

NCERT Class 7 Maths Syllabus

2022-2023

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:

(iv) Exponents only natural numbers.

(v) Laws of exponents (through observing patterns to arrive at generalisation).

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

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

$$(iii) \quad \frac{a^m}{a^n} = a^{m-n}, \text{ where } m-n \in \mathbb{N}$$

$$(iv) \quad a^m \cdot b^m = (ab)^m$$

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., $x^2 y$ 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 triangle is greater than its third side
- Pythagoras Theorem (Verification only)

(iii) Symmetry

- Recalling reflection symmetry

- Idea of rotational symmetry, observations of rotational symmetry of 2-D objects.

(90° , 120° , 180°)

- Operation of rotation through 90° and 180° 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 (examples-blades, 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, 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.

Disclaimer Dropped Topics

Chapter 1: Integers

Introduction, Recall, 1.4.3 Product of three or more negative numbers, 1.5.7 Making multiplication easier.

Chapter 2: Fractions and Decimals

2.1 Introduction, 2.2 How well have you learned about fractions, 2.5 How well have you, learned about decimals.

Chapter 3: Data Handling

3.1 Introduction, 3.2 Collecting data, 3.3 Organisation of data and 3.9 Chance and probability.

Chapter 4: Simple Equations

4.6 From solution to equation.

Chapter 5: Lines and Angles

5.2.3 Adjacent angles, 5.2.4 Linear pairs and 5.2.5 Vertically opposite angles.

Chapter 7: Congruence of Triangles

7.1 Introduction, 7.2 Congruence of plane figures, 7.3 Congruence of line segments, 7.4 Congruence of angles, 7.5 Congruence of triangles, 7.6 Criteria for the congruence of triangles and 7.7 Congruence among right-angled triangles.

Chapter 8: Comparing Quantities

8.1 Introduction and 8.2 Equivalent ratios.

Chapter 10: Practical Geometry

10.1 Introduction, 10.2 Construction of a line parallel to a given line, through a point not on the line, 10.3 Construction of triangles, 10.4 Constructing a triangle when lengths of its three sides are known (SSS criterion), 10.5 Constructing a triangle when the lengths of two sides and the measure of the angle between them are known (SAS criterion), 10.6 Constructing a triangle when the measures of two of its angles and the length of the side included between them is given (ASA criterion), 10.7 Constructing a right-angled triangle when the length of one leg and its hypotenuse are given (RHS criterion).

Chapter 11: Perimeter and Area

11.1 Introduction, 11.2 Squares and rectangles, 11.2.1 Triangles as parts of rectangles, 11.2.2 Generalising for other congruent parts of rectangles, 11.6 Conversion of units and 11.7 Applications.

Chapter 12: Algebraic Expressions

12.6 Addition and subtraction of algebraic expressions and 12.8 Using algebraic expressions—formulas and rules.