

**Syllabus of Mathematics**  
**(For Final and International Round)**

Kindergarten Group (Category 1)

- Addition with 1-digit numbers without carrying
- Subtraction on 1-digit numbers without carrying
- Balance Problem
- Basic number pattern and figure pattern
- Odd and Even numbers
- Counting 2-D and 3-D shapes
- Arranging the number in order
- Creating 3 digit numbers
- Comparing numbers
- Matching Equation
- Counting numbers of sides and interior angles
- Basic Number sequence

Grade 1 – 2 (Category 2)

- Basic number pattern and sequence
- Age and Date problem
- Addition 2 digits with carrying
- Subtraction 2 digits with carrying
- Odd and Even
- Counting on 2D and 3D shapes
- Basic Arithmetic pattern
- Simple Combination
- Finding squares and triangles
- Balance problem
- Counting on numbers of sides and angles
- Formation of 3-digit numbers

Grade 3 – 4 (Category 3)

- Addition and subtraction 3 digits with carrying

- Sum, different and multiples of number sentence
- IQ age problem and date problem
- Pigeonhole problem
- Basic concept about area and perimeter
- Guess on 3 digits numbers
- Chicken and rabbit theorem
- Counting on numbers of 2 D shapes
- Counting on the number of Vertices, Faces and Edges of 3-D figure
- Finding lines segments and intersection point
- Basic routing problem
- L.C.M and H.C.F

#### Grade 5 – 6 (Category 4)

- Chicken and rabbit problem
- Pigeon Hole problem
- Speed and Time problem
- Calculation with decimal and fraction
- Area and perimeter of 2D shapes
- Excess and shortage problems
- Finding volume and surface area of 3D shapes
- Sum of positive numbers series
- Combinations and permutation
- Basic probability
- Method of difference equation
- Guess on 4 digits numbers

#### Grade 7 – 8 (Category 5)

- Speed, distance and time problems
- Algebraic expression
- Basic Inequalities
- Pigeonhole theorem (Hard)
- Routing problem (Hard)
- Linear equation
- Volume and surface area of 3D shapes
- Factor theorem
- Distributions (Hard)
- Combination and permutations
- Counting on possible solution on Indefinite equations
- Pythagorean Theorem

#### Grade 9 – 10 (Category 6)

- Four arithmetical operations on rational numbers and irrational numbers; HCF, LCM, square roots, cube roots, primes, prime factorization and relatively prime
- Length, mass, volume, time, money; percentage (including simple and compound interest formulae), ratio, rate, distance, speed, map scales, direct and inverse proportions
- Expansion and factorization of algebraic expressions; three perfect squares identities; linear and quadratic expressions, equations (including quadratic formula) and inequalities; solving word problems using algebra
- Graphs of linear (including distance-time and speed-time graphs, and gradient of straight line), quadratic and power functions ( $y = a x^n$  for  $n = -2, -1, 0, 1, 2, 3$ )
- Standard form, indices (including zero, negative and fractional indices) and surds (including rationalizing denominator)
- Remainder and factor theorems; solving of cubic equations by factorization; two perfect cubes identities (i.e. sum and difference of perfect cubes); partial fractions; binomial theorem
- Properties of rectangle, square, triangle, parallelogram, rhombus, trapezium, kite and regular polygons; perpendicular bisector and angle bisector; exterior angle of triangle, sum of interior angles of polygon and sum of exterior angles of polygon; angles associated with parallel lines (corresponding angles, alternate angles and interior angles)
- Congruence tests for triangles, Area and perimeter of triangle, rectangle, square, parallelogram and trapezium;
- Probability of single events
- Circumference of circle; volume and surface area of prism, cylinder, pyramid, cone and sphere; arc length, sector area and area of segment of circle (where angles are in degrees and in radians)
- Pythagoras' theorem and its converse; and generalized Pythagoras' theorem
- Trigonometric ratios of acute and obtuse angles; sine rule; cosine rule; 3D problems
- Picture graphs (or pictograms), bar graphs, tables of values, line graphs, pie charts, histograms for ungrouped and grouped data; average (mean, median and mode)
- Simple Venn diagrams
- Divisibility tests and combined divisibility tests
- Number sequences and patterns (including formula to find  $1 + 2 + 3 + \dots + n$ , i.e.  $(n+1)2$ , and formula for general term of arithmetic progression, i.e.  $T_n = a + (n - 1) d$ , although students can use other methods)
- Counting (e.g. no. of terminal zeros)
- Logarithms

