Syllabus

Number System: (50 hrs) **1. Integers** **2. Fractions, Decimals & Rational Numbers**	**(i) Integers** • Multiplication and division of integers (through patterns). • Properties of integers (including identities for addition & multiplication, (closure, commutative, associative, inverse, distributive) (through patterns). (examples from whole numbers as well). Expressing properties in a general form. Construction of counter examples, (eg. subtraction is not commutative). • Word problems involvingintegers (all operations)
	(ii) Fractions, Decimals and rationalnumbers: • Multiplication of fractions • Fraction as an operator "of" • Reciprocal of a fraction and its use • Division of fractions • Word problems involving mixed fractions (related to daily life) • Introduction to rational numbers (with representation on number line) • Difference between fraction and rational numbers. • Representation of rationalnumber as a decimal. • Word problems on rationalnumbers (all operations) • Multiplication and division of decimal fractions • Conversion of units (length & mass) • Word problems (including all operations)
Algebra (20 hrs) **11. Exponents** **10. Algebraic Expressions** **3. Simple Equations**	**Exponents and powersIntroduction** Meaning of x in a^x where a Ý Z • Laws of exponents (throughobserving patterns to arrive at5 generalization.)whereM, n ∈N(i) $a^m a^n = a^{m?+n}$(ii)? $(a^m)^{?n} = a^{mn}$(iii) $a^m/a^n = a^{m-n}$, where (m-n)∈ N(iv) $a^m.b^m = (ab)^m$(v) number with exponent zerovi)Decimal number in exponential notation vii) Expressing large number in standard form (Scientific Notation)
	ALGEBRAIC EXPRESSIONS Introduction Generate algebraic expressions(simple) involving one or two variables • Identifying constants, coefficient, powers • Like and unlike terms, degree of expressions e.g., x^2y etc.(exponentd"?3, number of variables d"?2) • Addition, subtraction of algebraic expressions (coefficients should be integers).
	Simple equations • Simple linear equations in one variable (in contextual problems) with two operations (integers as coefficients)
6. Ratio - Applications (20 hrs)	• Ratio and proportion (revision) • Unitary method continued,consolidation, generalexpression. • Compound ratio : simple word problems • Percentage- an introduction • Understanding percentage as a fraction with denominator 100 • Converting fractions anddecimals into percentage andvice-versa. • Application to profit and loss (single transaction only) • Application to simple interest (time period in complete years).

Understanding shapes / Geometry **4. Lines and Angles** **5. Triangle and Its Properties** **8.Congurencey of Triangles** **9.Construction of Triangles** **12.Quadrilaterals** **15. Symmetry** **14.Understanding 3D and 2D Shapes**	**(i) Lines and Angles:** • Pairs of angles (linear,supplementary, complementary,adjacent, vertically opposite)(verification and simple proofof vertically opposite angles) • Properties of parallel lines withtransversal (alternate,corresponding, interior, exteriorangles)
	(ii) Triangles: • Definition of triangle. • Types of triangles acc. To sides and angles • Properties of triangles • Sum of the sides, difference of two sides. • Angle sum property (with notion of proof and verification through paper folding, proofs , using property of parallel lines , difference between proof and verification • Exterior angle property of triangle
	(iii) Congruence: • congruence through superposition **ex**. Blades, stamps etc.. • Extend congruence to simple geometrical shapes ex. Triange , circles, • criteria of congruence (by verification only) • property of congruencies of triangles SAS, SSS, ASA, RHS Properties with figures•
	(iv) Construction of triangles (all models) • Constructing a triangles when the lengths of its 3 sides are known (SSS criterion) • Constructing a triangle when the lengths of 2 sides and the measure of the angle between them are known (SAS criterion) • Constructing a triangle when the measures of 2 of its angles and length of the side included between them is given (ASA criterion) • Constructing a right angled triangle when the length of one leg and its hypotenuse are given (RHS criterion)
	(v) Quadrilaterals Quadrilateral-definition. • Quadrilateral, sides, angles, diagonals. • Interior, exterior of quadrilateral • Convex, concave quadrilateral differences with diagrams • Sum angles property (By verification) , problems • Types of quadrilaterals • Properties of parallelogram, trapezium, rhombus, rectangle, square and kite.
	(vi) Symmetry • Recalling reflection symmetry • Idea of rotational symmetry,observations of rotationalsymmetry of 2-D objects. (900,1200, 1800) • Operation of rotation through900 and 1800 of simple figures. • Examples of figures with bothrotation and reflection symmetry(both operations) • Examples of figures that havereflection and rotation symmetryand viceversa

