Mathematics Syllabus
Class VIII

Number System (50 hrs) (67periods)

I. Playing with numbers

- Writing and understanding a 2 and 3 digit number in generalized form (100a + 10b) +c, where a, b, c can be only digits 0-9) and engaging with various puzzles concerning this. (Like finding the missing numerals represented by alphabets in sums involving any of the four operations) Children to solve and create problems and puzzles.
- Number puzzles and games
- Understanding the logic behind the divisibility tests of 2, 3,4, 5, 6, 7,8,9, and 11 for a two or three digit number expressed in the general form.
- General rule of divisibility by any number.

II. Rational Number

- Properties of rational numbers. (including identities).
- Using general form of expression to describe properties. Appreciation of properties.
- Representation of rational numbers on the number line
- Between any two rational numbers there lies another rational number
- Representation of rational numbers as decimal (denominators other than 10, 100,….)
- Representation of decimal numbers (terminating, non terminating but recurring) in rational form.
- Consolidation of operations on rational numbers.
- Word problems on rational numbers (all operations)
- Word problem (higher logic, all operations, including ideas like area)

III. Square numbers, cube numbers, Square roots, Cubes, Cube roots.

- Square numbers and square roots.
- Square roots using factor method and division method for numbers containing.
  a) Not more than 4 digits and
  b) Not more than 2 decimal places
- Pythagorean triplets and problems involving Pythagorean triplets.
- Cube numbers and cube roots (only factor method for numbers containing at most 3 digits).
- Estimating square roots and cube roots. Learning the process of moving nearer to the required number.

Algebra (20 hrs) (27 periods) Exponents & powers

I. Powers

- Decimal numbers in exponential notation.
- Integers as exponents.
- Laws of exponents with integral powers

- Representing large numbers in standard (scientific) notation.

II. Algebraic Expressions

- Addition and subtraction of algebraic expressions
- Multiplications of algebraic expressions (Coefficient should be integers)
- Identities: Derivation and geometric verification of $(a \pm b)^2 = a^2 \pm 2ab + b^2$, $a^2 - b^2 = (a - b)(a + b)$
- Factorization (simple cases only) as examples of the following types $a(x + y)$, $(x \pm y)^2$, $x^2 - y^2$, $(x + a).(x + b)$
- Division of algebraic expression

III. Simple equations

- Solving linear equations in one variable in contextual problems involving multiplication and division (word problems) (with integral coefficient in the equations)

Business Mathematics (25 hrs)

- Compound ratio – Word problems.
- Problems involving applications on percentages, profit & loss, overall expenses, discount, tax. (Multiple transactions) Difference between simple and compound interest (compounded yearly up to 3 years or half-yearly up to 3 steps only), Arriving at the formula for compound interest through patterns and using it for simple problems.
- Direct variation – Simple and direct word problems. Inverse variation – Simple and direct word problems. Mixed problems on direct , inverse variation
- Time & work problems– Simple and direct word problems Time & distance : Simple and direct word problems

Geometry (40 hrs)

I. Construction of Quadrilaterals: (54 periods)

- Review of quadrilaterals and their properties.
- Four sides, one angle
- Four sides, one diagonal
- Two adjacent sides, three angles
- Three sides, two diagonals.
- Three sides, two angles in between.
- Construction of special type of quadrilaterals.

II. Representing 3-D in 2-D

- Identify and Match pictures with objects [more complicated e.g. nested, joint 2-D and 3-D shapes (not more than 2)].
- Drawing 2-D representation of 3-D objects (Continued and extended) with isometric sketches.
- Counting vertices, edges & faces & verifying Euler's relation for 3-D figures with flat faces (cubes, cuboids, tetrahedrons, prisms and pyramids)

III. Exploring geometrical figures

- Congruent figures

- Similar figures
- Symmetry in geometrical figures w.r.t. to triangles, quadrilaterals and circles. Revision of reflection symmetry, rotational symmetry and it's applications
- Point symmetry
- Estimation of heights and distances by similar figures
- Dilations
- Tessellations

Mensuration (15 hrs)

- Area of a triangle: formulae (without proof) and its application in finding the area of a quadrilateral.
- Area of a trapezium
- Area of the quadrilateral and other polygons.
- Area of the circle & circular paths and area of sector – Simple word problems.
- Surface area of a cube, cuboid
- Concept of volume, measurement of volume using a basic unit volume of a cube, cuboid
- Volume and capacity.

Data handling (15 hrs)

- Revision of Mean Median and Mode of ungrouped data.
- Determination of mean by Deviation Method.
- Scope and necessity of grouped data.
- Preparation of frequency distribution table
- Cumulative frequency distribution table
- Frequency graphs (histogram for equal and unequal class intervals, frequency polygon, frequency curve, cumulative frequency curves)