Maths Course Structure - Class VII

Number System (50 hrs)

(i) Knowing our Numbers:Integers

• Multiplication and division of integers (through patterns). Division by zero is meaningless

• Properties of integers (including identities for addition & multiplication, commutative, associative, distributive) (through patterns).

These would include examples from whole numbers as well. Involve expressing commutative and associative properties in a general form. Construction of counterexamples, including some by children. Counter examples like subtraction is not commutative.

• Word problems including integers (all operations)

(ii) Fractions and rational numbers:

• Multiplication of fractions
• Fraction as an operator
• Reciprocal of a fraction
• Division of fractions
• Word problems involving mixed fractions
• Introduction to rational numbers (with representation on number line)
• Operations on rational numbers (all operations)
• Representation of rational number as a decimal.
• Word problems on rational numbers (all operations)
• Multiplication and division of decimal fractions
• Conversion of units (length & mass)
• Word problems (including all operations)

(iii) Powers:

• Exponents only natural numbers.
• Laws of exponents (through observing patterns to arrive at generalisation.)

(i) $a^m\ a^n\ a^{m+n}$

(ii) $(a^m)^n = a^{mn}$

(iii) $a^m/a^n = a^{m-n}$, where $m - n \in N$

Algebra (20 hrs)

ALGEBRAIC EXPRESSIONS

• Generate algebraic expressions (simple) involving one or two variables

• Identifying constants, coefficient, powers

• Like and unlike terms, degree of expressions e.g., x^2y etc. (exponent ≤ 3, number of variables)

• Addition, subtraction of algebraic expressions (coefficients should be integers).

• Simple linear equations in one variable (in contextual problems) with two operations (avoid complicated coefficients)

Ratio and Proportion (20 hrs)

•Ratio and proportion (revision)

• Unitary method continued, consolidation, general expression.

• Percentage- an introduction.

• Understanding percentage as a fraction with denominator 100

• Converting fractions and decimals into percentage and vice-versa.

• Application to profit and loss (single transaction only)

• Application to simple interest (time period in complete years).

Geometry (60 hrs)

(i) Understanding shapes:

• Pairs of angles (linear, supplementary, complementary, adjacent, vertically opposite) (verification and simple proof of vertically opposite angles)

• Properties of parallel lines with transversal (alternate,corresponding, interior, exterior angles)

(ii) Properties of triangles:

• Angle sum property (with notions of proof & verification through paper folding, proofs using property of parallel lines, difference between proof and verification.)

• Exterior angle property

• Sum of two sides of a it's third side

• Pythagoras Theorem (Verification only)

(iii) Symmetry

• Recalling reflection symmetry

• Idea of rotational symmetry, observations of rotational symmetry of 2-D objects. (90^o, 120^o, 180^o)

• Operation of rotation through 90^o and 180^o of simple figures.

• Examples of figures with both rotation and reflection symmetry (both operations)

• Examples of figures that have reflection and rotation symmetry and vice-versa

(iv) Representing 3-D in 2-D:

• Drawing 3-D figures in 2-D showing hidden faces.

• Identification and counting of vertices, edges, faces, nets (for cubes cuboids, and cylinders, cones).

• Matching pictures with objects (Identifying names)

• Mapping the space around approximately through visual estimation.

(v) Congruence

• Congruence through superposition (examplesblades, stamps, etc.)

• Extend congruence to simple geometrical shapes e.g. triangles, circles.

• Criteria of congruence (by verification) SSS, SAS, ASA, RHS

(vi) Construction (Using scale, protractor, compass)

• Construction of a line parallel to a given line from a point outside it.(Simple proof as remark with the reasoning of alternate angles)

• Construction of simple triangles. Like given three sides, given a side and two angles on it, given two sides and the angle between them.

Mensuration (15 hrs)

• Revision of perimeter, Idea of , Circumference of Circle Area Concept of measurement using a basic unit area of a square, rectangle, triangle, parallelogram and circle, area between two rectangles and two concentric circles.

Data handling (15 hrs)

(i) Collection and organisation of data – choosing the data to collect for a hypothesis testing.

(ii) Mean, median and mode of ungrouped data – understanding what they represent.

(iii) Constructing bargraphs

(iv) Feel of probability using data through experiments. Notion of chance in events like

tossing coins, dice etc. Tabulating and counting occurrences of 1 through 6 in a number of throws. Comparing the observation with that for a coin.Observing strings of throws, notion of randomness.