- Derivative and Integrals
- Logic problems and Cryptarithms

#### Grade 11 – 12 (Category 7)

- Four arithmetical operations on rational numbers and irrational numbers; HCF, LCM, square roots, cube roots, primes, prime factorization and relatively prime
- Length, mass, volume, time, money; percentage (including simple and compound interest formulae), ratio, rate, distance, speed, map scales, direct and inverse proportions
- Expansion and factorization of algebraic expressions; three perfect squares identities; linear and quadratic expressions, equations (including quadratic formula) and inequalities; solving word problems using algebra; modulus functions (excluding graphs)
- Graphs of linear (including distance-time and speed-time graphs), quadratic and power functions ( $y = a x^n$  for  $n = -2, -1, 0, 1, 2, 3$ )
- Coordinate geometry formulae (gradient, length of line segment, midpoint, perpendicular lines, and shoelace formula)
- Standard form, indices (including zero, negative and fractional indices) and surds (including rationalizing denominator); logarithms (including product law, quotient law, power law and change of base formula)
- Remainder and factor theorems; solving of cubic equations by factorization; two perfect cubes identities (i.e. sum and difference of perfect cubes); partial fractions; binomial theorem
- Properties of rectangle, square, triangle, parallelogram, rhombus, trapezium, kite and regular polygons; perpendicular bisector and angle bisector
- Exterior angle of triangle, sum of interior angles of polygon and sum of exterior angles of polygon; angles associated with parallel lines (corresponding angles, alternate angles and interior angles)
- Symmetric and angle properties of circles
- Congruence and similarity tests for triangles
- Area and perimeter of triangle, rectangle, square, parallelogram and trapezium; area and
- Circumference of circle; volume and surface area of prism, cylinder, pyramid, cone and sphere; arc length, sector area and area of segment of circle (where angles are in degrees and in radians)
- Pythagoras' theorem and its converse; and generalized Pythagoras' theorem
- Trigonometric ratios of angles in all quadrants; sine rule; cosine rule; 3D problems; angle of elevation, angle of depression and bearings; graphs of sine, cosine and tangent functions; cosecant, secant and cotangent; trigonometric identities, formulae and equations

- Picture graphs (or pictograms), bar graphs, tables of values, line graphs, pie charts, histograms for ungrouped and grouped data; average (mean, median and mode)
- Probability of single and combined events (including additive law for mutually exclusive events, multiplicative law for independent events, possibility diagrams, tree diagrams and probability trees for independent and dependent events; but excluding non-mutually exclusive events and
- Bayes' theorem (for conditional probabilities)
- Divisibility tests and combined divisibility tests
- Number sequences and patterns (including formula to find  $1 + 2 + 3 + \dots + n$ , i.e.  $(n+1)2$ , and formula for general term of arithmetic progression, i.e.  $T_n = a + (n - 1) d$ , although students can use other methods)
- Counting (e.g. no. of terminal zeros)
- Simple Venn diagrams
- Logarithms, Derivative and Integrals
- Logic problems and Cryptarithms

**Syllabus of English**  
**(For Local and International Round)**

**Kindergarten (Category 1)**

- Jumbled Letters, Words : Their Meanings and Opposites, Identify the Word From the Picture, Making a Word, Word Power, Feminine and Masculine, One and Many, Word Pairs, Odd One Out.
- Animals : Their Babies, Sounds and Groups.
- Nouns, Pronouns, Verbs, Conjunctions, Articles, Prepositions, Adjectives, Basic tenses, Punctuation.
- Comprehension (Prose and Poetry), Picture Composition and Written Expression.
- Higher Order Thinking Questions

**Class 1 – 2 (Category 2)**

- Collocations, Synonyms, Antonyms, Identify the word from the Picture, Words Related to Animals, Phrases, Idioms, Nouns, Pronouns, Verbs, Adverbs, Adjectives, Articles, Prepositions, Conjunctions, Contractions, Word order, Punctuation, Simple tenses.
- Search for and retrieve information from various text types like stories and look for specific information in short texts like messages, invitations, etc.
- Ability to understand situation-based variations in functions like thanking, greeting, asking for permission, introducing (oneself), etc.
- Higher Order Thinking Questions

### **Class 3 – 4 (Category 3)**

- Homophones, Collocations, Spellings, Gender, Singular-Plural, Words related to animals, Household things, Clothes, Basic emotions, Food, Animals and Pets, etc.
- One word Substitution, Synonyms, Antonyms, Nouns, Verbs, Adverbs, Adjectives, Contractions, Articles, Prepositions, Conjunctions, Tenses, Punctuations and Jumbled words, Basic Questions, Question Tags, Proverbs, Idioms, Word order, etc.
- Understand information through pictures, Time-table format, etc.,
- Acquire broad understanding of and look for specific information in short texts like messages, Invitations, etc.
- Ability to understand situation-based variations in functions like apology, greeting, introduction, request, etc.
- Higher Order Thinking Questions

### **Class 5 – 6 (Category 4)**

- Collocations, Idioms, Homonyms and homophones, Synonyms, Antonyms, Nouns, Pronouns, Verbs and Phrasal Verbs, Adverbs, Adjectives, Articles, Prepositions, Conjunctions, Punctuation and Jumbled Words, Tenses, Narration, etc.
- Collocations, Phrasal verbs, Idioms, Synonyms, Antonyms.
- Understand information given in News reports, Time-tables, Messages, etc.
- Acquire broad understanding of and look for specific information in short texts like messages, menu card, etc.

