 (5.7)	390 (5.7)	455 (4.5)	526 (3.9)	591 (2.9)	644 (3.7)	676 (5.6)
Türkiye	367 (6.1)	401 (5.6)	460 (4.8)	532 (4.2)	600 (3.8)	654 (4.0)	683 (4.0)
United Arab Emirates	285 (3.4)	326 (2.9)	403 (2.7)	493 (2.4)	572 (2.5)	635 (2.7)	669 (3.9)
United States	349 (6.6)	385 (6.1)	449 (5.0)	517 (4.5)	581 (4.5)	634 (3.6)	664 (4.7)
Uzbekistan	277 (5.2)	303 (4.1)	345 (4.4)	394 (4.1)	444 (4.0)	492 (5.9)	521 (7.5)
Benchmarking Participants							
Abu Dhabi, UAE	248 (3.7)	280 (4.4)	347 (4.6)	445 (5.3)	539 (3.9)	604 (3.8)	638 (3.5)
Dubai, UAE	359 (7.5)	406 (6.3)	483 (5.1)	556 (3.3)	620 (3.1)	672 (4.9)	703 (5.8)
Sharjah, UAE	329 (4.3)	364 (4.2)	428 (4.6)	502 (5.0)	569 (6.6)	630 (10.6)	664 (12.1)

Percentiles are defined in terms of percentages of students at or below a point on the scale.

() Standard errors appear in parentheses. Because of rounding some results may appear inconsistent.

SOURCE: IEA's Trends in International Mathematics and Science Study - TIMSS 2023
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BOSTON COLLEGE

APPENDIX E: Percentages of Students with Achievement to Low for Estimation

Exhibit E.1: Percentages of Students with Mathematics Achievement Too Low for Estimation

