Mathematics is the Queen of All Sciences

TEACHING PLANS
(Year and Unit Plans)

Subject: MATHEMATICS

8th CLASS

Teaching Plan for

- What to teach
- Why to teach
- How to teach

Name of the Teacher .....

Designation .....

School..... .....

Mandal.....

District.....

PREFACE

In the ever-evolving landscape of school education, particularly in the teaching of Mathematics, the role of a well-structured teaching plan cannot be overstated. Teaching, learning, and assessment are intricately interlinked processes that require thoughtful planning, timely execution, and continuous reflection. In this context, this booklet, titled "Teaching Plans for Classes 6th to 10th – Year Plan & Unit Plan in Mathematics", is a valuable and timely contribution to the professional toolkit of every mathematics teacher.

Effective classroom transaction hinges on meticulous and purposeful planning. Planning acts as the compass that guides teachers through the academic year, ensuring that curricular goals and learning outcomes are achieved within the stipulated timeframe. This booklet offers a comprehensive and structured approach to teaching mathematics, integrating pedagogical expertise with innovative practices in education.

The booklet includes two core planning formats that are essential for successful mathematics instruction:

1. Year Plan – This section provides a macro-level view of the academic year for each class from 6th to 10th. It includes clearly articulated class-wise learning outcomes, monthly allocation of syllabus and units, a detailed period distribution for each unit, essential teaching-learning resources (TLMs, ICT tools, and AI-integrated tools), and a calendar of monthly mathematics activities. Additionally, space for teacher reflections has been included to encourage introspection and self-improvement.
2. Unit Plan – Focusing on the meso level of planning, the unit plans present unit-wise learning outcomes, structured concept maps, clearly demarcated subtopics with associated textbook exercises, and an array of resources such as digital tools, manipulatives, and learning management systems. Each unit includes teacher notes, facilitating a deeper understanding of pedagogical approaches, and provision for teacher reflections and Headmaster's observations for professional dialogue and review.

These plans are more than just templates—they are crafted by a team of eminent and experienced mathematics educators who are well-versed in content, pedagogy, and the practical realities of classroom teaching. As senior resource persons and subject experts, their experience in training teachers, developing curriculum materials, and leading innovative practices in mathematics education adds immense value to this work.

Furthermore, this booklet also includes a Model Teacher Diary, which aims to support reflective teaching. The diary format encourages teachers to document their day-to-day teaching experiences, track student progress, and refine their strategies based on ongoing assessment and classroom feedback.

In the spirit of the National Education Policy (NEP) 2020, which emphasizes competency-based learning, integration of ICT, and continuous professional development of teachers, this booklet aligns with national priorities and classroom

realities. It encourages the use of digital tools, AI, and experiential learning in the teaching of mathematics to improve student engagement and learning outcomes.

It is hoped that this resource will serve as a practical guide and a source of inspiration for all mathematics teachers working in schools. Whether a new teacher seeking guidance or an experienced teacher aiming to refine practice, these plans provide clarity, structure, and motivation. More importantly, they help transform classroom teaching into a meaningful, engaging, and outcome-oriented experience for students.

Let this booklet be a light post guiding every teacher toward creating a vibrant, interactive, and learning-centered mathematics classroom. Through meticulous planning and reflective practice, let us all work toward improving the mathematical abilities of every child.

With sincere appreciation for the teacher community's dedication and commitment to excellence.

Note: *These teaching plans are meant to serve as models only. Teachers may modify or design their own plans based on their convenience and specific classroom needs*.

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TEACHING DIARY

Date:

Teacher Name : ..... Subject: .....

S.No	Period	Class	Name of the Unit/ Chapter	Name of the Sub-topic/Concept	Learning Outcomes to be achieved	Remarks
1						
2						
3						
4						
5						
6						
7						
8						

Signature of the Teacher **Signature of the Headmaster**

SOME USEFUL ICT RESOURCES FOR TEACHING LEARNING AND ASSESSMENT PROCESS IN MATHEMATICS

https://www.nctm.org/pows/

https://www.nctm.org/Classroom-Resources/Illuminations/Interactives/cubes/

https://ncert.nic.in/science-laboratory-manual.php?ln=en

https://ncert.nic.in/exemplar-problems.php?ln=en

https://arvindguptatoys.com/math-magic.php/toys-from-trash.php

https://mathforlove.com/

https://activities.graspablemath.com/

https://mathequalslove.net/

https://apps.mathlearningcenter.org/geoboard/

https://www.geogebra.org/u/community+team

https://www.robocompass.com/

YEAR PLAN

CLASS: 8th

SUBJECT: Mathematics

Number of Allotted Periods: 226 Periods

Learning Outcomes that Students should achieve by the end of the Academic Year:

The learner

- generalises properties of addition, subtraction, multiplication and division of Rational numbers.
- finds out as many rational numbers as possible between two given rational numbers.
- Solves problems of linear equations in one variable, variable present on one side or on both sides.
- constructs different types of quadrilaterals using compasses and straight edge.
- solves problems with integral exponents.
- applies the concept of percent in profit and loss situation, in finding discount, VAT, GST and compound interest.
- e.g. calculates discount percent when marked price and actual price discount are given or finds profit percent when cost price and profit in a transaction are given.
- find squares, cubes, square roots and cube roots of numbers using different methods.
- find Mean, Median and Mode for ungrouped data.
- constructs graphs like histogram, bar graph, frequency polygon, frequency curve and ogive curves for the given data.
- constructs similar, congruent and symmetric figures.
- finds area of a Polygon.
- estimates the area of shapes like trapezium and other polygons by using where square grid/graph sheet and verifies using formulae.
- verifies properties of parallelograms and establishes the relationship between them through reasoning.
- solves problems related to angles of a quadrilateral using angle sum property.
- solves problems based on direct and inverse proportions.
- solves problems related to algebraic addition, subtraction and multiplication.
- uses various algebraic identities in solving problems of daily life situations.

- ❖ solves problems on factorisation and identities of algebraic expressions.
- ❖ represents 3D shapes on a plane surface such as isometric dot sheet.
- ❖ verifies Euler's relation through pattern.
- ❖ finds surface areas and volumes of cube and cuboids.
- ❖ proves divisibility rules of 2,3,4,5,6,7,8,9,10 and 11.
- ❖ solves puzzles with missing digits and based on divisibility rules.

