

Syllabus



MATHEMATICAL KANGAROO COMPETITION

■ PRE-ECOLIER - 1 & 2 (GRADE- 1 & 2)

- Simple arithmetic operations with 1 digit and 2-digit numbers
- Distinguishing simple figures
- Time, clock. number of days in a week
- Number of months in a year

■ ECOLIER – 1 & 2 (GRADE- 3 & 4)

- Simple arithmetic operations with 1,2,3 and 4-digit numbers
- Recognizing geometric figures.
- A magic square with a sum of 15
- Time, clock. number of days in a week, number of months in a year
- Addition, subtraction, multiplication, division. intersection of sets
- Perimeter and area of a square, a rectangle

■ BENJAMIN- 1 & 2 (GRADE- 5 & 6)

- Addition, subtraction, multiplication, division.
- Magic squares
- Fractions and decimals.
- Clock, a calendar
- Perimeter of a polygon. area of a rectangle and a triangle
- Mathematical logic.
- Lines and rays on a surface
- A cube, a rectangular solid. Acute, right, and obtuse angles.

■ CADET – 1 & 2 (GRADE – 7 & 8)

- Operations on rational numbers
- Powers of natural numbers
- Angles: acute, right, and obtuse
- Equations, inequalities and systems of linear equations
- Area of a rectangle, a triangle and a circle
- Lines and rays on a surface
- Volume and surface area of geometric figures
- Supplementary angles, sum of angles in a triangle and in a quadrilateral
- Mathematical logic

■ JUNIOR – 1 & 2 (GRADE - 9 & 10)

- Operations on real numbers
- Functions, polynomials, equations, inequalities.
- Sequences of numbers
- Elements of combinatorics
- Synthetic & analytic plane geometry

■ STUDENT – 1 & 2 (GRADE – 11 & 12)

- Simple arithmetic operations with 1,2,3 and 4-digit numbers
- Operations on real numbers
- Functions, polynomials, equations, inequalities.
- Sequences of numbers
- Elements of combinatorics
- Synthetic & analytic plane geometry



Syllabus



INTERNATIONAL SCIENCE OLYMPIAD

■ EINSTEIN (Grade -1 & 2):

- Living and non-living things.
- Plant kingdom.
- The world of animals.
- Human body.
- Our basic needs.
- Good habits.
- Safety rules and good manners.
- Our family and surroundings.
- Air, water, weather, and seasons.
- Rocks and minerals.
- Light and shadow.
- The sun, moon, earth, and our surroundings

■ NEWTON (Grade -3 & 4):

- Living and non-living things.
- Plant parts & life.
- Animal's life and their eating habits.
- Birds.
- The human body.
- Matters.
- Our needs.
- Our houses and clothes.
- Safety and first aid.
- Force, work and energy.
- Solids, liquids, gases, and materials.
- Light, sound, and force.
- Rocks and soil.
- Our environment and pollution.
- Materials.
- Air, water, and weather.
- The solar system.
- Measurement standard units.

■ DARWIN (Grade -5 & 6):

- Living & non-living things.
- Transportation system in plants and animals.
- The building blocks of life.
- Food and health.
- Bones and muscles.

- Nervous system.
- Human excretory and blood circulatory system.
- Rocks and minerals.
- Soil.
- The earth, the moon and the sun.
- Our environment, natural disasters and pollution.
- Energy, electricity, magnet and simple machine.
- Our environment.
- Heredity and reproduction.
- Sorting and separation of materials into groups.
- Fibre to fabric.
- Fun with magnets.
- Light, shadow and reflection.
- Garbage in, garbage out.

■ FARADAY (Grade -7 & 8):

- Nutrition in plants and animals.
- Respiration in organisms.
- Transportation in plants and animals.
- Reproduction in plants.
- Acids, bases and salts.
- Changes around us.
- Weather, climate & adaptation of animals to climate.
- Winds, storms and cyclones.
- Natural resources and their conservation.
- Motion and time.
- Electric current and its effects.
- Crop production and management.
- Micro organisms-friend and foe.
- Synthetic fibres and plastics.
- Coal and petroleum.
- Heat, Combustion and flame.
- Adolescence and reproductive health.
- Reproduction in animals.
- Metal and non-metal.
- Force, pressure and friction.
- Sound.
- Chemical effects of electric current.
- Light and our universe.

