

Syllabus



MATHEMATICAL KANGAROO COMPETITION - 2021

■ PRE-ECOLIER - 1 & 2 (GRADE - 1 & 2)

Simple arithmetic operations with 1 digit and 2-digit numbers. Distinguishing simple figures. Time and clock. Number of days in a week and 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. Magic square with a sum of 15. Time & clock. Number of days in a week & number of months in a year. Addition, subtraction, multiplication and division. Properties of sets. Perimeter and area of square and rectangle.

■ BENJAMIN - 1 & 2 (GRADE - 5 & 6)

Addition, subtraction, multiplication, division. Magic squares, Fractions and decimals. Clock and calendar. Perimeter of a polygon, area of rectangle and 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 rectangle, triangle and 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)

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

Syllabus

■ GRADE 1-4 (PRIMARY 1-4)

Arithmetic and Statistics

Geometry and Mensuration

Solving word problems using model method (or any other non-algebraic methods)

Non-routine problem solving (including number patterns, divisibility tests, spatial visualisation, logic problems and simple cryptarithms)

■ GRADE 5-6 (PRIMARY 5-6)

Arithmetic and Statistics

Geometry and Mensuration

Solving word problems using model method (or any other methods including algebra)

Non-routine problem solving (including number patterns, divisibility tests, spatial visualisation, logic problems and cryptarithms)

■ GRADE 7 (SECONDARY 1)

Arithmetic and Algebra

Geometry, Graphs and Mensuration, Statistics

Non-routine problem solving (including number patterns, divisibility tests, spatial visualisation, logic problems and cryptarithms)

■ GRADE 8 (SECONDARY 2)

Arithmetic and Algebra

Geometry, Graphs and Mensuration, Pythagoras' Theorem, Statistics

Non-routine problem solving (including number patterns, divisibility tests, spatial visualisation, logic problems and cryptarithms)

■ GRADE 9-12 (SECONDARY 3-4, JC1-2)

Arithmetic and Algebra

Geometry, Graphs and Mensuration

Pythagoras' Theorem and Trigonometry

Statistics and Probability

Non-routine problem solving (including number patterns, divisibility tests, spatial visualisation, logic problems and cryptarithms)

Syllabus



SINGAPORE MATH GLOBAL ASSESSMENTS - 2021

Lower Primary Level/Grades 1-4

■ PRIMARY 1/GRADE 1

Numbers up to 20
Time, Length, Shapes, Pictorial graph

■ PRIMARY 2/GRADE 2

Numbers up to 100
Addition & subtraction within 100
Money, Time, Length, 2D Shape, Picture graph

■ PRIMARY 3/GRADE 3

Numbers up to 1000
Addition & Subtraction within 1000
Multiplication and Division of 2,3,4,5 & 10
Length, Mass, Volume, Money, Fractions
Time
Picture Graphs 11. 2-D & 3-D Shapes
Heuristics

■ PRIMARY 3-4/GRADES 3-4

Numbers up to 100 000
Factors and Multiples
4 Operations of Whole Numbers within 100 000
Fractions
Decimals
Time
Area and Perimeter
Angles
Properties of Rectangles and Squares
Line Symmetry
Tables, Bar Graphs & Line Graphs
Money
Length, Mass and Volume
Parallel and Perpendicular Lines
Heuristics

Upper Primary Level to Secondary Level/ Grades 5-11

■ PRIMARY 5-6/GRADES 5-6

Numbers up to 10 million
4 Operations of Whole Numbers within 10 million
4 Operations of Fractions, 4 Operations of Decimals
Ratio, Percentage
Area and Perimeter of Composite Figures, Angles
Properties of Triangles & Quadrilaterals
Volume of Cube and Cuboid, Rate and Speed
Average, Algebra, Pie Graphs, Nets Solid Figures
Heuristics

■ SECONDARY 1/2 / GRADES 7-8

4 Operations of Numbers, Ratio & Proportion,
Percentage, Rate & Speed

■ Algebraic Expressions & Formulae

Functions & Graphs, Equations and Inequalities
Angles, Triangles and Polygons
Congruence and Similarity, Pythagoras' Theorem
Mensuration, Data Analysis

■ SECONDARY 3/4 / GRADES 9-10/11

Numbers and Number Patterns
Angles and Polygons
Mensuration, Arc Length and Area of Sector
Equations, Functions and Polynomials, Inequalities
Indices and Surds, Coordinate Geometry and Circles
Pythagoras' Theorem, Further Trigonometry and
Applications of Trigonometry

■ Trigonometric Functions, Identities and Equations

Congruence and Similarity, Area and Volume of Similar
Figures and Solids
Geometry and Properties of Circles
Set Language and Notation, Probability
Statistical Data Analysis, Vectors in Two Dimensions
Binomial Theorem, Matrices

Syllabus



DOKA (DEPTH OF KNOWLEDGE ASSESSMENT) - 2021

■ PAPER P (YEAR 1 AND 2)

Addition and Subtraction, Comparing
Consecutive Numbers
Distance Line and Intervals
Length, Mass, Mixed Operations
Model Drawing, Money
Multiples and Grouping
Number Line, Time, Transferring

■ PAPER Q (YEAR 3 AND 4)

Before and After, Comparing
Numbers and Pattern
Distance Line and Intervals
Fractions, Length, Making A List/ Table
Mass, Mixed Operations
Model Drawing, Money
Multiples and Grouping
Time and Calendar, Transferring, Volume

■ PAPER R (YEAR 5 AND 6)

