# Mathematics Syllabus
# Class VI

## Number System (60 hrs)

### I. Knowing our Numbers: Consolidating the sense of Numberness up to 99,999 (five digits) Estimation of numbers

- Comparison of numbers
- Place value (recapitulation
- and extension); Connectives: use of
- symbols =, . Word problems on number
- operations involving large numbers up to a maximum of 5 digits in the answer (This would include conversions of units of length & mass from the larger to the smaller units) Estimation of outcome of
- number operations. Introduction to large
- numbers a) up to lakhs and ten lakhs b) up to crores and ten crores Approximation of large
- numbers International system of
- numbers (Millions.) Use of Large numbers in
- daily life situations.

### II. Whole numbers Natural numbers, whole

- numbers Properties of whole
- numbers (closure, commutative, associative, distributive, additive identity, multiplicative identity) Division by zero
- Number line- Binary
- operations (addition, subtraction, multiplication) on the number line Seeing patterns, identifying
- and formulating rules to be done by children. Utility of properties in
- fundamental operations

### III. Playing with Numbers:

- Consolidating divisibility rules of 2,3,5,6,9,10
- Discovering divisibility rules of 4,8,11 through observing patterns.
- Multiples and factors,
- Prime & composite numbers, Co-prime numbers and twin prime numbers, Prime factorization, every
- number can be written as products of prime factors. HCF and LCM, prime• factorization and division method. Property LCM × HCF =product of two numbers.
- LCM & HCF of co-primes.

### IV. Negative Numbers and Integers

- How negative numbers arise, models of negative numbers, connection to daily life, ordering of negative numbers, representation of negative numbers on number line.
- Understanding then definition of integers, identification of integers on the number line
- Comparison of integers, ordering of integers by using symbols

- Operation of addition and subtraction of integers, showing the operations on the number line (Understanding that the addition of negative integer reduces the value of the number)

### V. Fractions and Decimals:

- Revision of what a fraction is, Fraction as a part of whole
- Representation of fractions (pictorially and on number line)
- Fraction as a division, proper, improper & mixed fractions, equivalent fractions, like, unlike fractions.
- Comparison of fractions
- Addition and subtraction of fractions
- Word problems (Avoid large and complicated calculations)
- Review of the idea of a decimal fraction
- Place value in the context of decimal fraction, inter conversion of fractions and decimal fractions (avoid recurring decimals at this stage)
- Word problems involving addition and subtraction of decimals (word problems should involve two operations)
- Contexts: money, mass, length.

## Algebra (15 hrs)

### I. Introduction to Algebra

- Introduction to variable through patterns and through appropriate word problems and generalizations (example $5 \times 1 = 5$ etc.)
- Generate such patterns with more examples.
- Introduction to unknowns through examples with simple contexts (single operations)
- Rules from Geometry and Menstruation.

### II. Simple Equations

- Introduction
- Solution of simple equation by Trial and Error method

## Ratio and Proportion (15hrs)

- Concept of Ratio
- Ratio in different situations.
- Comparison of ratios of different units
- Division of a quantity in a given ratio.
- Proportion as equality of two ratios
- Unitary method (with only direct variation implied)
- Word problems
- Understanding ratio and proportion in Arithmetic.

# Geometry (65 hrs)

## I. Basic geometrical ideas (2-D):

- Introduction to geometry. Its linkage with and reflection in everyday experience.
- Point, Line, line segment, ray.
- Open and closed figures.
- Curvilinear and linear boundaries
- Interior and exterior of closed figures.
- Angle — Vertex, arm, interior and exterior, Triangle — vertices, sides, angles, interior and exterior
- Quadrilateral — Sides, vertices, angles, diagonals, adjacent sides and opposite sides, adjacent and opposite angles (only convex quadrilateral are to be discussed), interior and exterior of a quadrilateral.
- Circle — Centre, radius, diameter, chord, arc, sector, segment, semicircle, circumference, interior and exterior.

## II. Measures of Lines and Angles:

- Measure of Line segment
- Types of angles- acute, obtuse, right, straight, reflex, complete and Zeroes angle.
- Examples of angles in the surroundings.
- Measure of angles
- Classifying angles according to their measure.
- Pair of lines Intersecting and perpendicular lines and parallel lines

## III. Practical Geometry (Constructions)

- Drawing of a line segment (using Straight edged Scale, compasses)
- Construction of circle
- Perpendicular bisector
- Drawing a line perpendicular to a given line from a point a)on the line b)outside the line
- Construction of angles (using protractor)
- Angle equal to a given angle (using compass)
- Angle 60°, 120° (Using Compasses)
- Angle bisector- making angles of 30°, 45°, 90° etc. (using compasses)

## IV. Understanding 3D, 2D shapes

- Identification of 3-D shapes: Cubes, Cuboids, cylinder, sphere, cone, prism (triangular), pyramid (triangular and square) Identification and locating in the surroundings
- Elements of 3-D figures. (Faces, Edges and vertices)
- Polygons- introduction types of polygons, regular polygons

## V. Symmetry: (reflection)

- Observation and identification of 2-D symmetrical objects for reflection symmetry
- Operation of reflection (taking mirror images) of simple 2-D objects
- Recognizing reflection symmetry (identifying axes)
- Demonstrates an under standing of line symmetry by (one line) linear symmetry.
- Multiple lines of symmetry.
- Creating symmetrical 2-D shapes.

## Mensuration (15 hrs) Perimeter and Area

- Introduction and general understanding of perimeter using many shapes.
- Shapes of different kinds with the same perimeter.
- Perimeter of a rectangle – and its special case – a square.
- Perimeter of regular polygons
- Deducing the formula of the perimeter for a rectangle and then a square through pattern and generalization.
- Concept of area, Area of a rectangle and a square. Counter examples to different misconcepts related to perimeter and area.
- Word problems on perimeter and area.

## Data handling (10 hrs)

- What is data
- Collection and organisation of data - examples of organizing it in tally marks and a table.
- Pictograph- Need for scaling in pictographs interpretation & construction.
- Bar graphs: Interpreting bar graphs, drawing vertical and horizontal bar graphs for given data.