Syllabus



INTERNATIONAL SCIENCE OLYMPIAD

■ EDISON (Grade -9 & 10):

- Nature of matter and behavior.
- Cell, tissues, organ and organ system.
- Biological diversity, health and diseases.
- Motion and force.
- Work, power and energy.
- Gravitation.
- Sound and sound energy.
- Physical resources.
- Bio-geochemical cycles in nature.
- Food & food production.
- Chemical reactions.
- Acids, bases, and salts.
- Metals and non-metals.
- Carbon compounds.
- Periodic classification of elements.
- Life processes.
- Control and coordination in animals and plants.
- Reproduction.
- Heredity and evolution.
- Light and light energy.
- Effects of the current.
- The magnetic effects of current.
- Sources of energy.
- Our environment.
- Management of natural resources.

■ FRANKLIN (Grade -11 & 12):

- Questions for the Grade 11 & 12 contest will be drawn from common topics in the CBSE, ISC, and IB curriculum.





Syllabus

AMERICAN MATHEMATICS OLYMPIAD

■ GRADE 2

- Place values in the base-ten number system.
- Simple fractions such as halves, thirds, and quarters or fourths.
- Addition and subtraction and related multiplication and division problems involving numbers less than 100.
- Simple number patterns involving addition or subtraction.
- Measuring length, time, and money, and collecting data in real-world contexts.
- Relating numbers less than 100 to points on the number lines.
- Basic counting strategies and reasoning in the context of life-like stories.
- Recognize, count, and see connections among simple 2D shapes such as triangles and rectangles.
- Problem solving strategies in the above areas.

■ GRADE 3

- Place values and number sense in the base ten number system.
- Understanding and solving multiplication and division problems around 100.
- Understanding fractions as numbers and in context, including unit fractions.
- Solving word problems using a modeling approach.
- Measuring length, weight, liquid volume, time, and money.
- Interpreting data from a scaled picture or bar graph.
- Developing concepts of perimeter and area of plane figures.
- Pattern identification and extensions of numbers and shapes.

■ GRADE 4

- Understanding of numbers and operations in the base ten number system.
- Four arithmetical operations on multi-digit whole numbers.
- Building upon the understanding of whole-number addition and multiplication to include fractions.
- Understanding factors, multiples, and divisibility.
- Recognizing patterns in number sequences or shapes to solve problems.

- Properties of two-dimensional shapes, including lines and angles.
- Solving real-world problems involving time, money, distance, weight, and liquid volumes.
- Creating mathematical models to solve challenging word problems.

■ GRADE 5

- The base-ten place value system and operations with integers and decimals to hundredths.
- Use fractions and special percentages as numbers and make sense of their operations in real-world contexts.
- Make sense of number patterns and numerical expressions.
- Use measurements in real-world situations, represent and analyze data using visuals and descriptors such as average, minimum, maximum, median, mode.
- Areas of 2D shapes and volumes of 3D solids and the underlying concepts such as unit squares and unit cubes.
- Graph points, lines, and make sense of simple relations in the Cartesian Coordinate System.
- Counting strategies and chances in real-world contexts.
- Extensions and problem solving scenarios involving one or more of the above ideas.

■ GRADE 6

- Understanding the base-ten number system and its properties.
- Solving arithmetic problems involving whole numbers, fractions, mixed numbers, and decimals.
- Finding factors and multiples of a whole number; understanding prime factorization.
- Understanding data variability and distribution, including related quantitative measures.
- Linear algebraic expressions and inequalities.
- Counting strategies.
- Spatial visualization of 2D and 3D shapes; solving problems involving area, surface area, and volume.
- Extensions and integration of mathematical ideas in the above areas.

■ GRADE 7

- Number systems and their properties; arithmetic operations with rational numbers.
- Proportional relationships and their applications.
- Using and solving linear equations in real-world contexts.
- Operations involving numeric and algebraic expressions and linear equations.
- Construction and properties of geometric figures such as circles, triangles, rectangle, parallelograms, and trapezoids; solving problems involving angles, area, surface area, and volume.
- Counting strategies, number sequences.
- Understanding random sampling, inferences, and probability models.
- Extensions and integrations of the mathematical ideas mentioned above.