Country	Percentage of Students with Achievement Too Low for Estimation*	Percentage of Students with Zero Score Points**	Average Percent Correct Across Items	Average Percent Missing Across Items
Albania	2 (0.6)	1 (0.2)	52 (1.1)	9 (0.7)
Armenia	2 (0.3)	1 (0.1)	55 (0.7)	18 (0.5)
Australia	2 (0.2)	0 (0.1)	55 (0.6)	4 (0.2)
Azerbaijan	5 (0.6)	1 (0.2)	49 (0.7)	12 (0.5)
Bahrain	5 (0.4)	1 (0.2)	42 (0.8)	8 (0.3)
Belgium (Flemish)	1 (0.2)	0 (0.1)	53 (0.6)	4 (0.2)
Belgium (French)	2 (0.2)	0 (0.1)	47 (0.5)	7 (0.3)
Bosnia & Herzegovina	7 (0.6)	2 (0.3)	38 (0.7)	14 (0.5)
ψ Brazil	16 (0.8)	5 (0.4)	30 (0.7)	15 (0.4)
Bulgaria	4 (0.7)	0 (0.1)	55 (0.8)	8 (0.8)
Canada	2 (0.2)	0 (0.1)	50 (0.4)	6 (0.2)
Chile	7 (0.5)	1 (0.2)	37 (0.5)	10 (0.4)
Chinese Taipei	0 (0.0)	0 (0.0)	71 (0.4)	1 (0.1)
Cyprus	4 (0.4)	1 (0.1)	51 (0.5)	10 (0.5)
Czech Republic	1 (0.2)	0 (0.1)	56 (0.5)	6 (0.2)
Denmark	1 (0.2)	0 (0.1)	55 (0.5)	8 (0.4)
England	1 (0.2)	0 (0.1)	61 (0.6)	4 (0.2)
Finland	1 (0.2)	0 (0.1)	56 (0.6)	5 (0.3)
France	3 (0.3)	1 (0.2)	46 (0.7)	12 (0.4)
Georgia	3 (0.3)	1 (0.2)	50 (0.8)	12 (0.4)
Germany	2 (0.3)	0 (0.1)	55 (0.5)	7 (0.2)
Hong Kong SAR	1 (0.1)	0 (0.1)	71 (0.9)	2 (0.2)
Hungary	2 (0.3)	0 (0.1)	54 (0.7)	3 (0.2)
ψ Iran, Islamic Rep. of	21 (1.1)	4 (0.4)	33 (0.6)	22 (0.8)
Ireland	1 (0.2)	0 (0.1)	59 (0.7)	3 (0.1)
Italy	2 (0.2)	0 (0.1)	52 (0.6)	8 (0.3)
Japan	0 (0.1)	0 (0.0)	68 (0.5)	4 (0.2)
Jordan	10 (0.8)	1 (0.2)	37 (1.1)	7 (0.3)
Kazakhstan	3 (0.3)	1 (0.1)	46 (0.7)	5 (0.2)
Korea, Rep. of	0 (0.1)	0 (0.0)	69 (0.6)	2 (0.2)
Kosovo	4 (0.5)	1 (0.2)	41 (0.6)	8 (0.5)
Kuwait	9 (0.7)	1 (0.2)	43 (0.7)	11 (0.5)
Latvia	1 (0.1)	0 (0.1)	57 (0.6)	4 (0.2)
Lithuania	0 (0.1)	0 (0.0)	63 (0.6)	2 (0.1)
Macao SAR	0 (0.1)	0 (0.0)	67 (0.3)	2 (0.1)
Montenegro	3 (0.3)	1 (0.2)	44 (0.4)	13 (0.3)
Morocco	6 (0.5)	0 (0.1)	44 (0.9)	8 (0.5)
