SUBJECT: MATHEMATICS

BOOK

NCERT Mathematics – VIII

GENERAL OBJECTIVES:

1. **Build Strong Foundations:** Strengthen students' foundational understanding of mathematical concepts introduced in earlier classes, preparing them for more advanced topics**.**

2. **Develop Problem-Solving Skills:** Cultivate students' ability to apply mathematical principles to solve a variety of problems encountered in real-life situations, promoting critical thinking and analytical skills.

3. **Enhance Mathematical Reasoning:** Encourage students to reason mathematically, make conjectures, and justify conclusions using logical arguments, fostering a deeper understanding of mathematical concepts.

4. **Foster Conceptual Understanding:** Focus on developing conceptual understanding rather than rote memorization, allowing students to grasp the underlying principles of mathematical topics.

5. **Promote Mathematical Communication:** Provide opportunities for students to express mathematical ideas clearly and coherently, both orally and in writing, fostering effective communication skills.

6. **Introduce Advanced Topics:** Introduce more advanced topics and techniques in algebra, geometry, data handling, and other areas, gradually building upon the concepts learned in previous classes.

7. **Cultivate Interest in Mathematics:** Engage students with interactive and engaging activities, examples, and problems to foster a positive attitude towards mathematics and promote a lifelong interest in the subject.

8. **Provide a Holistic Learning Experience:** Offer a well-rounded curriculum that integrates mathematical concepts with real-life applications, interdisciplinary connections, and the use of technology where appropriate.

SPECIFIC OBJECTIVES:
The students will be able to:
1. build the number concept
2. perform the four basic operations; addition, subtraction, multiplication and division in integers, fractions and decimals
3. develop reasoning and logical thinking
4. analyse the data using tally marks, bar graph and hence; evaluate mean, median and mode
5. analyse and evaluate the ratio, proportion, percentage, profit and loss
6. identify lines, line segment and angles of polygons
7. evaluate and differentiate between the concept of area and perimeter and apply them in real life situations
8. write expressions in algebraic statement and vice versa
9. develop the ability to estimate, check and verify results
10. calculate orally and mentally
11. analyse, generalise and draw conclusions
12. evaluate with speed, neatness, accuracy and precision in mathematical calculations
13. draw geometrical figures, reading, interpreting graphs, statistical tables and Bar graphs.
14. synthesise operations and concepts learnt in mathematics in day-to-day life

TOPICS:
Chapter 1 - Integers
Chapter 2 - Fractions and Decimals
Chapter 3 - Data Handling
Chapter 4 - Simple Equations
Chapter 5 - Lines and Angles
Chapter 6 - The Triangle and Its Properties
Chapter 7 - Comparing Quantities
Chapter 8 - Rational Numbers
Chapter 9 - Perimeter and Area
Chapter 10 - Algebraic Expression
Chapter 11 - Exponent and Power
Chapter 12 - Symmetry
Chapter 13- Visualising Solid Shapes

BOOKS/ ACTIVITIES	SYLLABUS	CONCEPT OBJECTIVES

APRIL 2024

Course Book	**Chapter 1 – Integers** • Properties of Integers (addition, subtraction, multiplication and division) • Word problems including integers **Chapter 2 - Fractions and Decimals** • Addition, Subtraction, Multiplication and Division of Fraction • Multiplication & Division of Decimal Numbers	Students will be able to: • synthesise and apply properties of integers in basic mathematical operations • synthesise the concept of fractions and decimals • evaluate multiplication and division of fractions and decimals • analyse and apply concept of integers to solve statement problem
Subject Enrichment	**Math Lab Activity** • Coding - Decoding: Integers will be representing alphabets and students will find the hidden message on coloured sheet. **Mental Math** • (-7) + (-2) _____ (+7) – (+2) [<, >, =] • 1/6 of 18?	
Multiple Assessment **AIL Project Work**	**1) Name Fraction** Students will write about how many equal parts are in their name, unit fractions, fractions of vowels, and fraction of consonants. **1) Fraction ROBOT/ BIRD** Students are expected to be able to assemble the Fraction robot and find the shape of the fractions in it.	

MAY 2024

Course Book	**Chapter 2- Fractions and Decimals (contd.)** •Word Problems on Fractions and Decimal Numbers **Chapter 8 - Rational Numbers** • Introduction to rational numbers and their importance • Positive and negative natural numbers and their representation on number line • Rational numbers in standard form • Representation of rational number as a decimal • Comparison of rational numbers • Operations in rational numbers • Word problems on rational numbers (all operations)	Students will be able to: • analyse and recognise rational numbers • represent rational numbers on a number line • evaluate addition and subtraction with rational numbers • analyse and apply concept of rational numbers, fractions and decimals to solve statement problems
Subject Enrichment	**Math Lab Activity** •Draw a number line on coloured sheet and plot the given rational numbers (-1/4, 3/2, -5/2 and 3) **Mental Math** • Is -2/5 a rational number? •Additive inverse of (-3/7) is _____	

