



Bangladesh Mathematics and Science Olympiad

BdMSO Syllabus

May 10, 2026

Organizer

Society for the Popularization of Science, Bangladesh (SPSB)
Bangladesh Open Source Network (BdOSN)

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1. Arithmetic and Number Theory

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| A. Whole and Rational Numbers | Absolute Value, understanding fractions, decimals and percentages, and converting between them, number base systems. |
| B. Properties of Numbers | Even and odd integers, prime and composite numbers, and prime factorization. |
| C. Factors and Multiples | Greatest Common Divisor (GCD) and Least Common Multiple (LCM). |
| D. Divisibility and Sequences | Divisibility rules, remainders and basic modular arithmetic, cyclic patterns, ordering of numbers, and evaluating complex arithmetic & geometric sequences. |
| E. Ratio and Proportion | Solving real-world problems using ratios, rates and direct/inverse proportions. |

2. Geometry and Spatial Sense

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| A. Polygons and Circles | Angle relationships, properties of triangles, quadrilaterals, parallelograms, trapeziums, and circles. |
| B. Measurements | Calculating angles, area, and perimeter of various 2D shapes. |
| C. Coordinate and Transformational Geometry | Basics of the Cartesian plane, plotting points, grid distances, and spatial transformations: symmetry, reflection, rotation, similarity, and proportion. |
| D. 3D Geometry | Properties of solid figures, cubes, parallelepipeds, calculating surface area and volume. |
| E. Spatial Visualization | Understanding and solving problems involving the nets of 3D shapes. |

3. Algebra and Pattern Recognition

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| A. Pattern Recognition | Identifying and predicting terms in complex numeric and geometric sequences. |
| B. Basic Algebra | Evaluating algebraic expressions, variables as unknowns, and solving simple linear equations and inequalities. |
| C. Advanced Expressions | Introduction to quadratic expressions and basic factorization. |

4. Data Analysis, Statistics, and Measurement

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| A. Data Representation | Reading and interpreting tables, bar charts, pie charts, line graphs, and scatter plots. |
| B. Statistical Averages | Mean, median, and mode. |
| C. Advanced Averages | Understanding how changing individual values in a dataset affects the overall average and range. |

5. Combinatorics and Probability

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| A. Counting Techniques | Systematic counting, finding the number of possible ordered pairs, and basic permutations and combinations, the Pigeonhole Principle, and the Inclusion-Exclusion principle. |
| B. Probability | Calculating the likelihood of specific outcomes in random events, understanding independent and dependent events. |

6. Recreational Mathematics

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| A. Mathematical Puzzles | Logic grids, parity, magic squares, cryptarithms, working backward, and critical thinking brainteasers. |
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1. Scientific Method and Experimental Reasoning

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| A. Scientific Thinking | Observation, forming hypotheses, and drawing conclusions based on evidence. |
| B. Measurements | Units of length, mass, time, temperature and volume.
Calculating area and volume from length; Scientific notation.
Using scientific instruments: accuracy, precision, and estimation. |
| C. Experimental Design and Data Interpretation | Organizing data in tables, interpreting experimental diagrams.
Analyzing graph, Extrapolation and Interpolation. |

2. Life Science

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| A. The Basics of Life | Characteristics of living vs. non-living things, the cell as the basic unit of life, movement of materials in and out of cells. |
| B. Plant Science | Photosynthesis, respiration, transpiration, seed germination, pollination, tissue systems, and basic hormone regulation. |
| C. Human Anatomy and Organ Systems | Skeleton and muscles; Olfactory, auditory and visual system.
Brain, spinal cord, nerves, and reflex actions.
Eyes, Ears, Nose; Skin and temperature.
Nutrient absorption, digestive system, renal system, kidneys, waste removal, and the endocrine system. |
| D. Health and Metabolism | General health, nutrition, release of energy from food.
Common diseases and their prevention, and hygiene. |
| E. Microbiology and Genetics | Beneficial vs. harmful bacteria, viruses, microbes, antibiotic resistance, basic DNA structure, inheritance, family traits, Introduction to Punnett Squares, and evolution. |
| F. Ecology and Animal Behavior | Habitats, food chains, food webs, ecosystems, population, lifecycle.
Animal behavior, migration, hibernation, fixed action patterns.
Classifying organisms based on food, anatomy, systematics, reproduction and its habitat. |

3. Physical Science

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| A. Chemistry Fundamentals | Atoms and molecules, the mole concept, common elements, simple chemical formulas, carbon as the building block of life, and chemical reactions in everyday life. |
| B. Matter and Fluids | States of matter; physical, chemical & biological transformation.
Motion, speed, density.
Properties of static fluids and gases. |
| C. Forces and Motions | Gravitational, magnetic, elastic, and frictional forces.
Changes in shape due to force. |
| D. Energy and Thermal Properties | Kinetic and potential energy, heat, sound, energy conversion, renewable energy, temperature, thermometers, heat transfer as conduction, convection, and radiation. |
| E. Light and Sound | Properties of light, color, and vision.
The mechanics of sound and vibration. |
| F. Electricity and Magnetism | Basic applications and models. |

4. Earth and Solar System

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| A. The Solar System | The Sun, planets, asteroids, and comets.
Earth's rotation and revolution, phases of the moon, eclipses.
Natural and artificial satellites. |
| B. Earth System | Structure, Surface, and the process of Earth formation.
Water and carbon cycles.
Air composition, wind, weather, climate, seasons, gravitation, tides,
and renewable vs non-renewable resources. |
| C. Natural Calamities | Earthquakes, Tsunamis, Cyclone, El Niño and La Niña. |

5. Geography and Environmental Science

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| A. Global Geography | Continents and oceans, major biomes.
Basic cartography, latitude, and longitude. |
| B. Geography and Bangladesh | Bengal Delta formation, Physiographic regions, river networks.
Haor basin, Sundarbans, monsoons, and coastal salinity. |
| C. Environmental Issues | Greenhouse effect, ozone depletion, climate change, acid rain,
Anthropogenic pollution, water crisis, and plastic waste. |
| D. Conservation and Action | Protecting wetlands, forests, and local biodiversity.
Managing natural resources, reforestation vs deforestation, and
human-wildlife relations and conflict. |

6. Biotechnology and Modern Science

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| A. Biotechnology | Simple fermentation, basics of genetic engineering and cloning,
GMOs, and biofuels. |
| B. Modern Applications | Understanding how emerging scientific and technological
developments impact the world and environment. |