- Ability to understand situation-based variations in functions like Requests, Refusals, Apologies, Word order, etc.
- Higher Order Thinking Questions

### **Class 7 – 8 (Category 5)**

- Collocations and Words related to Travel, Locations, Activities, Homonyms and Homophones, etc.
- Synonyms, Antonyms, Analogies and Spellings, Collocations, Phrasal Verbs, Idioms or Proverbs, Homonyms and Homophones, One word, Nouns, Pronouns, Verbs, Adverbs, Adjectives, Articles, Prepositions, Prepositional Phrases, Participle Phrases, Conjunctions, Determiners, Jumbled Words and Punctuations, Tenses, Question Tags, etc.
- Words related to leisure, Household items/issues, Social causes, Outdoor locations and activities, etc.
- Understand information presented in instruction manual format, Message format and others. Acquire broad understanding of and look for specific information in longer texts like Editorials, etc.
- Ability to understand situation-based variations in functions like requesting, Giving information, Expressing surprise, Pronunciation, Word order,
- Higher Order Thinking Questions

### **Class 9 – 10 (Category 6)**

- Synonyms, Antonyms, Analogies, One word, Word order, Nouns, Pronouns, Verbs, Adverbs, Adjectives, Articles, Prepositions, Conjunctions, Punctuations, Jumbled words, Voices, Concord, Question forms, Tenses, Conditionals, Modals. Collocations, Phrasal verbs, Idioms, Homonyms and homophones, Words related to social cause, Travel, Workplace, Weather, Countries, Language and people, Global problems, etc.
- Search for and retrieve information from various text types like Encyclopedias, Dictionaries, etc.
- Understand information presented in instruction manual format, Message format and others
- Ability to understand situation-based variations in functions like Giving/accepting compliments, Agreeing, Disagreeing, Requesting, Seeking information, Pronunciation, Word order, etc.

## **Class 11 – 12 (Category 7)**

- Synonyms, Antonyms, One Word, Word order, Nouns, Verbs, Adverbs, Adjectives, Articles, Prepositions, Conjunctions, Punctuations, Narration, Concord, Question forms, Tenses, Conditionals, Modals, Collocations, Phrasal verbs, Idioms, Homonyms and homophones, Words related to weather, Countries, Language and people, Global problems, etc. and as per your Prescribed Syllabus.
- Search for and retrieve information from various text types like Encyclopedias, Dictionaries, etc.
- Understand information presented in instruction manual format, Message format and others , Acquire broad understanding of and look for specific information in longer texts like editorials, Essays, etc.
- Make inferences from advanced texts and as per your Prescribed Syllabus.
- Ability to understand situation-based variations in functions like Giving/accepting compliments, Agreeing, Disagreeing, Requesting, Word order, Seeking information, Pronunciation, etc

### **SYLLABUS of IQ (Intelligence quotient)**

1) Passwords

2) Figure relations

3) Number series

4) Operations

5) Number – Figure relations

6) Tables

7) Numbers

8) Graphs

9) Perimeter of figures

10) Area of figures

## **SYLLABUS of SCIENCE**

### **Category 1: Grades 3rd – 4th**

Animal kingdom, Knowing Birds; Plants: Our Friends; Human Body; Matter; Environment and Atmosphere; Motion and Transport; Natural Resources; Animals; Functioning of Human Body; Measurement, Matter and Materials; Force, Work and Energy; Our Environment; Our Universe;

### **Category 2: Grades 5th – 6th**

Human Body and Nutrition; Plants; Animals; Housing; Soil, Rocks and Minerals; Work, Force, Energy and Simple Machines; Our Environment and Natural Calamities; Our Universe; Light and Sound; Matter; Food; Fibre to Fabric; Grouping Materials and Their Separation; Changes Around Us; Living Organisms and Their Habitats; Body Movements; Motion and Measurement of Distances; Light, Shadow and Reflection; Electricity and Magnets; Environment;

### **Category 3: Grades 7th – 8th**

Nutrition; Fibre to Fabric; Physical and Chemical Changes; Acids, Bases and Salts; Weather, Climate and Adaptations of Animals to Climate; Winds, Storms and Cyclones; Life Processes; Motion and Time; Electricity and Light; Our Environment; Crop Production; Microorganisms; Materials; Coal and Petroleum; Conservation of Plants and Animals; Cell Structure and Functions; Reproduction; Force and Friction; Sound; Chemical Effects of Current; Light; Solar System; Pollution of Air and Water.

### **Category 4: Grades 9th – 10th**

Matter; Atoms and Molecules; Cells; Tissues; Diversity in Living Organisms; Force and Motion; Gravitation; Work, Energy and Sound; Why Do We Fall Ill; Improvement in Food Resources; Chemical Reactions; Acids, Bases and Salts; Metals and Non-Metals; Carbon and

Its Compounds; Periodic Classification of Elements; Life Processes; Reproduction; Control and Coordination; Heredity and Evolution; Light and Human Eye; Electricity and Magnetic Effects of Electric Current; Sources of Energy; Natural Resources; Our Environment;