Netherlands	1 (0.2)	0 (0.1)	58 (0.5)	5 (0.3)
New Zealand	3 (0.3)	1 (0.2)	47 (0.5)	6 (0.2)
North Macedonia	5 (0.5)	1 (0.2)	44 (0.7)	13 (0.4)
Norway (5)	1 (0.2)	0 (0.1)	57 (0.5)	7 (0.3)
Oman	10 (0.6)	1 (0.2)	37 (0.8)	9 (0.3)
Poland	1 (0.1)	0 (0.0)	60 (0.5)	4 (0.2)
Portugal	1 (0.2)	0 (0.1)	53 (0.6)	6 (0.2)
Qatar	5 (0.5)	1 (0.2)	41 (0.7)	6 (0.3)
Romania	2 (0.4)	0 (0.1)	59 (1.1)	5 (0.4)
Saudi Arabia	9 (0.6)	1 (0.2)	36 (0.8)	6 (0.3)
Serbia	1 (0.3)	0 (0.1)	55 (0.8)	6 (0.3)
Singapore	0 (0.1)	0 (0.0)	72 (0.6)	1 (0.1)
Slovak Republic	2 (0.3)	0 (0.1)	53 (0.7)	5 (0.3)
Slovenia	2 (0.2)	0 (0.1)	52 (0.4)	6 (0.2)
South Africa (5)	10 (0.5)	1 (0.1)	36 (0.6)	4 (0.2)
Spain	2 (0.2)	0 (0.1)	49 (0.4)	8 (0.2)
Sweden	1 (0.2)	1 (0.1)	57 (0.6)	7 (0.3)
Türkiye (5)	1 (0.2)	0 (0.1)	61 (0.9)	2 (0.1)
United Arab Emirates	4 (0.1)	1 (0.0)	50 (0.2)	5 (0.1)
United States	2 (0.2)	0 (0.1)	53 (0.7)	5 (0.2)
Uzbekistan	5 (0.5)	1 (0.2)	36 (0.6)	7 (0.3)
Benchmarking Participants				
Ontario, Canada	2 (0.3)	0 (0.1)	49 (0.8)	6 (0.4)
Quebec, Canada	1 (0.2)	0 (0.1)	53 (0.7)	5 (0.3)
Abu Dhabi, UAE	6 (0.3)	1 (0.1)	44 (0.4)	5 (0.1)
Dubai, UAE	1 (0.1)	0 (0.0)	62 (0.3)	4 (0.1)
Sharjah, UAE	3 (0.3)	1 (0.1)	50 (0.8)	6 (0.2)

* Students were considered to have achievement too low for estimation if their performance on the assessment was no better than could be achieved by simply guessing on the multiple-choice assessment items. However, such students were assigned scale scores (plausible values) by the achievement scaling procedure, despite concerns about their reliability.

** Students who received zero score points did not answer any assessment items correctly and have achievement too low for estimation.

ψ Reservations about reliability because the percentage of students with achievement too low for estimation exceeds 15% but does not exceed 25%.