Number of Unit	Name of the Unit	Month	Number of periods required	TLM required	Activities to be conducted	Sign of Subject Teacher	Sign of the Headmaster	Remarks
1	Rational Numbers	June, July	21	Properties of Numbers chart, Number line chart				
2	Linear Equations in One Variable	July	13	Chart of Linear equations in one variable	Preparation of Project and review			
3	Construction of Quadrilaterals	July	13	Geometry Box, Chart of different quadrilaterals chart				
4	Exponents and Powers	August	11	Chart of Exponential Laws				
5	Comparing quantities using proportion	August, September	21	Bills of taxation, chart of principles, profit, loss, simple interest, compound interest	Quiz			
6	Square roots and Cube roots	September	20	Charts of squares, square roots, cubes, cube roots, Models of Unit cubes	Preparation of Project and review			

7	Frequency Distribution Tables and Graphs	September, October	16	Graph Paper, scale, chart of different graphs	Preparation for SA-1 Exams			
8	Exploring Geometrical Figures	November	9	Models of Geometric shapes, graph papers, scale, symmetric models	Preparation of Project and review			
9	Areas of Plane Figures	November	19	Models of Quadrilaterals, triangles, circles, chart of formulae of areas				
10	Direct and Inverse Proportions	November, December	12	Chart of real-life examples				
11	Algebraic Expressions	December	14	Like and unlike terms of Algebraic expressions chart, Chart of identical expressions	National Mathematics Day Celebrations			
12	Factorization	December, January	12	Chart of algebraic identities				
13	Visualizing 3-D in 2-D	January	9	Models of 3-D shapes, isometric dot sheet, scale, unit cubes	Quiz			
14	Surface Area and Volume (Cube and Cuboid)	January, February	10	Models of Cube and Cuboid, unit cubes, chart of formulae	Preparation of Project and review			

15	Playing with Numbers	March	23	Chart of divisibility rules, puzzles and Palindrome numbers				
16	Revision				Preparation for SA-2 Exams			

Academic Standards:

1. Problem Solving
2. Reasoning – Proof
3. Communication
4. Connection
5. Visualization and Representation

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1. RATIONAL NUMBERS

Class: VIII

Name of the Unit: 1. Rational Numbers.

Learning Outcomes: The learner

- Classifies and express the given numbers as different number sets.
- Writes the rational numbers which are in the form of p/q can be expressed as terminating, non-terminating decimals.
- Understands the properties of different number systems based on addition, subtraction, multiplication and division.
- Represents the rational numbers on number line.
- Find the rational numbers between two given rational numbers.
- Converts the number in decimal form into rational form.
- Solves the problems related to rational numbers in real life situations.

Prerequisites: Students must know the following:

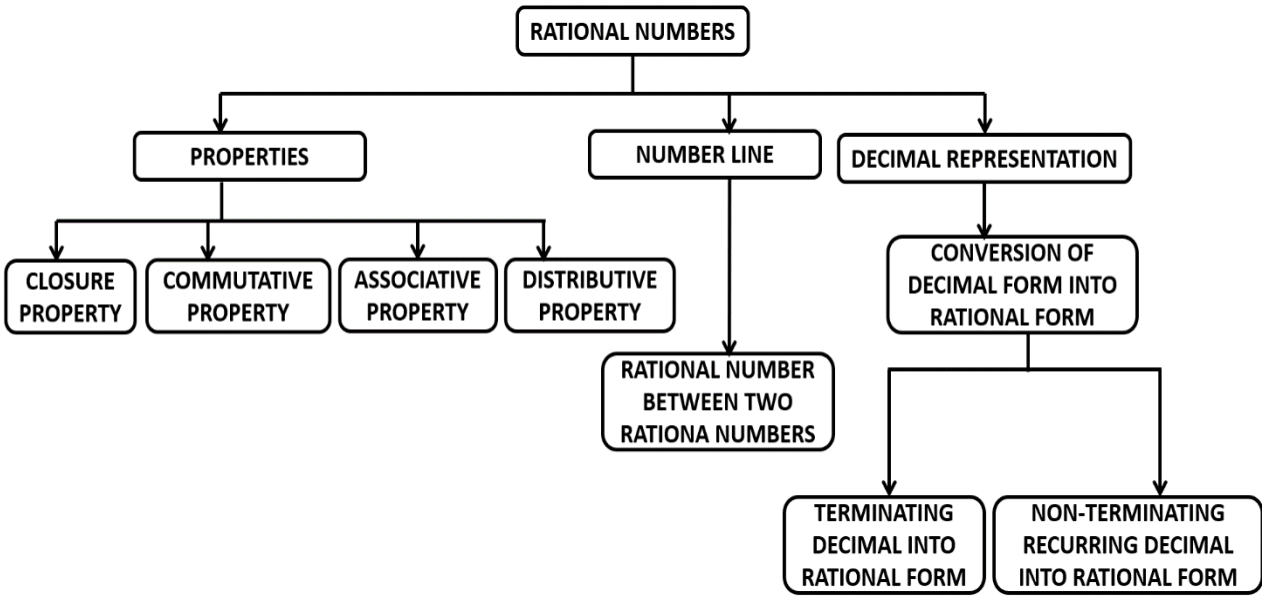
Natural numbers, whole numbers, integers, addition, subtraction, multiplication, division, inverse, representation of integers on number line, terminating and non-terminating recurring decimals, like fractions and unlike fractions.

Number of allotted periods: 21 Periods

Unit/Lesson Name	Sub-topics	Teaching Periods	Remarks
Rational Numbers	1.Introduction of Rational Numbers	1	--
	2. Operations on Rational Numbers (Addition, subtraction, multiplication and division)	4	
	3. Properties of Rational Numbers. Closure Property → whole numbers, integers and rational numbers.	3	
	4. Commutative Property → whole numbers, integers and rational numbers.	2	
	5. Associative Property → whole numbers, integers and rational numbers.	2	
	6. Identity and Inverse Property → whole numbers, integers and rational numbers. Distributivity of multiplication over addition.	2	
	7. Representation of Rational numbers on number line. Rational Number between two rational numbers	2	

	8. Decimal representation of Rational numbers	2	
	9. Conversion from decimal form into rational form. (i) Converting from terminating decimal into rational form	2	
	10 (ii) Converting from non-terminating decimal into rational form	1	
	TOTAL	21	

CONCEPT MAP:



Required TLM: Charts, colour papers, graph papers

ICT TOOLS: IFP, GeoGebra, DIKSHA App , Khan academy.

