DETAILED SYLLABUS
2024-25

SUBJECT: MATHEMATICS

BOOK

NCERT Mathematics – VIII

GENERAL OBJECTIVES:

1. **Developing Fundamental Mathematical Skills**: Encourage students to develop a strong foundation in fundamental mathematical concepts such as arithmetic operations, algebraic expressions, geometry, and measurement.
2. **Promoting Critical Thinking and Problem-Solving Skills**: Provide opportunities for students to engage in challenging mathematical problems that require critical thinking, logical reasoning, and problem-solving skills.
3. **Enhancing Mathematical Communication**: Improve students' ability to communicate mathematical ideas and reasoning effectively through written and verbal explanations, diagrams, and representations.
4. **Fostering Mathematical Confidence and Persistence**: Support students in building confidence in their mathematical abilities by providing a supportive learning environment where they feel comfortable taking risks and persisting through challenges.
5. **Cultivating Mathematical Connections and Applications**: Help students recognize the relevance of mathematics in everyday life and its connections to other disciplines by exploring real-world applications and interdisciplinary connections.
6. **Encouraging Collaborative Learning**: Foster a collaborative learning environment where students work together to solve problems, discuss mathematical concepts, and share strategies, promoting peer learning and collaboration.
7. **Introducing Advanced Mathematical Concepts**: Introduce students to more advanced mathematical concepts and techniques beyond basic arithmetic, including algebraic equations, geometric properties, and statistical analysis, preparing them for higher-level mathematics courses.
8. **Developing Mathematical Fluency and Efficiency**: Encourage students to develop fluency and efficiency in mathematical calculations and procedures through practice, repetition, and application in various contexts.
9. **Cultivating Appreciation for Mathematics**: Cultivate an appreciation for the beauty, elegance, and utility of mathematics by exploring its historical development, cultural significance, and contributions to human knowledge and innovation.
10. **Preparing for Transition to Higher Education**: Equip students with the necessary mathematical skills, knowledge, and mindset to succeed in higher education and future academic and professional endeavors that require mathematical proficiency.

SPECIFIC OBJECTIVES:

The students will be able to:

1. apply the number concept to Rational numbers
2. use the four basic operations; addition, subtraction, multiplication and division in rational numbers
3. develop reasoning and logical thinking
4. differentiate the concept of area of two dimensional and three-dimensional figures
5. write expressions in algebraic statement and vice versa
6. analyse and synthesise the technique of problem solving
7. develop the ability to estimate, check and verify results
8. calculate orally and mentally
9. analyse, generalise and draw conclusions
10. evaluate with speed, neatness, accuracy and precision in mathematical calculations
11. draw geometrical figures, reading, interpreting graphs, statistical tables and pie charts
12. synthesise operations and concepts learnt in mathematics in day-to-day life

TOPICS:

Chapter 1 - Rational Numbers
Chapter 2- Linear equations in One Variable
Chapter 3 - Understanding Quadrilaterals
Chapter 4 - Data Handling
Chapter 5 - Square and Square roots
Chapter 6 - Cube and Cube root.
Chapter 7 - Comparing Quantities
Chapter 8 - Algebraic Expressions
Chapter 9 - Mensuration
Chapter 10 -Exponent and Powers.
Chapter 11 - Direct and Inverse Proportions
Chapter 12- Factorisation
Chapter 13- Introduction to the Graphs