() Standard errors appear in parentheses. Because of rounding some results may appear inconsistent.

Exhibit E.2: Percentages of Students with Science Achievement Too Low for Estimation

Country	Percentage of Students with Achievement Too Low for Estimation*	Percentage of Students with Zero Score Points**	Average Percent Correct Across Items	Average Percent Missing Across Items
Albania	2 (0.4)	0 (0.1)	50 (0.9)	8 (0.8)
Armenia	4 (0.4)	0 (0.1)	49 (0.5)	24 (0.5)
Australia	1 (0.2)	0 (0.0)	60 (0.5)	2 (0.2)
Azerbaijan	6 (0.5)	1 (0.2)	39 (0.4)	13 (0.5)
Bahrain	5 (0.4)	0 (0.1)	48 (0.7)	6 (0.3)
Belgium (Flemish)	1 (0.2)	0 (0.1)	48 (0.5)	3 (0.2)
Belgium (French)	2 (0.3)	0 (0.1)	49 (0.4)	7 (0.3)
Bosnia & Herzegovina	4 (0.5)	0 (0.2)	43 (0.5)	12 (0.4)
Brazil	9 (0.4)	2 (0.1)	40 (0.6)	14 (0.4)
Bulgaria	2 (0.5)	0 (0.1)	60 (0.8)	7 (0.6)
Canada	1 (0.1)	0 (0.0)	55 (0.4)	4 (0.2)
Chile	3 (0.3)	0 (0.1)	48 (0.4)	7 (0.3)
Chinese Taipei	0 (0.1)	0 (0.0)	63 (0.4)	2 (0.1)
Cyprus	4 (0.4)	0 (0.1)	52 (0.5)	11 (0.5)
Czech Republic	1 (0.1)	0 (0.0)	57 (0.4)	4 (0.1)
Denmark	1 (0.2)	0 (0.1)	56 (0.5)	4 (0.3)
England	1 (0.1)	0 (0.0)	62 (0.5)	2 (0.2)
Finland	1 (0.2)	0 (0.1)	60 (0.5)	3 (0.2)
France	2 (0.3)	0 (0.0)	51 (0.5)	8 (0.3)
Georgia	3 (0.4)	0 (0.1)	47 (0.6)	11 (0.4)
Germany	2 (0.3)	0 (0.1)	55 (0.4)	6 (0.2)
Hong Kong SAR	1 (0.2)	0 (0.0)	60 (0.7)	3 (0.2)
Hungary	2 (0.4)	0 (0.1)	55 (0.6)	3 (0.2)
Iran, Islamic Rep. of	12 (0.8)	2 (0.2)	45 (0.6)	17 (0.7)
Ireland	1 (0.3)	0 (0.1)	57 (0.6)	2 (0.2)
Italy	1 (0.2)	0 (0.0)	55 (0.4)	7 (0.3)
Japan	0 (0.1)	0 (0.1)	60 (0.5)	4 (0.3)
Jordan	8 (0.6)	0 (0.1)	41 (0.9)	7 (0.3)
Kazakhstan	3 (0.3)	0 (0.1)	45 (0.6)	5 (0.2)
Korea, Rep. of	0 (0.2)	0 (0.0)	64 (0.5)	2 (0.2)
Kosovo	6 (0.6)	1 (0.1)	37 (0.5)	8 (0.4)
ψ Kuwait	18 (1.0)	2 (0.3)	36 (0.7)	16 (0.7)
Latvia	1 (0.2)	0 (0.1)	56 (0.5)	3 (0.2)
Lithuania	0 (0.1)	0 (0.0)	58 (0.5)	2 (0.1)
Macao SAR	1 (0.1)	0 (0.0)	59 (0.3)	3 (0.1)
Montenegro	4 (0.3)	0 (0.1)	46 (0.3)	12 (0.3)
Morocco	14 (0.8)	1 (0.2)	37 (0.7)	13 (0.6)
Netherlands	1 (0.3)	0 (0.0)	54 (0.4)	3 (0.2)
New Zealand	2 (0.2)	0 (0.1)	54 (0.4)	3 (0.2)
North Macedonia	6 (0.5)	1 (0.2)	43 (0.6)	14 (0.4)
Norway (5)	1 (0.1)	0 (0.1)	57 (0.4)	3 (0.2)
Oman	7 (0.5)	1 (0.1)	43 (0.7)	7 (0.3)
Poland	0 (0.1)	0 (0.0)	61 (0.4)	3 (0.1)
Portugal	2 (0.2)	0 (0.1)	54 (0.5)	5 (0.2)
Qatar	5 (0.4)	1 (0.1)	47 (0.6)	5 (0.3)
Romania	2 (0.4)	0 (0.0)	57 (0.9)	4 (0.4)
Saudi Arabia	6 (0.4)	0 (0.1)	42 (0.7)	4 (0.2)
Serbia	1 (0.3)	0 (0.1)	54 (0.6)	5 (0.3)
Singapore	0 (0.1)	0 (0.0)	69 (0.5)	0 (0.0)
Slovak Republic	2 (0.3)	0 (0.1)	55 (0.6)	3 (0.2)
Slovenia	1 (0.1)	0 (0.0)	56 (0.4)	4 (0.2)
✱ South Africa (5)	27 (0.9)	2 (0.2)	28 (0.6)	7 (0.4)
Spain	1 (0.1)	0 (0.0)	53 (0.4)	6 (0.2)
Sweden	1 (0.2)	0 (0.1)	58 (0.6)	4 (0.2)
Türkiye (5)	1 (0.1)	0 (0.0)	65 (0.7)	1 (0.1)
United Arab Emirates	5 (0.2)	0 (0.0)	52 (0.2)	4 (0.1)
United States	2 (0.2)	0 (0.1)	58 (0.5)	4 (0.2)
Uzbekistan	6 (0.5)	1 (0.2)	36 (0.5)	8 (0.4)
Benchmarking Participants				
Ontario, Canada	1 (0.2)	0 (0.1)	56 (0.6)	4 (0.3)
Quebec, Canada	1 (0.2)	0 (0.1)	52 (0.5)	4 (0.2)
Abu Dhabi, UAE	8 (0.4)	1 (0.1)	46 (0.3)	4 (0.2)
Dubai, UAE	1 (0.1)	0 (0.0)	63 (0.3)	2 (0.1)
Sharjah, UAE	3 (0.4)	0 (0.1)	53 (0.7)	5 (0.3)