TEACHER'S REFERENCES :

TEACHER'S REFLECTIONS:

2. LINEAR EQUATIONS IN ONE VARIABLE

Class: VIII

Name of the Unit: 2. Linear Equations in one variable.

Learning Outcomes: The learner

- Explains the general form of a linear equation.
- Classifies and identify whether it is a linear equation or not.
- Solves simple problems based on linear equations.
- Understands types of triangles, exterior angles and angle sum property of a triangle.
- Solves problems of linear equations in one variable, variable present on one side or on both sides.
- Explains transformations of linear equations.
- Understands the concept of parallel lines, a transversal and its angles.
- Reduces equations to simpler form and equations reducible to linear form.
- Converts verbal problems to equations and solve the equations.
- Solves daily life problems using linear equations.

Prerequisites: Students must know the following:

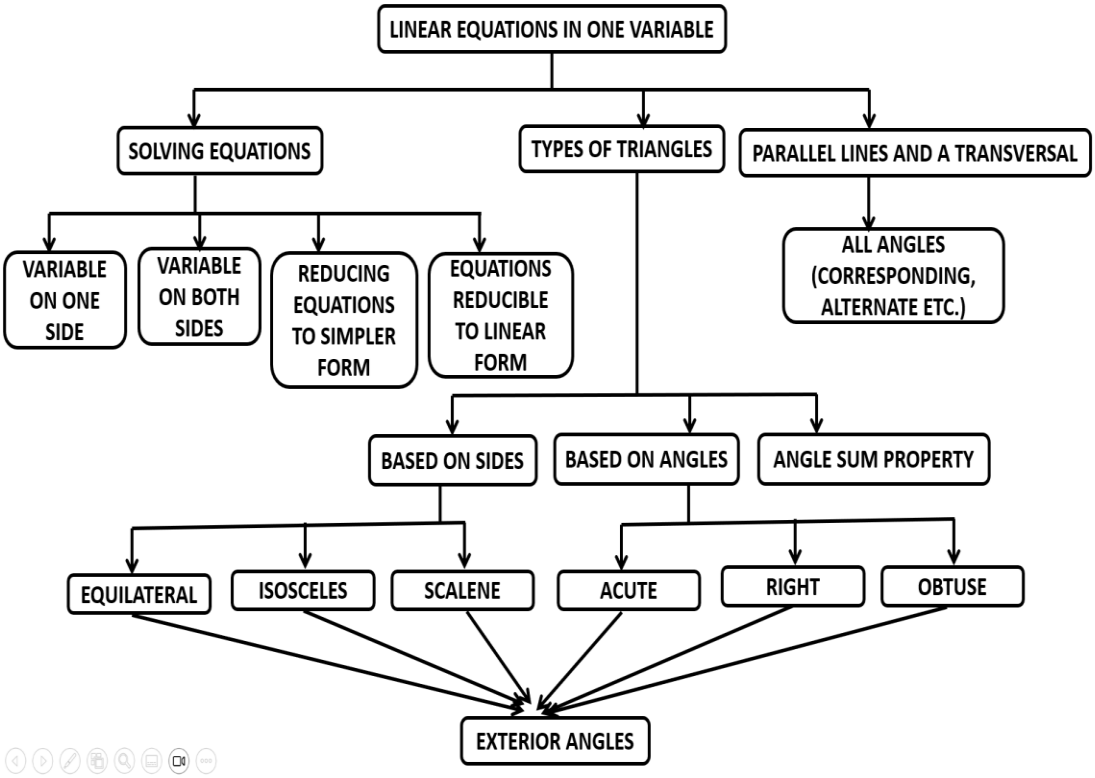
Variable, constant terms, exponents, double, triple, addition, subtraction, multiplication and division of variable terms, transposing of terms, simple equations, verbal problems, convert to simple equations, parallel lines, types of triangles, exterior angles of a triangle.

Number of allotted periods: 13 Periods

Unit/Lesson Name	Sub-topics	No.of. Periods	Practice Periods
Linear Equations in one variable	1.Introduction of Linear equations in one variable	1	
	2. Solving simple equations	2	
	3. Types of triangles, Angle sum property of a triangle, exterior angle of a triangle.	2	
	4. Solving equations that has variables on both sides	2	
	5. Parallel lines, transversal and its angles	2	
	6. Reducing equations to simpler form, equations reducible to linear form	2	
	7. Verbal problems convert to equations and solving the problems.	2	

	TOTAL	13	

CONCEPT MAP:



Required TLM: Charts, colour papers, graph papers, Like and Unlike terms cards

ICT TOOLS : GeoGebra, LMS APP (IFP), DIKSHA APP, KHAN ACADEMY.

TEACHER'S REFERENCES:

TEACHER'S REFLECTIONS:

3. Construction of Quadrilaterals

Class: VIII

Name of the Unit: Construction of Quadrilaterals

Learning Outcomes: The learner

- Name the different types of Quadrilaterals.
- Explains the properties of the different types of Quadrilaterals.
- Gives reasons to state every rectangle is a parallelogram, but every parallelogram is not a rectangle.
- Angles (30°, 45°, 60°, 90°, 120°) can be constructed without using protractor.
- Can draw the perpendicular bisectors and angle bisectors.
- Constructs quadrilaterals by given measurements.
- Explains steps involved in the construction of quadrilaterals.
- The shapes of quadrilaterals can be applied to real life.

Prerequisites: Students must know the following:

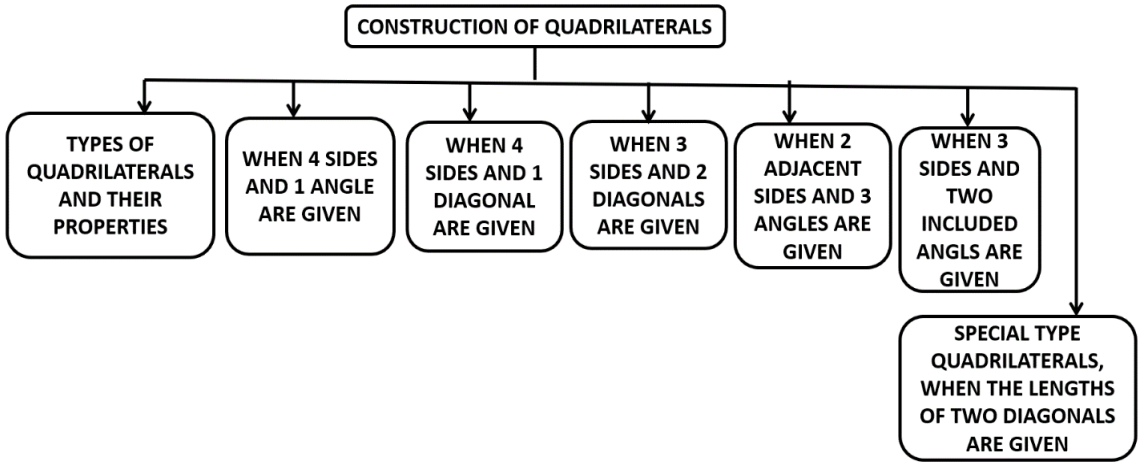
Vertices, sides, angles, diagonals, parallel lines, types of quadrilaterals and their properties, using protractor, drawing arcs using compass, perpendicular lines.