BOOKS/ ACTIVITIES	SYLLABUS	CONCEPT OBJECTIVES
APRIL 2024		
Course Book	Chapter 1 - Rational Numbers Chapter 5 - Square and Square roots	Students will be able to: • Properties of addition, subtraction, multiplication and division of rational numbers • classify and identify as many rational numbers as possible between two given rational numbers • analyse and represent rational number on a number line • demonstrate, properties of square numbers analyse Pythagorean triplets
Subject Enrichment	**Math Lab Activity** • Analyse the given pattern and find squares of numbers by Vedic math, the column method and the diagonal method on a coloured sheet. • On a coloured sheet make a Crossword with 5 clues across and 5 clues down on square and square roots of natural numbers. **Mental Math** • $-1/2 + 1/4$ • $3^2 + 5^2$	
MAY 2024		
Course Book	Chapter 6 - Cube and Cube root. Chapter 10 -Exponent and Powers.	Students will be able to: • synthesise and demonstrate cube and cube roots of a number. • solve problem with integral exponents • analyse and use the laws of exponent identify and express numbers in standard form.
Subject Enrichment	**Math Lab Activity** • Paste cube of 2 and 3 by paper folding using origami sheets on a coloured sheet • Draw / paste the solar system and find out distance of all the planets in the Solar System from the Sun using Standard Exponential Notations on a coloured sheet. **Mental Math** • $5^3+2^3- 5^3$ • $5^3 \times 5^7$	
Project Work	**Cube Root Clock:** Make a clock using waste material and express the numbers as the cube root eg: $\sqrt[3]{125} = 5$	

PERIODIC ASSESSMENT I

PA I SYLLABUS:

Chapter 1 - Rational Numbers

Chapter 5 - Square and Square roots (Properties of square numbers, patterns, pythagorean triplets, square roots - subtraction and prime factorisation method)

JULY 2024

Course Book	**Chapter 4 - Data Handling** • Frequency distribution table • Histogram • Pie- chart • Probability • **Chapter 9 – Mensuration** • Area of plane figures (Square, Rectangle, Rhombus and Trapezium) • Surface area of Cube, Cuboid and Cylinder • Volume of Cube, Cuboid and Cylinder	Students will be able to: Choose, decide, analyse and evaluate the following: • Collection of data and information, organizing data, construction of circle graph or pie chart • analyse the area of trapezium, area of a general quadrilateral, area of a polygon • synthesise and evaluate from 2D figures the TSA and LSA of cube, cuboid and cylinder • synthesise and evaluate volume of cube, cuboid and cylinder
Subject Enrichment	**<u>Math Lab Activity</u>** • Collect information regarding the mode of transport adopted for coming to school, tabulate the data and represent it in the form of a pie chart on a coloured sheet. • Find the dimensions of the school almanac and compute its area and perimeter on a coloured sheet. • Find and paste the TSA, LSA and volume of a tooth paste cover box to the nearest whole number by actual measurement on a coloured sheet. **<u>Mental Math</u>** • What is the class size of a class interval 15 – 25? • Area of a trapezium whose parallel side are 4cm, 7cm and the perpendicular height between them is 5cm. • TSA and LSA of a cube with side 6cm.	

AUGUST 2024

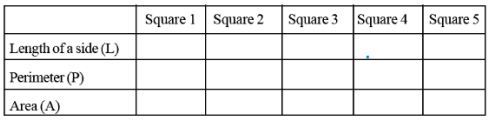
Course Book	**Chapter 9 - Mensuration (Contd.)** **Chapter 11 - Direct and Inverse Proportions** • Application of Direct Proportion • Application of Inverse Proportion	Students will be able to: Analyse, synthesise and evaluate • relationship between two terms when they are in direct proportion • relationship between two terms when they are in inverse proportion

PERIODIC ASSESSMENT II

PA II SYLLABUS:

Chapter 6 - Square and Square roots (square roots - long division method)
Chapter 7 - Cube and Cube root.
Chapter 12 - Exponent and Powers.

SEPTEMBER 2024

Course Book	**Chapter 11 - Direct and Inverse Proportions (Contd.)** • Application of Direct Proportion • Application of Inverse Proportion	Analyse, synthesise and evaluate • relationship between two terms when they are in direct proportion • relationship between two terms when they are in inverse proportion
Subject Enrichment	On a Grid paper, draw five squares of different sizes. Write the following information in a tabular form.  Find whether the length of a side is in direct proportion to: (i) the perimeter of the square. (ii) the area of the square.	

	Square 1	Square 2	Square 3	Square 4	Square 5
Length of a side (L)					
Perimeter (P)					
Area (A)					

Students will revise the concepts learnt for the Mid-Term Examinations.

REVISION AND MID TERM EXAMINATION

MID TERM SYLLABUS

Chapter 1 - Rational Numbers
Chapter 5 - Data Handling
Chapter 6 - Square and Square roots
Chapter 7 - Cube and Cube root.
Chapter 11 - Mensuration
Chapter 12 - Exponent and Powers.
Chapter 13 - Direct and Inverse Proportion.