* Students were considered to have achievement too low for estimation if their performance on the assessment was no better than could be achieved by simply guessing on the multiple-choice assessment items. However, such students were assigned scale scores (plausible values) by the achievement scaling procedure, despite concerns about their reliability.

** Students who received zero score points did not answer any assessment items correctly and have achievement too low for estimation.

ψ Reservations about reliability because the percentage of students with achievement too low for estimation exceeds 15% but does not exceed 25%.

✱ Average achievement not reliably measured because the percentage of students with achievement too low for estimation exceeds 25%.

() Standard errors appear in parentheses. Because of rounding some results may appear inconsistent.

Exhibit E.3: Percentages of Students with Mathematics Achievement Too Low for Estimation

Country	Percentage of Students with Achievement Too Low for Estimation*	Percentage of Students with Zero Score Points**	Average Percent Correct Across Items	Average Percent Missing Across Items
Australia	4 (0.4)	1 (0.2)	47 (0.8)	5 (0.2)
Austria	1 (0.3)	0 (0.1)	47 (0.6)	6 (0.3)
Azerbaijan	6 (0.5)	2 (0.2)	42 (0.8)	14 (0.5)
Bahrain	10 (0.5)	3 (0.3)	29 (0.4)	5 (0.2)
Ψ Brazil	18 (0.5)	5 (0.2)	21 (0.5)	10 (0.3)
Chile	11 (0.6)	3 (0.4)	28 (0.5)	13 (0.5)
Chinese Taipei	1 (0.2)	0 (0.1)	66 (0.7)	1 (0.1)
✱ Côte d'Ivoire	63 (1.5)	13 (0.7)	12 (0.6)	33 (0.9)
Cyprus	5 (0.3)	1 (0.2)	44 (0.7)	7 (0.3)
Czech Republic	2 (0.2)	0 (0.1)	49 (0.5)	7 (0.2)
England	3 (0.4)	1 (0.2)	51 (1.1)	7 (0.4)
Finland	4 (0.4)	1 (0.2)	45 (0.6)	6 (0.3)
France	4 (0.4)	1 (0.1)	40 (0.7)	9 (0.4)
Georgia	6 (0.5)	2 (0.2)	38 (0.7)	12 (0.5)
Hong Kong SAR	2 (0.4)	1 (0.2)	63 (1.1)	3 (0.3)
Hungary	3 (0.4)	1 (0.1)	46 (0.8)	4 (0.2)
Ψ Iran, Islamic Rep. of	16 (0.8)	1 (0.2)	29 (0.6)	18 (0.5)
Ireland	2 (0.3)	1 (0.1)	50 (0.7)	5 (0.2)
Israel	5 (0.4)	1 (0.2)	43 (0.9)	9 (0.3)
Italy	3 (0.4)	1 (0.2)	45 (0.7)	8 (0.3)
Japan	1 (0.1)	0 (0.1)	66 (0.7)	4 (0.2)
Jordan	13 (0.7)	3 (0.3)	24 (0.5)	4 (0.2)
Kazakhstan	6 (0.4)	2 (0.2)	34 (0.7)	8 (0.3)
Korea, Rep. of	1 (0.2)	0 (0.1)	65 (0.7)	3 (0.2)
Ψ Kuwait	20 (0.9)	1 (0.2)	24 (1.0)	11 (0.6)
Lithuania	3 (0.3)	1 (0.1)	48 (0.7)	6 (0.2)
Malaysia	12 (0.6)	3 (0.2)	24 (0.6)	2 (0.1)
Malta	4 (0.3)	1 (0.2)	44 (0.4)	5 (0.2)
Morocco	14 (0.7)	3 (0.3)	22 (0.5)	10 (0.4)
New Zealand	5 (0.4)	2 (0.3)	41 (1.0)	5 (0.3)
Norway (9)	4 (0.3)	1 (0.1)	46 (0.5)	11 (0.3)
Oman	10 (0.4)	2 (0.2)	28 (0.5)	4 (0.2)
Ψ Palestinian Nat'l Auth.	17 (0.6)	5 (0.3)	23 (0.5)	4 (0.2)
Portugal	4 (0.4)	1 (0.1)	39 (0.6)	7 (0.3)
Qatar	9 (0.7)	3 (0.4)	34 (0.9)	5 (0.3)
Romania	5 (0.7)	1 (0.3)	44 (1.1)	7 (0.5)
Saudi Arabia	13 (0.6)	3 (0.2)	24 (0.6)	3 (0.1)
Singapore	1 (0.3)	0 (0.2)	67 (1.5)	1 (0.1)
Ψ South Africa (9)	20 (0.8)	1 (0.1)	20 (0.6)	5 (0.2)
Sweden	3 (0.3)	1 (0.2)	49 (0.6)	9 (0.3)
Türkiye	5 (0.4)	1 (0.2)	47 (1.0)	6 (0.3)
United Arab Emirates	5 (0.2)	1 (0.1)	43 (0.4)	5 (0.1)
United States	5 (0.4)	1 (0.1)	42 (1.0)	4 (0.3)
Uzbekistan	10 (0.7)	3 (0.3)	27 (0.9)	8 (0.4)
Benchmarking Participants				
Abu Dhabi, UAE	6 (0.4)	1 (0.1)	37 (0.6)	4 (0.1)
Dubai, UAE	2 (0.3)	1 (0.1)	56 (0.7)	5 (0.3)
Sharjah, UAE	4 (0.4)	1 (0.1)	43 (1.3)	5 (0.2)

* Students were considered to have achievement too low for estimation if their performance on the assessment was no better than could be achieved by simply guessing on the multiple-choice assessment items. However, such students were assigned scale scores (plausible values) by the achievement scaling procedure, despite concerns about their reliability.

** Students who received zero score points did not answer any assessment items correctly and have achievement too low for estimation.

Ψ Reservations about reliability because the percentage of students with achievement too low for estimation exceeds 15% but does not exceed 25%.

✱ Average achievement not reliably measured because the percentage of students with achievement too low for estimation exceeds 25%.

() Standard errors appear in parentheses. Because of rounding some results may appear inconsistent.