<table>
<tr><td colspan="3" align="center">**PERIODIC ASSESSMENT I**</td></tr>
<tr><td colspan="3">PA I SYLLABUS:
Chapter 1 - Integers
Chapter 2 - Fractions and Decimals (till exercise 2.3)</td></tr>
<tr><td colspan="3" align="center">**JULY 2024**</td></tr>
<tr>
<td>**Course Book**</td>
<td>**Chapter 8- Rational numbers (Contd.)**

Chapter 5- Lines and Angles
• Related Angles: Complementary and supplementary angles
• Related Angles: Adjacent, vertically opposite and linear pair of angles
• Pairs of Lines: Intersecting Line and Transversal
• Angles made by transversal
• Transversal of parallel lines
• Check for parallel lines</td>
<td>• analyse the concept of complementary, supplementary, adjacent, vertically opposite and linear pair of angles

• synthesise the concept of intersecting, parallel and transversal lines</td>
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<tr>
<td>**Subject Enrichment**</td>
<td>**Maths Lab Activity**
• Solve Exponents and Powers Crossword on the given Puzzle on coloured sheet.
• Verify that if two lines intersect at a point, then each pair of vertically opposite angles are equal by paper cutting and pasting on coloured sheet.
• To verify that if two parallel lines are cut by a transversal, then
i) each pair of corresponding angles are equal
ii) each pair of alternate interior angles are equal
iii) each pair of interior angles on the same side of transversal are supplementary
 by paper cutting and pasting.

Mental Math
• $132^0 =$
• Supplementary angle of 100^0</td>
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<tr><td colspan="3" align="center">**AUGUST 2024**</td></tr>
<tr>
<td>**Course Book**</td>
<td>**Chapter 5- Lines and Angles (Contd.)**

Chapter 6 - The Triangle and Its Properties
• Medians & Altitudes of a triangle
• Exterior Angle of a triangle & its property
• Angle sum property of a triangle
• Equilateral & Isosceles Triangles
• Sum of the length of two sides of a triangle
• Right-Angled Triangles and Pythagoras Property</td>
<td>•verify properties of triangles (exterior angle, interior angle, angle sum and Pythagorean)
co-relate the properties of triangles in real life problems</td>
</tr>
<tr>
<td>**Subject Enrichment**</td>
<td>(a) To get a median of a triangle from any vertex, by paper folding. To verify that in a triangle, medians pass through a common point, by paper folding.

(b) To get an altitude of a triangle from any vertex, by paper folding. To verify that in triangle altitudes pass through a common</td>
<td></td>
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</table>

	point, by paper folding.	
	(c) To verify that the sum of all interior angles of a triangle is 180^0 by paper cutting and pasting.	
	(d) To verify that an exterior angle of a triangle is equal to the sum of the two interior opposite angles by paper cutting and pasting. (e) To verify that a triangle can be drawn only if the sum of lengths of any two sides is greater than the third side, using broom sticks. Set 1: 5 cm, 7 cm, 11 cm Set 2: 5 cm, 7 cm, 14 cm	
	(f) To verify Pythagoras theorem using a squared paper by shading the squares.	
	Mental Math	
	• If two angles of a triangle are 300 and 500, what is the value of third angle?	

PERIODIC ASSESSMENT II

PA II SYLLABUS:
Chapter 2: Fractions
Chapter 9 - Rational Numbers
Chapter 5- Lines and Angles

SEPTEMBER 2024

Course Book	**Chapter 11 - Exponent and Power** • Exponents: The shorthand for repeated multiplications • Laws of exponents • Decimal number system and expressing large numbers in the standard form	Students will be able to: • express numbers in exponential notation

REVISION AND MID TERM EXAMINATION

MID TERM SYLLABUS
Chapter 1 - Integers.
Chapter 2: Fractions
Chapter 5- Lines and Angles
Chapter 6: Triangle and It's Properties
Chapter 9 - Rational Numbers
Chapter 13- Exponents and Powers

OCTOBER 2024

Course Book	**Chapter 10- Algebraic Expression** • Introduction: Formation of an equation • Terms of an expression: Factors and coefficients of a term • Like and unlike terms: Monomials, Binomials, Trinomials and Polynomials • Addition and subtraction of algebraic expressions • Finding the value of an expression •Using algebraic expression – formulas and rules [Perimeter formula; area formula] • Patterns in numbers and geometry **Chapter 4 - Simple Equations** • Setting up an equation • Solving an equation • Tracing Back: from solution to equation • Application of simple equations to practical situations	*Identify and write terms, factors, co-efficient, like and unlike terms in a given algebraic expression. *Classify expressions as monomial, binomial, trinomial and polynomial. * Add and subtract algebraic expressions * Convert mathematical statements into algebraic expressions. * Find value of given algebraic expression. * Formulate simple equations for perimeter and area
Subject Enrichment	**Math Lab Activity** • Solve Exponents and Powers Crossword on the given Puzzle on coloured sheet. • write the algebraic expression of the pattern formed by the geometrical shape using matchsticks. • In a group of 5, create a riddle on a coloured sheet based on simple linear equation in one variable and solve the same. •They will use different coloured stickers to represent a simple equation and solve it using the balancing method. Various steps will be represented using the coloured stickers. **Mental Math:** •What will be the equation for Two – fifth of u (variable) is 35? •Subtract: $(x + y)$ from $(x - y)$	