Average, Area and Perimeter
Before and After, Comparing
Numbers and Pattern, Fractions
Making A List/ Table, Measures and Units
Model Drawing, Mixed Operations
Percentages, Ratios, Speed, Transferring

■ PAPER S (YEAR 7 AND 8)

Algebraic Expressions, Circles, Counting
Linear Inequalities, Measures and Units
Percentages, Plane and Solid Geometry
Probability, Pythagoras' Theorem
Ratios, Rates and Proportions
Quadratic Expressions and Factorisation
Simultaneous Equations
Transformations, Volume

■ PAPER T (YEAR 9 AND 10)

Algebraic Expressions, Bearing
Circle Theorems, Coordinate Geometry
Indices and Rules
Measures and Units
Plane and Solid Geometry
Probability, Pythagoras' Theorem
Rationalise the Denominator
Quadratic Expressions and Factorisation
Set and Venn Diagrams
Ratios, Rates and Proportions
Simultaneous Equations
Transformations
Trigonometry and Rules, Vector

■ PAPER U (YEAR 11 - 13)

Algebraic Expressions, Bearing
Circle Theorems
Coordinate Geometry
Indices and Rules
Measures and Units
Plane and Solid Geometry
Probability, Pythagoras' Theorem
Rationalise the Denominator
Quadratic Expressions and Factorisation
Set and Venn Diagrams
Ratios, Rates and Proportions
Simultaneous Equations
Transformations
Trigonometry and Rules
Vector
Differentiation and Integration
Matrices and Multiplication
Combination and Permutation

Syllabus



AMERICAN MATHEMATICS OLYMPIAD - 2021

■ GRADE 2-4 (PRIMARY 2-4)

Arithmetic and Statistics
Geometry and Mensuration
Solving word problems using model method (or any other non-algebraic methods)
Non-routine problem solving (including number patterns, divisibility tests, spatial visualisation, logic problems and simple cryptarithms)

■ GRADE 5-6 (PRIMARY 5-6)

Arithmetic and Statistics
Geometry and Mensuration
Solving word problems using model method (or any other methods including algebra)
Non-routine problem solving (including number patterns, divisibility tests, spatial visualisation, logic problems and cryptarithms)

■ GRADE 7 (SECONDARY 1)

Arithmetic and Algebra
Geometry, Graphs and Mensuration
Statistics
Non-routine problem solving (including number patterns, divisibility tests, spatial visualisation, logic problems and cryptarithms)

■ GRADE 8 (SECONDARY 2)

Arithmetic and Algebra
Geometry, Graphs and Mensuration
Pythagoras' Theorem
Statistics
Non-routine problem solving (including number patterns, divisibility tests, spatial visualisation, logic problems and cryptarithms)

■ GRADE 9-10 (SECONDARY 3-4)

Arithmetic and Algebra
Geometry, Graphs and Mensuration
Pythagoras' Theorem and Trigonometry
Statistics and Probability
Non-routine problem solving (including number patterns, divisibility tests, spatial visualisation, logic problems and cryptarithms)

■ GRADE 11-12 (JUNIOR COLLEGE 1-2)

Arithmetic and Algebra
Geometry, Graphs and Mensuration
Pythagoras' Theorem and Trigonometry
Statistics and Probability
Non-routine problem solving (including number patterns, divisibility tests, spatial visualisation, logic problems and cryptarithms)

Syllabus



VANDA International Science Competition - 2021

■ GRADE 3-4 (PRIMARY 3-4)

Diversity of living and non-living things
Diversity of Materials
Cycles in plants and animals
Cycles in matter and water Plant system
Human system
Solar system Interaction of forces
Energy forms and uses

■ GRADE 5-6 (PRIMARY 5-6)

Diversity of living and non-living things
Diversity of Materials
Cycles in plants and animals
Cycles in matter and water Plant system
Human system
Cell system
Electrical system
Solar System
Interaction of forces
Interaction within the environment Energy forms
and uses
Energy conversion

■ GRADE 7-8 (SECONDARY 1-2)

Exploring Diversity of Matter by their Physical Properties
Exploring Diversity of Matter by its Chemical
Composition
Exploring Diversity of Matter Using Separation
Techniques
Understanding Diversity of Living Things Model of
Cells – the Basic Units of Life
Model of Matter – The Particulate Nature of Matter
Model of Matter - Atoms and Molecules
Ray Model of Light
Transport System in Living Things
Human Digestive System
Human Sexual Reproductive System

Electrical Systems
Interactions through the application of forces
Energy and Work Done
Transfer of Sound Energy through Vibrations
Effects of Heat & its Transmission
Chemical Changes
Interactions within Ecosystems

■ GRADE 9 (SECONDARY 3)

Experimental Chemistry
The Particulate Nature of Matter
Formulae, Stoichiometry and the Mole
Electrolysis
Energy from Chemicals
Chemical Reactions Cells Structure and
Organisation
Movement of Substances
Biological Molecules
Nutrition in Humans
Nutrition in Plants
Transport in Flowering Plants
Transport in Humans

■ GRADE 10 (SECONDARY 4)

Acids, Bases and Salts
The Periodic Table
Metals
Air
Organic Chemistry
Excretion in Humans
Homeostasis
Co-ordination and Response in Humans
Reproduction
Cell Division
Molecular Genetics
Inheritance
Organisms and their Environment

Syllabus



HIPPO ENGLISH OLYMPIAD - 2021

- Questions will be drawn from school plus syllabus from different standard curriculum of national and international level.
- Sample questions and the online exam can be taken from the official HIPPO website: <https://www.hippo-competition.org/eng/practice.html>

■ 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