SOURCE: IEA's Trends in International Mathematics and Science Study - TIMSS 2023
Downloaded from <https://timss2023.org/results>

Exhibit E.4: Percentages of Students with Science Achievement Too Low for Estimation

Country	Percentage of Students with Achievement Too Low for Estimation*	Percentage of Students with Zero Score Points**	Average Percent Correct Across Items	Average Percent Missing Across Items
Australia	2 (0.3)	0 (0.1)	52 (0.6)	3 (0.2)
Austria	1 (0.2)	0 (0.0)	51 (0.4)	3 (0.1)
Azerbaijan	8 (0.7)	0 (0.1)	35 (0.5)	14 (0.6)
Bahrain	5 (0.4)	0 (0.0)	40 (0.4)	4 (0.1)
Brazil	6 (0.3)	0 (0.1)	35 (0.4)	8 (0.2)
Chile	3 (0.4)	0 (0.1)	41 (0.5)	8 (0.4)
Chinese Taipei	1 (0.1)	0 (0.0)	60 (0.5)	1 (0.1)
✱ Cote d'Ivoire	60 (1.9)	13 (0.8)	17 (0.7)	41 (1.1)
Cyprus	3 (0.3)	0 (0.0)	42 (0.6)	6 (0.2)
Czech Republic	0 (0.1)	0 (0.0)	54 (0.4)	3 (0.1)
England	2 (0.3)	0 (0.1)	55 (0.8)	4 (0.3)
Finland	2 (0.3)	0 (0.1)	54 (0.5)	3 (0.2)
France	2 (0.3)	0 (0.1)	46 (0.6)	5 (0.2)
Georgia	3 (0.3)	0 (0.1)	40 (0.5)	9 (0.4)
Hong Kong SAR	2 (0.3)	0 (0.1)	54 (0.9)	4 (0.3)
Hungary	1 (0.2)	0 (0.0)	53 (0.6)	3 (0.2)
Iran, Islamic Rep. of	8 (0.7)	0 (0.1)	35 (0.5)	11 (0.4)
Ireland	1 (0.3)	0 (0.0)	53 (0.7)	2 (0.1)
Israel	3 (0.3)	0 (0.1)	45 (0.7)	5 (0.2)
Italy	1 (0.2)	0 (0.0)	49 (0.6)	5 (0.2)
Japan	1 (0.1)	0 (0.0)	57 (0.6)	3 (0.1)
Jordan	7 (0.5)	0 (0.1)	35 (0.5)	4 (0.2)
Kazakhstan	4 (0.3)	0 (0.0)	38 (0.5)	7 (0.2)
Korea, Rep. of	1 (0.2)	0 (0.0)	55 (0.4)	3 (0.1)
Kuwait	8 (0.8)	0 (0.1)	34 (0.9)	8 (0.4)
Lithuania	1 (0.2)	0 (0.0)	52 (0.5)	3 (0.1)
Malaysia	5 (0.4)	0 (0.1)	34 (0.6)	2 (0.1)
Malta	3 (0.3)	0 (0.1)	49 (0.3)	3 (0.1)
ψ Morocco	17 (0.7)	1 (0.1)	24 (0.4)	10 (0.3)
New Zealand	2 (0.3)	0 (0.0)	49 (0.8)	3 (0.2)
Norway (9)	3 (0.3)	0 (0.1)	47 (0.5)	6 (0.2)
Oman	4 (0.3)	0 (0.0)	43 (0.4)	3 (0.1)
Palestinian Nat'l Auth.	9 (0.5)	0 (0.1)	32 (0.4)	4 (0.2)
Portugal	1 (0.1)	0 (0.0)	50 (0.4)	4 (0.2)
Qatar	3 (0.3)	0 (0.1)	45 (0.8)	3 (0.2)
Romania	4 (0.6)	0 (0.2)	43 (0.7)	6 (0.5)
Saudi Arabia	6 (0.5)	0 (0.1)	36 (0.5)	3 (0.1)
Singapore	1 (0.2)	0 (0.0)	65 (1.1)	1 (0.1)
ψ South Africa (9)	18 (0.7)	0 (0.1)	25 (0.5)	6 (0.2)
Sweden	2 (0.2)	0 (0.1)	53 (0.6)	5 (0.2)
Türkiye	1 (0.3)	0 (0.0)	55 (0.7)	4 (0.2)
United Arab Emirates	4 (0.2)	0 (0.0)	48 (0.4)	4 (0.1)
United States	2 (0.2)	0 (0.0)	51 (0.7)	3 (0.3)
Uzbekistan	7 (0.5)	0 (0.1)	30 (0.5)	9 (0.3)
Benchmarking Participants				
Abu Dhabi, UAE	8 (0.4)	0 (0.1)	42 (0.6)	3 (0.1)
Dubai, UAE	1 (0.2)	0 (0.0)	58 (0.6)	3 (0.3)
Sharjah, UAE	2 (0.2)	0 (0.0)	49 (0.9)	4 (0.2)