NOVEMBER 2024

Course Book	**Chapter 3 - Data Handling** • Data collection and organizing data • Arithmetic Mean & Range • Mean, Median & Mode • Chance & Probability **Chapter 9- Perimeter and Area** • Squares and Rectangles • Triangles as parts of rectangles • Area of a parallelogram & triangle • Circles: Circumference & Area • Conversion of units and its applications	Students will be able to: •analyse and evaluate the data collected, organize it and represent it in tally marks and bar graph •evaluate mean, median and mode of the collected data • analyse and evaluate perimeter and area of polygons (square, rectangle, trapezium, quadrilateral, parallelogram) • calculate area and circumference of a circle • co-relate perimeter and area in objects from day today life
Subject Enrichment	**Math Lab Activity** • Collect the data in a group 7 of number of family members of each student in the class and arrange them in ascending order to find out the mean, median and mode. / To collect, organise, demonstrate and interpret the data collected by the students on their favourite sport. • Any two situations where outcomes do not have equal chances. • Paste cut outs of a square and a rectangle of the same perimeter on a coloured sheet and compare their areas. Which has a greater area?	

	• Verify the formula for the area of a parallelogram by papercutting and pasting. • Verify the formula for the area of a triangle by papercutting and pasting. • Verify the formula for the area of a circle by papercutting and pasting **Mental Math** • What would one use perimeter or area to find the following: a) Space occupied by blackboard. b) Distance covered by taking two rounds of hexagonal park. • Any two situations where outcomes do not have equal chances.	
Multiple Assessment	Students find the perimeter of the first letter of their names.	

DECEMBER 2024

Course Book	**Chapter 9- Perimeter and Area (Contd.)** **Chapter 7 - Comparing Quantities** • Equivalent Ratios • Percentage: Another way of comparing quantities • Converting fractional and decimal numbers to percentage and vice - versa • Uses of Percentage: Interpreting and converting percentages • Uses of Percentage: Ratio to Percent, Increase or Decrease as percent • Profit or Loss as Percentage • Introduction to simple interest for one and multiple years	Students will be able to: • analyse and evaluate equivalent ratio and percentage • represent percentage as decimals and vice - versa • calculate profit and loss by applying the concept of percentage
Subject Enrichment	**Math -O- Shopia (Role Play)** • In a group of 10, imagine the cost price and selling price of any five items and calculate profit or loss of these five items by the buyers.	

PERIODIC ASSESSMENT III

PA III SYLLABUS:

Chapter 3 - Data Handling
Chapter 4 - Simple Equations
Chapter 10- Algebraic Expression

JANUARY 2025

Course Book	Chapter 12 - Symmetry Chapter 13- Visualising Solid Shapes	Students will be able to: • synthesise and demonstrate the line of symmetry of the objects found in the surroundings • evaluate and construct angles, triangles and right-angled triangles with the help of compass • Identify 2- D (circle) and 3-D solid shapes (sphere; ball) • analyse and draw isometric and oblique sketches of solid figures

Subject Enrichment	**Math Lab Activity** •Paste / draw pictures of any five objects; sofa, almirah, chair, table, pencil box, duster, plant on a coloured sheet and draw their line of symmetry. Math Lab Activity: • Draw a cube with given edge (e.g., 5 cm) on an isometric dot paper and draw its oblique sketch on the squared paper. **Mental Math** •What is the order of rotational symmetry of the given figure? • How many edges does a cuboid have?	

FEBRUARY 2025

Course Book	Chapter 13- Visualising Solid Shapes (Contd.)	Students will be able to: • Identify 2- D (circle) and 3-D solid shapes (sphere; ball)
Subject Enrichment	**Math Lab Activity:** •Make the nets of a cube and a cuboid from coloured sheets **Mental Math** •Give the number of faces, edges and vertices of a cone.	

REVISION AND ANNUAL TERM EXAMINATION

ANNUAL TERM SYLLABUS

Chapter 1 - Integers.
Chapter 2- Fractions and Decimals
Chapter 3 - Data Handling
Chapter 4- Simple Equations
Chapter 5- Lines and Angles
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MARCH 2025

ANNUAL TERM EXAMINATION