Number of allotted periods: 13 Periods

Unit/Lesson Name	Sub-topics	Teaching Periods	Remarks
Construction of Quadrilaterals	1.Introduction of Quadrilaterals, types of quadrilaterals and their properties.	1	
	2. Constructing angles without using the protractor.	2	
	3. Constructing perpendicular bisector and angle bisector.	2	
	4. Constructing a quadrilateral (i) when the lengths of four sides and one angle are given (S.S.S.S.A.) (ii) when the lengths of four sides and a diagonal are given (S.S.S.S.D.)	2	
	5.(iii) when the lengths of three sides and two diagonals are given. (S.S.S.D.D.) (iv) when the lengths of two adjacent sides and three angles are given (S.A.S.A.A)	2	
	6. (v) when the lengths of three sides and two included angles are given (S.A.S.A.S.)	2	

	7. (vi) The two special type quadrilaterals namely rhombus and square when the two diagonals are given.	2	
	TOTAL	13	

CONCEPT MAP:



Required TLM : Chart of various types of Quadrilaterals, colour papers, graph papers

ICT TOOLS: IFP, GeoGebra, DIKSHA App, Khan academy.

TEACHER'S REFERENCE:

TEACHER'S REFLECTIONS:

4. EXPONENTS AND POWERS

CLASS: VIII

NAME OF THE UNIT: 4. Exponents and Powers

Learning Outcomes: Learners

- Communicates given numbers in exponential form.
- Writes the numbers of exponential form into general form.
- Expands the numbers using exponential laws.
- Solves the problems of Exponential form.
- Explains the change of values of negative exponents.
- Simplifies Exponential problems and give reasons.
- Understands the laws of exponents.
- Compares smallest and largest among the given numbers of exponential form and give reasons.
- Converts the numbers from usual form to standard form and standard form to usual form.
- Identifies the common errors.

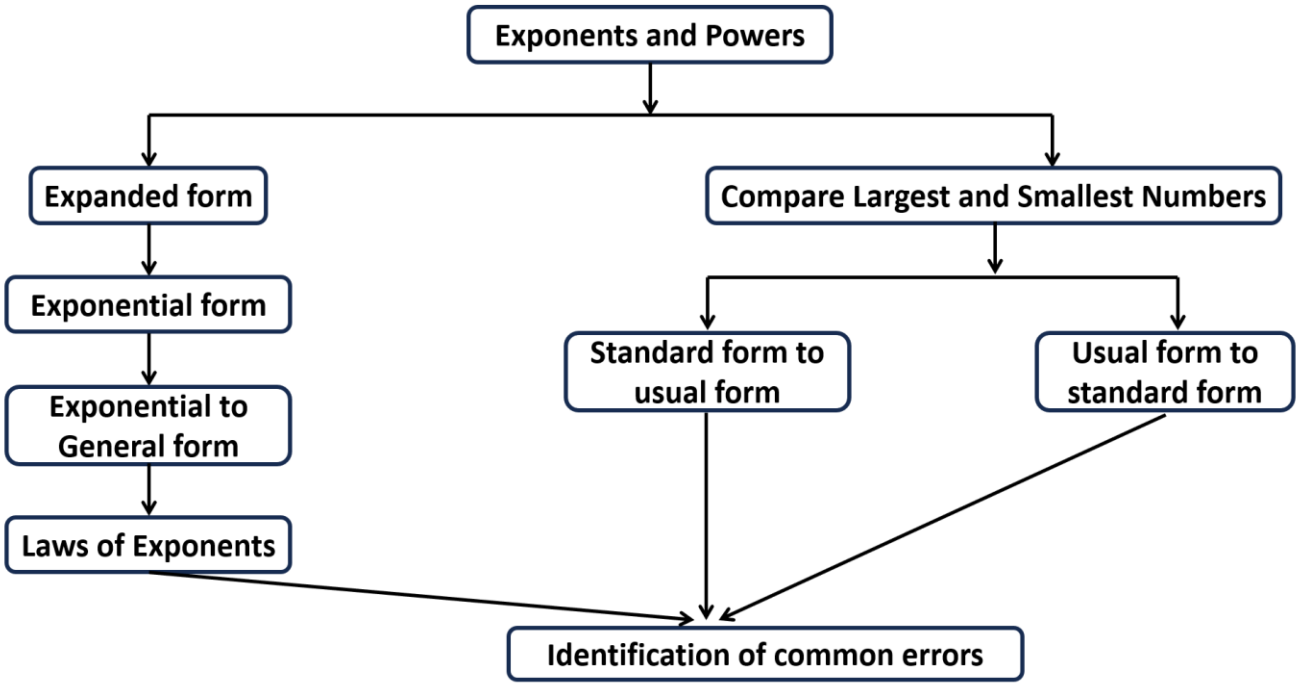
Prerequisites: Students must know the following:

Variable, base, exponents, powers, multiplication, addition, subtraction, division, positive and negative numbers, compare smallest and biggest numbers, decimal form.

Number of allotted periods: 11 periods

Unit/Lesson	Sub-topics	Teaching periods	REMARKS
4. Exponents and Powers	1. Introduction of Exponents and Powers	1	
	2. Expand the numbers using exponents.	2	
	3. Laws of Exponents	2	
	4. Application of express the exponential numbers in standard form	2	
	5. Compare the very large numbers and very small numbers	2	
	6. Identification of common errors	2	
	TOTAL	11	

Concept Map:



Required TLM: Charts, colour papers, graph papers

ICT TOOLS: IFP, GeoGebra, DIKSHA App, Khan academy.