OCTOBER 2024

Course Book	**Chapter 8 - Algebraic Expressions** •Monomials, Binomials and Trinomials •Operations on algebraic expressions •Algebraic Identities **Chapter 12- Factorisation** •By middle term splitting •By using Identities •Division of Polynomials •Common Errors made in Algebra •Making a factor tree of monomial expression.	Students will be able to: • analyse like and unlike terms • evaluate and demonstrate addition, subtraction, multiplication and division of expressions • analyse and apply the algebraic identities • analyse and synthesise the use of identities to factorise an expression. • analyse and evaluate the division of polynomials by monomial / binomial.

Subject Enrichment	**Math Lab Activity** • Solving for identity (x+a) (x+b) by papercutting & pasting. • Solving for identity $(a+b)^2$ with help of origami sheet and paste it on a coloured sheet. • verify identity $(a-b)^2$ by papercutting & pasting. **Mental Math** Find the errors • $(7x + 5)^2 = 7x2 + 25$ • $9x^2 – 16$	
Project	Write the algebraic expression of the pattern formed by the geometrical shape using matchsticks.	
NOVEMBER 2024		
Course Book	Chapter 12- Factorisation (Contd.) Chapter 2- Linear equations in one variable	Students will be able to: •analyse and solve linear equations •analyse and apply the concept of linear equation in problem solving •synthesise equations reducible to the linear form
Subject Enrichment	**Math Lab Activity** •Draw a zoo / national park with trees and animals on a coloured sheet. Formulate an equation based on the scene drawn in terms of a variable and solve it. **Mental Math** •2x + 3 = 5 find x •10% of x is 5 then what is x?	
DECEMBER 2024		
Course Book	**Chapter 3 – Understanding Quadrilaterals** • Polygons • Angle sum property of polygon • Some special quadrilaterals	Students will be able to: co-relate, analyse and evaluate • problems related to angles of quadrilateral using angle sum property • verify properties of parallelogram and establish the relationship between them through reasoning • generalize properties of different types of quadrilaterals.
Subject Enrichment	**Math Lab Activity** • Verifying Angle sum Property of a quadrilateral by paper cutting and Pasting • Make and paste different types of Quadrilaterals using origami paper on a coloured sheet. **Mental Math** • Two angles of a triangle are 500 and 700, What is the measure of the third angle? • What is the measure of the sum of all the angles of a quadrilateral?	

Multiple Assessment	Verifying the properties of Parallelogram, Rectangle, Rhombus, Square with the help of Trace/ butter paper.	

PERIODIC ASSESSMENT III

PA III SYLLABUS:

Chapter 2- Linear equations in one variable
Chapter 8- Algebraic Expressions
Chapter 12- Factorisation

JANUARY 2025

Course Book	**Chapter 13- Introduction to the Graphs** • Different types of line-graphs • Reading of line-graphs • Co-ordinate plane • Drawing of line graphs **Chapter 7 - Comparing Quantities** • Ratio • Percentage • Compound Interest and Simple Interest	Students will be able to: evaluate and create • a map to attain information and mapping of known areas. • analyse and construct line graphs using information given. • analyse and synthesise the concepts of Ratio, Percentage, Compound Interest and Simple Interest
Subject Enrichment	**<u>Math Lab Activity</u>** • Draw a map of classroom using graph paper and paste it on a coloured sheet. **<u>Mental Math</u>** • In a circular graph we find the central angle out of ____	

FEBRUARY 2025

Course Book	Chapter 7 - Comparing Quantities (Contd.)	Students will revise the concepts learnt for the Annual Term Examinations.

REVISION AND ANNUAL TERM EXAMINATION

ANNUAL TERM SYLLABUS

Chapter 1 - Rational Numbers
Chapter 2- Linear equations in One Variable
Chapter 3 - Understanding Quadrilaterals
Chapter 4 - Data Handling
Chapter 5 - Square and Square roots
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MARCH 2025

ANNUAL TERM EXAMINATION