Number System (60 hrs)

(i) *Knowing our Numbers:* Consolidating the *sense* of numberness up to 5 digits, Size, estimation of numbers, identifying smaller, larger, etc. Place value (recapitulation and extension), connectives: use of symbols =, <, > and use of brackets, word problems on number operations involving large numbers up to a maximum of 5 digits in the answer after all operations. This would include conversions of units of length & mass (from the larger to the smaller units), estimation of outcome of number operations. Introduction to a sense of the largeness of, and initial familiarity with, large numbers up to 8 digits and approximation of large numbers)

(ii) *Playing with Numbers:* Simplification of brackets, Multiples and factors, divisibility rule of 2, 3, 4, 5, 6, 8, 9, 10, 11. (All these through observing patterns. Children would be helped in deducing some and then asked to derive some that are a combination of the basic patterns of divisibility.) Even/odd and prime/composite numbers, Co-prime numbers, prime factorisation, every number can be written as products of prime factors. HCF and LCM, prime factorization and division method for HCF and LCM, the property LCM × HCF = product of two numbers. All this is to be embedded in contexts that bring out the significance and provide motivation to the child for learning these ideas.

(iii) *Whole numbers:* Natural numbers, whole numbers, properties of number (commutative, associative, distributive, additive identity, multiplicative identity), number line. Seeing patterns, identifying and formulating rules to be done be children. *(As familiarity with algebra grows, the child can express the generic pattern.)*

(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. *Children to s*ee patterns, identify and formulate rules. What are integers, identification of integers on the number line, operation of addition and subtraction of integers, showing the operations on the number line (addition of negative integer reduces the value of the number) comparison of integers, ordering of integers.

(v) *Fractions:* 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, comparison of fractions, addition and subtraction of fractions (Avoid large and complicated unnecessary tasks). (Moving towards abstraction in fractions) 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 (two operations together on money, mass, length and temperature)

Algebra (15hrs)

Introduction to Algebra

- Introduction to variable through patterns and through appropriate word problems and generalisations (example 5 × 1 = 5 etc.)

- Generate such patterns with more examples.

- Introduction to unknowns through examples with simple contexts (single operations).

Ratio and Proportion (15 hrs)

- Concept of Ratio
- Proportion as equality of two ratios
- Unitary method (with only direct variation implied)
- Word problems

Geometry (65 hrs)

(i) *Basic geometrical ideas (2 -D)***:** Introduction to geometry. Itslinkage with and reflection ineveryday experience.

- Line, line segment, ray.
- Open and closed figures.
- Interior and exterior of *closed* figures.

- Curvilinear and linear *boundaries*

- Angle — Vertex, arm, interior and exterior,

- Triangle — vertices, sides, angles, interior and exterior, altitude and median

- Quadrilateral — Sides, vertices, angles, diagonals, adjacent sides and opposite side (only convex quadrilateral are to be discussed), interior and exterior of a quadrilateral.

- Circle — Centre, radius, diameter, arc, sector, chord, segment, semicircle circumference, interior and exterior.

ii)*Understanding Elementary Shapes* (*2-D and 3-D*)**:**

- Measure of Line segment

- Measure of angles

- Pair of lines

    - Intersecting and perpendicular lines

    - Parallel lines

- Types of angles- acute, obtuse, right, straight, reflex, complete and zero angle

- Classification of triangles (on the basis of sides, and of angles)

- Types of quadrilaterals – Trapezium, parallelogram, rectangle, square, rhombus.

- Simple polygons (introduction) (Upto octagons regulars as well as non-regular).

- 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)

- Nets for cube, cuboids, cylinders, cones and tetrahedrons.

(iii) *Symmetry:* (*reflection*)

- Observation and identification of 2-D symmetrical objects for reflection symmetry

- Operation of reflection (taking mirror images) of simple 2-D objects • Recognising reflection symmetry (identifying axes)

(iv) *Constructions (using Straight edge Scale, protractor, compasses)*

- Drawing of a line segment

- Construction of circle

- Perpendicular bisector

- Construction of angles (using mprotractor)

- Angle 60°, 120° (Using Compasses)

- Angle bisector- making angles of 30°, 45°, 90° etc. (using compasses)

- Angle equal to a given angle (using compass)

- Drawing a line perpendicular to a given line from a point

    a)on the line b) outside the line.

Mensuration (15 hrs)

Concept of Perimeter and Introduction to Area

Introduction and general understanding *of perimeter* using many shapes. Shapes of different kinds with the same perimeter. Concept of area, Area of a rectangle and a square *Counterexamples to different misconcepts related to perimeter and area.*

Perimeter of a rectangle – and its special case – a square. Deducing the formula of the perimeter for a rectangle and then a square through pattern and generalisation.

Data handling (10 hrs)

(i)   What is data - choosing data to examine a hypothesis?

(ii) Collection and organisation of data - examples of organising it in tally bars and a table.

(iii) Pictograph- Need for scaling in pictographs interpretation & construction.

(iv) Making bar graphs for given data interpreting bar graphs+.