TEACHER'S REFERENCE:

TEACHER'S REFLECTIONS:

5. COMPARING QUANTITIES USING PROPORTION

CLASS: VIII Class

NAME OF THE UNIT: 5. Comparing quantities using proportions.

Learning Outcomes: Learners

- Express the ratios in simplest form.
- Finds compound ratio when two ratios are given.
- Finds percentage, increase or decrease percentage and discounts.
- Solves the problems related to Profit and loss, sales tax/VAT, Goods and services tax (GST).
- Express the formulae for simple interest and compound interest.
- Calculates simple interest and compound interest based on principals.
- Calculates compound interest for 3 months, 6 months, 1 year etc. and gives reasons.
- Express the concepts of verbal problems in ratios.
- Connects problems of ratios to real life.

Prerequisites: Students must know the following :

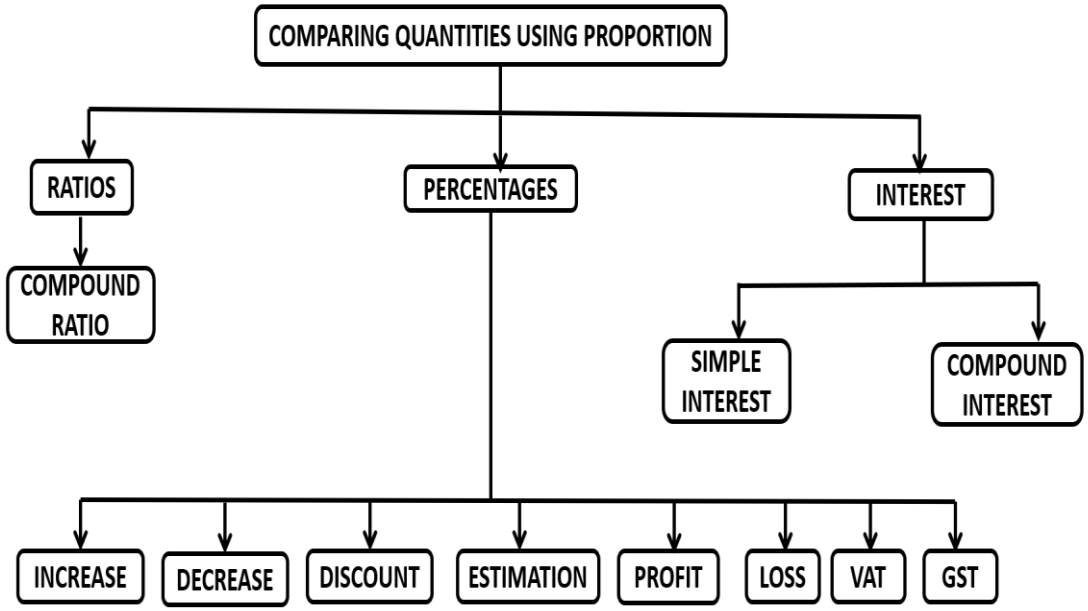
Ratios, quantities, proportion, increase, decrease, compare, percentage.

Number of allotted periods: 19 periods.

Unit/Lesson	Sub-topics	Teaching periods	Remarks
5. Comparing quantities using proportions.	1. Introduction of ratios and compound ratio	1	
	2. percentage, finding the increase and decrease percent	2	
	3. Finding discounts.	2	
	4. Estimation in percentages	2	
	5. Profit and loss and their percentages.	2	
	6. Sales tax, Value added tax (VAT) and Goods and services tax (GST)	2	
	7. Simple interest	2	

	8. Compound interest – Deducing a formula for compound interest.	2	
	9. Interest compounded annually or half yearly	2	
	10. Applications of compound interest formula	2	
	TOTAL	19	

Concept Map:



Required TLM: Charts, colour papers, graph papers

ICT TOOLS: IFP, GeoGebra, DIKSHA App, Khan academy.

TEACHER'S REFERENCE:

TEACHER'S REFLECTIONS:

6. SQUARE ROOTS AND CUBE ROOTS

CLASS: VIII

NAME OF THE UNIT: 6. Square roots and Cube roots

Learning Outcomes: The learner

- Express the patterns of square numbers.
- Differentiates perfect squares and square numbers.
- Communicates the properties of square numbers.
- Express the number of digits in the squares.
- Finds the numbers between the successive square numbers.
- Solves the problems related to finding integers between two square numbers.
- Finds the sum of first n odd numbers without actual addition.
- Finds the square root through subtraction of successive odd numbers.
- Proves the Pythagorean triplets by the suitable formula.
- Explains the unit place of squares and cubes with reasons.
- Solves the problems related to square roots and cube roots.
- Finds the square roots and cube roots by the prime factorization method and division method.
- Finds the square roots of decimal numbers by division method.
- Estimates the square roots and cube roots of the given numbers.
- Represents squares and cubes in different shapes.
- Applies square root and cube root concepts in daily life situations.

Prerequisites: Students must know the following:

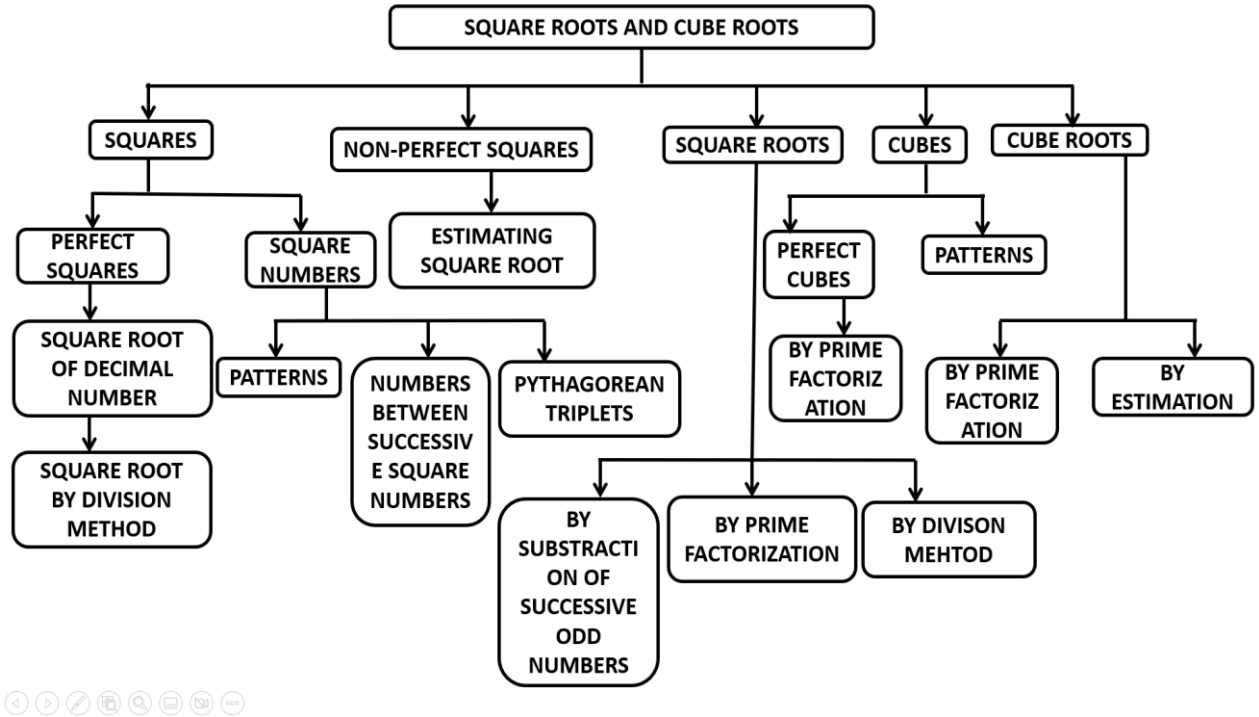
Place values, integers, odd numbers, even numbers, tables, decimal numbers, squares, cubes, shapes of squares and cubes, prime numbers, factors, natural numbers, properties of right-angled triangles, addition, subtraction, multiplication and division.

Number of allotted periods: 20 periods.

Unit/Lesson	Sub-topics	Teaching periods	Remarks
	1. Introduction of squares and their properties	1	
	2. Interesting patterns in squares and numbers between successive square numbers.	2	
	3. Pythagorean triplets.	1	
	4. Square roots and finding the square root through subtraction of successive odd numbers.	2	

Square roots and Cube roots	5. Finding the square root through prime factorization method.	2	
	6. Finding the square root by division method.	2	
	7. Square root of decimal numbers using division method.	2	
	8. Estimating the square roots of non-perfect square numbers.	2	
	9. Some Interesting patterns, cubes and their prime factors.	2	
	10. cube roots and finding the cube roots through prime factorization method.	2	
	11. Estimating the cube root of a number.	2	
	TOTAL	20	

Concept Map:



Required TLM: Charts, colour papers, graph papers

ICT TOOLS: IFP, GeoGebra, DIKSHA App, Khan academy.

TEACHER'S REFERENCE:

TEACHER'S REFELCTIONS:

7. FREQUENCY DISTRIBUTION TABLES AND GRAPHS

CLASS: VIII

NAME OF THE UNIT: 7.Frequency distribution tables and graphs.

Learning Outcomes: The learner

- Understands the relation between class interval, mid value, limits, boundaries for grouped data.
- Understands the relation between inclusive and exclusive classes.
- Estimates mean, median and mode for raw data and give reasons.
- Finds mean, median and mode in different methods for raw data.
- Express the terms like mean, median and mode in their own words.
- Represents the given data through frequency distribution table/cumulative frequency table.
- Constructs graphs like frequency polygon, frequency curve, bar graph, histogram, cumulative frequency curves for the given data.
- Connects the real life situations with graphs.

Prerequisites: Students must know the following:

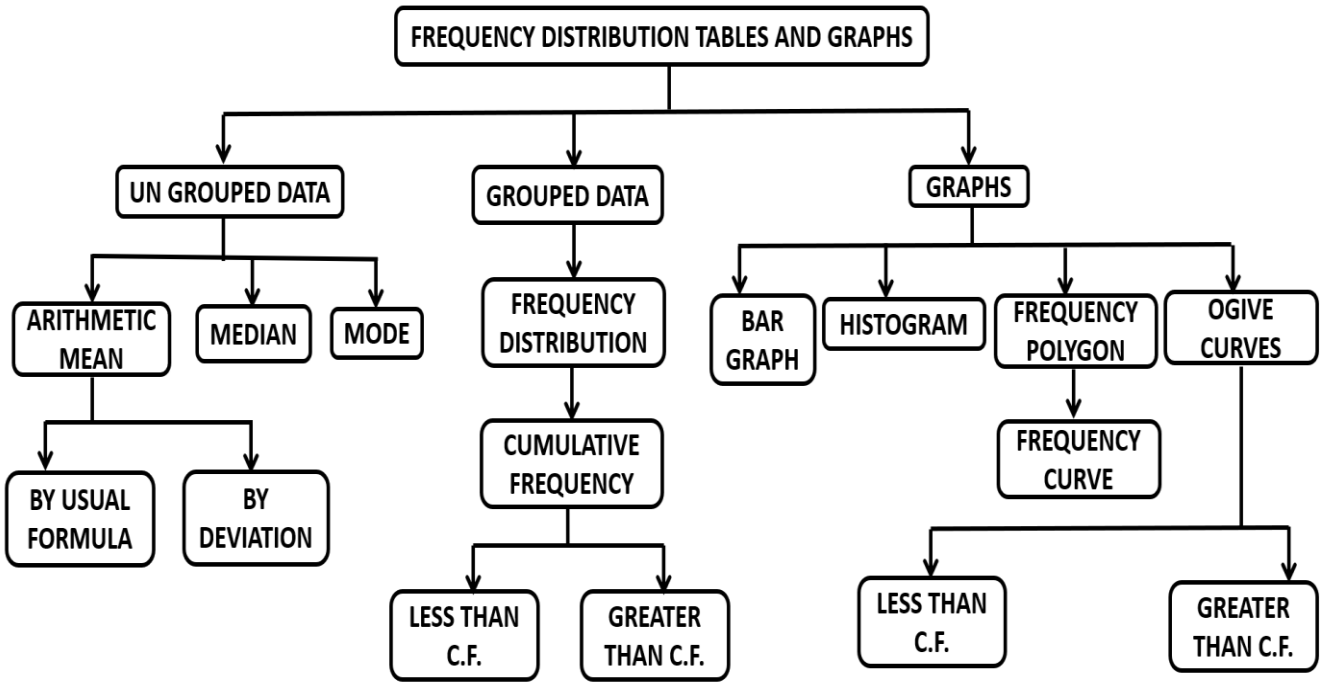
Data, average, maximum and minimum values, arithmetic mean, median and mode, bar graph.