	(vii) Understanding 3-D and 2-D Shapes: • Drawing 3-D figures in 2-Dshowing hidden faces. • Identification and counting ofvertices, edges, faces, nets (forcubes cuboids, and cylinders,cones). • Matching pictures with objects(Identifying names)
Mensuration ***(15 hrs)*** **13. Area and Perimeter**	**Area and Perimeter** • Revision of perimeter and Area of Rectangle, Square. • Idea of Circumference of Circle. • Area of a triangle, parallelogram, rhombus and rectangular paths.
7. Data Handling (15 hrs)	**Data Handling** • Collection and organisation ofdata • Mean, median and mode ofungrouped data – understandingwhat they represent.Reading bar-graphs • Constructing double bar graphs • Simple pie charts with reasonable data numbers

Academic Standards

CONTENT	ACADEMIC STANDARDS	
Number system 1. Integers	**Problem Solving:**	• Solves the problems involving four fundamental operations of integers • Solves the word problems involving the integers. • Used brackets for solving problems to simplify numerical statements.
	Reasoning Proof:	• Explains why the division by zero is meaning less. • Differentiates and compares the set of Natural numbers with integers. • Gives examples and counter examples to the number properties such as closure, Commutative, Associative etc.
	Communication:	• Expressing the number properties of integers in general form. • Uses the negative symbol in different contexts.
	Connections:	• Finds the usage of integers from their daily life situations • Understands the relation among N, W and Z.
	Representation:	• Represents the integers on number line. • Performs the operations of integers on the number line.
2. Fractions, Decimals and Rational numbers	**Problem Solving:**	• Solves the problems in all operation of fractions. • Solves the word problems of all operations of rational numbers. • Solves the problems of all operations of decimal fractions • Converts the small units into large units and vice versa.
	Reasoning : and Proof	• Differentiates rational numbers with fractions. • Justifies density property in rational numbers
	Communication:	• Expresses the need of set of rational numbers • Expresses the properties of rational numbers in general form
	Connections:	• Finds the usage of / inter relation among fractions, rational numbers, and decimal numbers.
	Representation:	• Represents rational numbers on the number line. • Represents the rational numbers in decimal form.
Algebra: 11. Exponents and powers	**Problem Solving:**	• Writes the large numbers in exponential form by using prime factorization
	Reasoning : and Proof	• Generalizes the exponential laws through the observation of patterns
	Communication:	• Understands the meaning of x in a^x where a € z. • Uses of exponential form when using large numbers

	Connections:	• Uses prime factorization in expression of large numbers in exponential form
	Representation:	• Expresses the large numbers in standard form
Algebra: 10. Algebraic Expression 3. Simple Equations	**Problem Solving**	• Finds the degree of algebraic expressions • Doing addition, subtraction of algebraic expressions (Co-efficient should be integers) • Solves the word problems involving two operations (Which can be expressed as simple equation and single variable)
	Reasoning and Proof	• Generates algebraic expressions involving one or two variables by using the patters
	Communication:	• Writes the standard form of first, second, third order expressions in one or two variables • Converts the daily life problems into simple equations. (Contains one variable only)
	Connections:	• Uses closure, commutative etc. properties in addition and subtraction of algebraic expressions. • Uses solving simple equations in daily life situations.
	Representation:	• Represents algebraic expressions in standard forms
6. Ratio - Applications	**Problem Solving**	• Finds the compound, inverse ratio of 2 ratios • Solves word problems involving unitary methods • Solves word problems involving percentage concept • Solves word problems to find simple interest (Time period in complete years)
	Reasoning and Proof	• Compares the decimals, converting into percentages and vice versa. • Formulates the general principles of ratios and proportions
	Communication:	• Expresses the fractions into percentages and decimal forms and their usage.
	Connections:	• Uses profit and loss concepts in daily life situations (Single transactions only) • Understands and uses the solutions for percentage problems in daily life.
	Representation:	• Converts fractions and decimals into percentage form and vice versa.