* Students were considered to have achievement too low for estimation if their performance on the assessment was no better than could be achieved by simply guessing on the multiple-choice assessment items. However, such students were assigned scale scores (plausible values) by the achievement scaling procedure, despite concerns about their reliability.

** Students who received zero score points did not answer any assessment items correctly and have achievement too low for estimation.

ψ Reservations about reliability because the percentage of students with achievement too low for estimation exceeds 15% but does not exceed 25%.

✱ Average achievement not reliably measured because the percentage of students with achievement too low for estimation exceeds 25%.

() Standard errors appear in parentheses. Because of rounding some results may appear inconsistent.

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APPENDIX F: Organizations and Individuals Responsible for TIMSS 2023

Introduction

TIMSS 2023 was a collaborative effort involving hundreds of individuals around the world. This appendix acknowledges the individuals and organizations for their contributions. Given that the work on TIMSS 2023 spanned more than four years and involved so many people and organizations, this list may not include all who contributed. Any omission is inadvertent. TIMSS 2023 also acknowledges the students, parents, teachers, and school principals who contributed their time and effort to the study. This report would not be possible without them.

Management and Coordination

TIMSS is a major undertaking of IEA, and together with the Progress in International Reading Literacy Study (PIRLS), comprises the core of IEA's regular cycles of studies. The TIMSS assessment at the fourth grade complements PIRLS, which regularly assesses reading achievement at fourth grade.

TIMSS 2023 was conducted by IEA's TIMSS & PIRLS International Study Center at Boston College, which has responsibility for the overall direction and management of TIMSS and PIRLS, including design, development, and implementation. Headed by Executive Directors Drs. Matthias von Davier, Ina V.S. Mullis (through 2023), and Michael O. Martin (through 2022), the study center is located in the Lynch School of Education and Human Development. The TIMSS & PIRLS International Study Center worked closely with IEA Amsterdam, which was responsible for managing country participation, overseeing the verification process of all translations produced by the participating countries, and coordinating the school visits by International Quality Control Monitors. Staff at IEA Hamburg worked closely with participating countries to organize sampling and data collection operations and to check all data for accuracy and consistency within and across countries. RTI International in North Carolina, USA was responsible for school and student sampling activities.

The Project Management Team, comprising the study directors and representatives from the TIMSS & PIRLS International Study Center, IEA Amsterdam, IEA Hamburg, and RTI International met twice a year throughout the study to discuss the study's progress, procedures, and schedule. In addition, the study directors met with members of IEA's Technical Executive Group twice each year to review technical issues.

To work with the international team and coordinate within-country activities, each participating country designates an individual to be the TIMSS National Research Coordinator (NRC). The NRCs have the challenging task of implementing TIMSS in their countries in accordance with the TIMSS guidelines and procedures. In addition, the NRCs contribute to the development of the TIMSS assessments and provide input throughout the course of the project. The quality of the TIMSS assessment and data depends on the work of the NRCs and their colleagues in carrying out the complex sampling, data collection, and scoring tasks. Continuing the tradition of exemplary work established in previous cycles of TIMSS, the TIMSS 2023 NRCs performed their many tasks with dedication, competence, energy, and goodwill, and demonstrated a commitment to the project and high-quality work.

Funding

Funding for TIMSS 2023 was provided primarily by the participating countries. Boston College also is gratefully acknowledged for its generous financial support and stimulating educational environment.

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Eugenio Gonzalez, *Senior Research Director, Statistics, Psychometrics, and Assessment Innovations*

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Ann Kennedy, *Senior Research Director, Project Management*

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