Number of allotted periods: 16 periods.

Unit/Lesson	Sub-topics	Teaching periods	Remarks
Frequency distribution tables and graphs.	1. Introduction of Data and Basic measures of central tendencies.	1	
	2. Arithmetic men by deviation method.	2	
	3. Median and Mode	2	
	4. Organization of grouped data, limits and boundaries.	1	
	5. Construction of grouped frequency distribution and their characteristics and cumulative frequency.	2	
	6. Graphical representation of data bar graph and histogram.	2	

	7. Construction of histogram and histogram for grouped frequency distribution with class marks.	2	
	8.Construction of frequency polygon for a grouped frequency distribution without using histogram.	2	
	9. Graphs of less than and greater than cumulative frequency curves.	2	
	TOTAL	**16**	

Concept Map:



Required TLM: Charts, colour papers, graph papers

ICT TOOLS: IFP, GeoGebra, DIKSHA App, Khan academy.

TEACHER'S REFERENCE:

TEACHER'S REFLECTIONS:

8. EXPLORING GEOMETRICAL FIGURES

CLASS: VIII

NAME OF THE UNIT: 8. Exploring Geometrical Figures.

Learning Outcomes: The learner

- Identifies congruent, similar figures from the given geometrical shapes.
- Give examples for similar and congruent figures.
- Explains the reasons for the statement: Two congruent triangles are similar but two similar triangles are not congruent.
- Explains and identify similar figures based on ratio of corresponding sides and corresponding angles.
- Solves problems related to heights of mountains, height of buildings, heights of towers based on the ratio of corresponding sides.
- Explains the changes in figures while rotation, motion and flip.
- Connects the concept of symmetry to English alphabets.
- Connects the concepts of similar, congruent and symmetrical figures in day-to-day life objects.
- Express the relation between the number of sides of a regular polygon and the order of rotational symmetry.
- Explains point symmetry, line symmetry and rotational symmetry based on shapes of geometrical figures.
- Express dilation and tessellation terms in their own words.
- Constructs similar, congruent and symmetrical figures.
- Constructs dilation on a graph paper for the given measurements.

Prerequisites: Students must know the following:

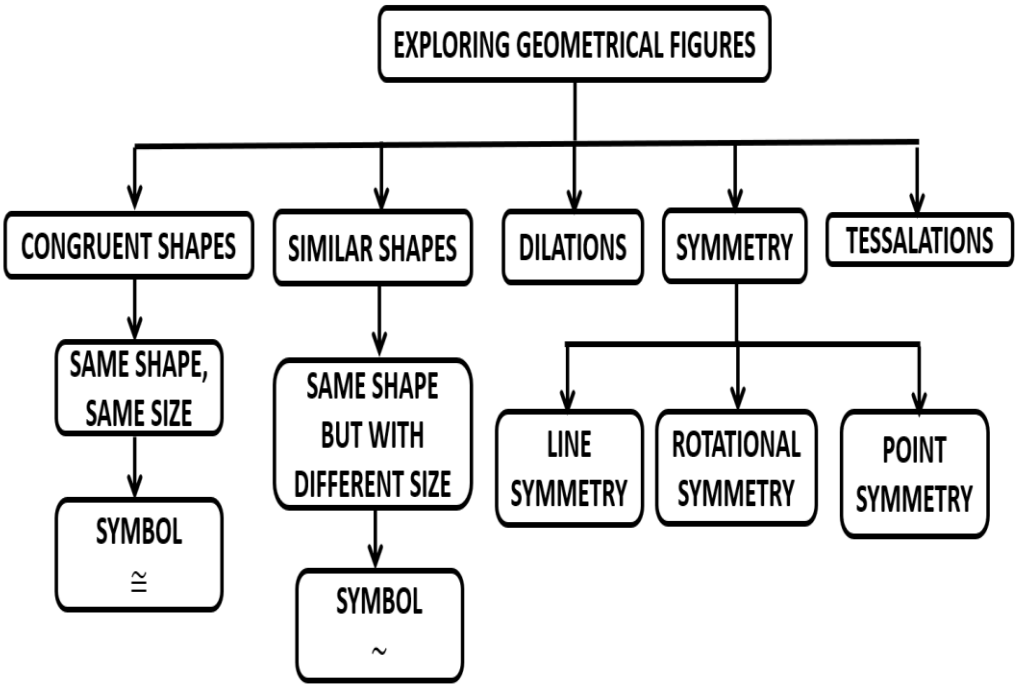
Triangles, squares, rectangle, circles, similar and congruent figures, symmetry, regular polygon, English alphabets.

Number of allotted periods: 9 periods .

Unit/Lesson	Sub-topics	Teaching periods	Remarks
8. Exploring Geometrical Figures.	1. Introduction of congruent shapes, similar shapes, symmetric shapes.	1	
	2. Application of similarity.	2	

	3. Constructing a dilation.	2	
	4. Types of Symmetry.	2	
	5. Applications of Symmetry.	2	
	TOTAL	**9**	

Concept Map:



Required TLM: Charts, colour papers, graph papers,

ICT TOOLS: IFP, GeoGebra, DIKSHA App, Khan academy.

TEACHER'S REFERENCE:

TEACHER'S REFLECTIONS:

9. AREA OF PLANE FIGURES

CLASS: VIII

NAME OF THE UNIT: 9. Area of Plane Figures

Learning Outcomes: The learner

- Read and write formulae for the areas of quadrilaterals, triangles, circles, circular path and sector.
- Solves problems related to areas of quadrilaterals, triangles, circles, circular path, and sector.
- Converts irregular field shapes into known regular geometrical shapes.
- Represents data of verbal problems through suitable figures.
- Explains the relation between the length of the arc and angle subtended by the arc of sector.
- Connects the concepts of quadrilaterals, triangles, circles, circular paths and sectors in daily life activities.
- Represents different shapes on graph paper.
- Connects the concepts of different geometrical shapes to co-ordinate geometry and algebraic concepts.