Understanding Shapes / Geometry **4. Lines and Angles**	**Problem Solving**	• Solves problems on angles made by transversal intersecting parallel line
	Reasoning and proof	• Differentiates the types of pair of angles from given angles • Verifies the parallel ness of the given lines with the use of properties of parallel lines. • Proofs and verifies the angle sum property through paper folding and using property of parallel lines.
	Communication:	• Gives examples of pairs of angles.
	Connections:	• Observes the parallelness in surroundings.
	Representation:	• Represents the notation of angle.
5. Triangle and Its Properties	**Problem Solving**	• Determines whether the given lengths of sides are shapes suitable to make triangle. • Finds the angle which is not given from exterior and other angles of triangle.
	Reasoning and proof	• Makes relationship between exterior angle to its opposite. • Classifies the given triangles on the basis of sides and angles. • Estimates the kind of triangle by observing the given triangle.
	Communication:	• Explains the different types of triangles according to sides and angles. • Explains the property of exterior angle of triangle.
	Connections:	• Uses the concept of triangle.
	Representation:	• _____
8.Congruency of Triangles	**Problem Solving**	• Identifies the congruent triangles from given triangles suitable to make triangle.
	Reasoning and proof	• _____
	Communication:	• Appreciates the congruency in 2-D figures.
	Connections:	• _____
	Representation:	• Represents the congruent triangles using symbols, notation.

9. Construction of Triangles	**Problem Solving**	• Construct triangles using given measurements.
	Reasoning and proof	• _____
	Communication:	• _____
	Connections:	• _____
	Representation:	• _____
12.Quardilateral	**Problem Solving**	• _____
	Reasoning and proof	• Differentiates the convex, concave quadrilaterals. • Verifies and justifies the sum angle property of quadrilaterals.
	Communication:	• Explains the inter relationship between triangle and quadrilateral. • Explains the different types quadrilaterals based on their properties.
	Connections:	• Tries to define the quadrilateral. • Classifies the given quadrilaterals using their properties and their inter relationship.
	Representation:	• _____
15.Symmetry	**Problem Solving**	• Rotate the figure and find its angular symmetry.
	Reasoning and proof	• Can differentiate linear and reflection symmetry using objectives or figures.
	Communication:	• Gives examples that have reflection symmetry.
	Connections:	• _____
	Representation:	• _____

14.Understanding 3-D and 2-D shapes	**Problem Solving**	• Identifying and counting of faces, Edges, Vertices, nets for 3D Fig (Cube, Cuboid, Cone, Cylender).
	Reasoning and proof	• Matches picture with 3-D objects and visualize fells the Faces, Edges, Vertices etc.
	Communication:	• _____
	Connections:	• _____
	Representation:	• Can draw simple 3-D shapes in to 2-D figures.
Mensuration 13. Area and Perimeter	**Problem Solving**	• Solves the problem of Area and perimeter for square, rectangle, parallelogram, triangle and Rhombus shapes of things.
	Reasoning and Proof	• Understands the relationship between square, Rectangle, Parallelogram with triangle shapes for finding the area of triangle. • Understands the Area of Rhombus by using area of triangles.
	Communication:	• Explains the concept of Measurement using a basic unit.
	Connections:	• Applies the concept of Area perimeter to find the daily life situation problems (Square, Rectangle, Parallelogram, Triangle, Rhombus and Circle) • Applies the concept of area of Rectangle, Circle. • Finds the area of the rectangular paths, Circular paths.
	Representation:	• Represent word problems as figures.
7. Data Handling	**Problem Solving**	• Organization of raw data into classified data. • Solves the problems for finding the Mean, Medium, Mode of ungrouped data
	Reasoning	• Understands the Mean, Mode and Medium of ungrouped data and what they represent.
	Communication:	• Explains the Mean, Mode and Medium for ungrouped data.
	Connections:	• Understands the usage of Mean, Mode and Medium in daily life situation problems. • Understands the usage of double graphs and pie graphs in daily life situation (Year wise population, Budget, Production of crops etc.)
	Representation:	• Representation of Mean, Medium and Mode for ungrouped data. • Representation of the data in to double bar graphs and pie graphs.