■ GRADE 8

- Number systems, irrational numbers, and the nature of place-value number systems.
- Radical expressions and powers with integer exponents.
- Number patterns, arithmetic sequences, algebraic expressions, linear equations, and linear functions.
- The processes and properties of similarity and congruence.
- The Pythagorean Theorem and its applications.
- Properties of 2D and 3D shapes such as triangles, quadrilaterals, cubes, cones, cylinders, and spheres.
- Counting strategies and their applications in approaching probability problems.
- Extensions and problem solving scenarios in the above areas.

■ GRADE 9

- Number systems including place-value systems other than ten; irrational numbers, radical expressions, and definitions of π , e , i , and complex numbers; prime numbers, GCD, LCM, and relatively prime numbers.
- Arithmetic and geometric sequences; linear functions, quadratic functions, exponential function, and their inverses; function graphs; function composition.
- Polynomial arithmetic, factorization, zeros of polynomials; rational expressions and radical expressions.
- Reasoning with equations and inequalities algebraically and geometrically.
- Representing and solving simple systems of equations using matrices; vectors and their operations.
- Properties of common 2D shapes such as triangles, quadrilaterals, and circles.
- Angles related to circles.
- Similarity, congruence and related processes and processes such as dilation, reflection, and rotations.

- The Pythagorean Theorem and its applications in connecting geometry and algebra in the Cartesian System.
- Counting strategies, conditional probability, data analysis, and modeling in real-world contexts.
- Extensions and problem solving scenarios involving one or more of the above ideas.

■ GRADE 10

- Real and complex number systems, vectors, and their representations.
- Expansion and factorization of algebraic expressions; solving word problems using algebra, percentages, rates, money, distance-speed-time relations.
- Exponential and logarithmic functions and their properties.
- Rational, irrational, complex number operations as well as prime factorization, GCD, LCM.
- Similarity and congruence of triangles, properties of angles in a circle.
- Graphs of linear, quadratic, and polynomial functions.
- Arithmetic and geometric sequences and the related processes.
- The Pythagorean Theorem and its extensions and applications with trigonometric functions.
- Counting strategies, probability of single events, multiple events, and conditional probability.
- Trigonometric functions, trigonometric identities, and their applications in real-world contexts.
- Extension and integration of mathematical ideas in the above areas.

■ GRADE 11 & 12

- Number systems including integers, rational numbers, real numbers, and complex numbers; rational exponents; vectors, and matrix quantities.
- Arithmetic operations on polynomials and rational expressions; solving linear and quadratic equations, inequalities, and systems of equations.
- Constructing, transforming, modeling, and graphing linear functions, quadratic functions, exponential functions, logarithm functions, rational functions, and trigonometric functions.
- Arithmetic and geometric sequences.
- Properties of triangles, rectangles, parallelograms, trapezoids, regular polygons, and circles.
- Properties and processes of perpendicular bisectors of segments and angle bisectors.
- Concepts of congruence, similarity, symmetry, and related geometry transformations such as translations, rotations, and reflection.
- Algebra and geometry connections in the Cartesian coordinate system.
- Counting techniques, independence, conditional probability, and rules of probability.
- Extensions and problem solving scenarios in the above areas.

Syllabus



HIPPO ENGLISH OLYMPIAD

- Questions will be drawn from school plus syllabus from different standard curriculum of national and international level.
- The official HIPPO website, <https://hippo-olympiad.org/sample-papers/>, contains sample questions, a detailed description of the three rounds' syllabus, and an online exam.

■ Examination Topics

Topic	A1	A2	B1	B2	C1	C2
Personal Details						
Family & Friends						
Hobbies & Leisure Activities						
Holidays						
Transport						
Weather						
Shopping						
Health & Exercise						
Education						
Work, Jobs & Careers						
Films, Media & Entertainment						
Books and Literature						
News, Lifestyles & Culture						
Environment						
Technology & Science						
Community and Society						
Law and Order						
Abstract topics						

LEGEND: ARE TOPICS COVERED IN THE RESPECTIVE GRADE / CATEGORY