Prerequisites: Students must know the following:

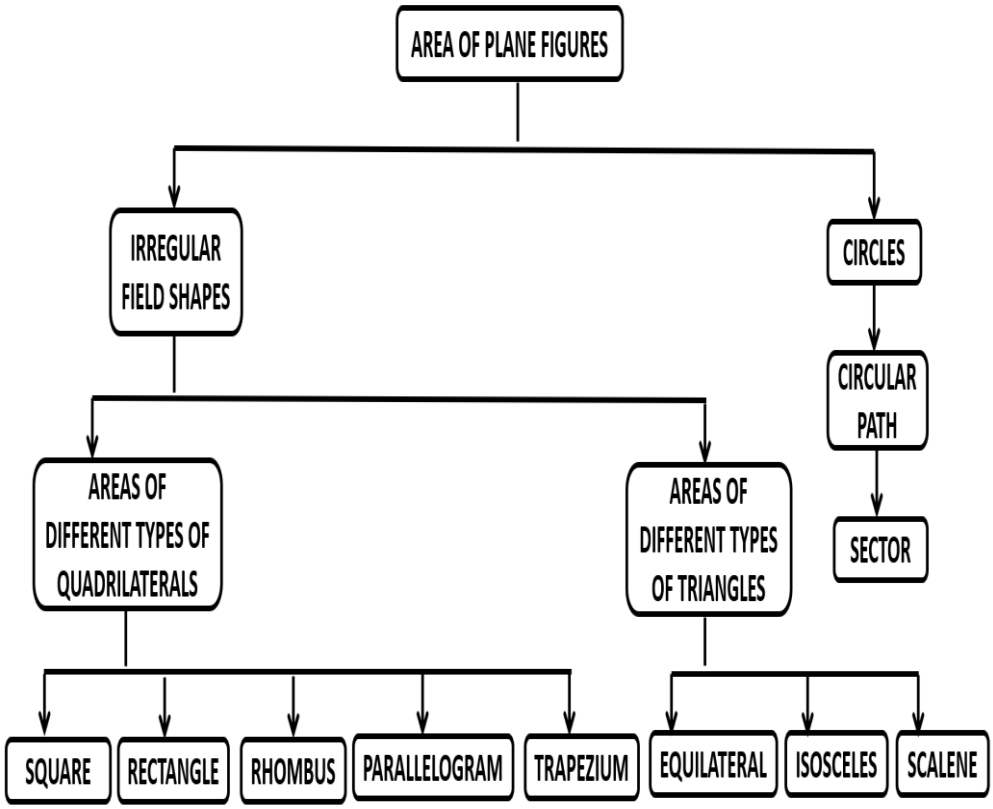
Types of triangles, types of quadrilaterals, circle, length of the arc, sector, rectangular path, square path and their formulae for areas.

Number of allotted periods: 16 periods.

Unit/Lesson	Sub-topics	Teaching periods	Remarks
Area of Plane Figures.	1. Introduction of area of plane figures and formulae.	1	
	2. Area of trapezium.	2	
	3. Area of quadrilateral.	2	
	4. Area of rhombus.	2	
	5. Area of a polygon.	2	
	6. Area of circle	2	

	7. Area of a circular path or area of a ring	2	
	8. Length of the arc and area of sector.	3	
	TOTAL	**16**	

Concept Map:



Required TLM:

Charts, colour papers, graph papers

ICT TOOLS: IFP, GeoGebra, DIKSHA App, Khan academy.

TEACHER'S REFERENCE:

TEACHR'S REFLECTIONS:

10. DIRECT AND INVERSE PROPORTIONS

CLASS: VIII

NAME OF THE UNIT: 10. Direct and Inverse Proportions

Learning Outcomes: The learner

- Explains reasons for the change of one quantity leads to change in another quantity.
- Understands the concepts of direct, inverse and compound proportions.
- Solves problems related to direct, inverse and compound proportions.
- Expresses direct, inverse and compound proportions with suitable situations.
- Connects problems of proportions to ratios.
- Constructs and explains squares for different measurements and observes the relation between proportion of length of a side of a square and its area.
- Visualize data of proportion through tabular forms.
- Connects problems of proportions to real life situations.

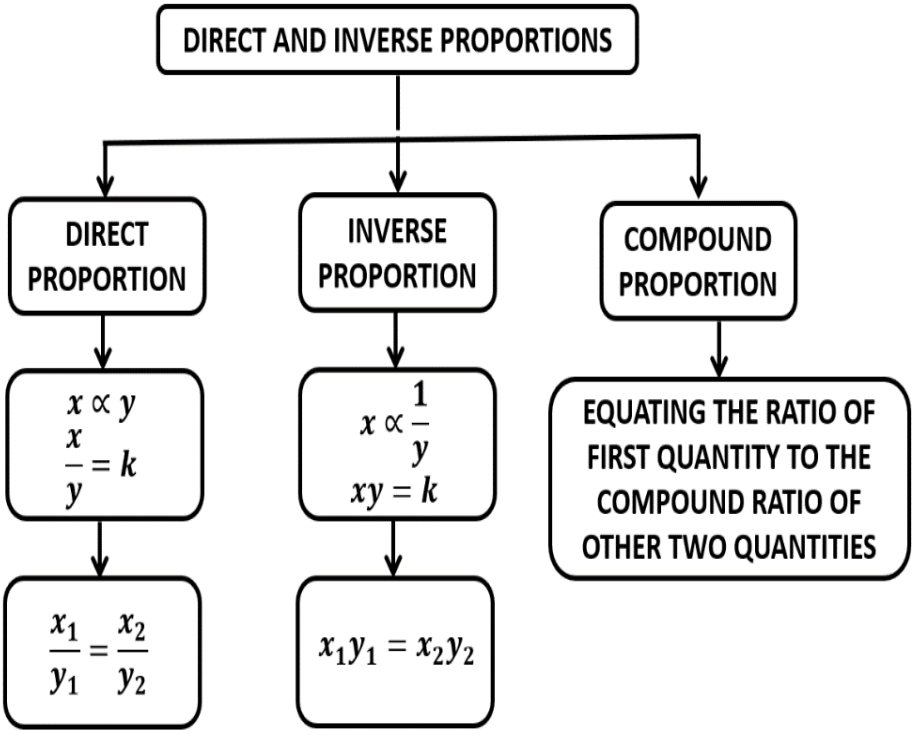
Prerequisites: Students must know the following:

Area of square, quantities, ratio, proportion, variables, direct proportion, inverse proportion.

Number of allotted periods: 10 periods.

Unit/Lesson	Sub-topics	Teaching periods	Practice periods
Direct and Inverse Proportions	1. Introduction of Direct and inverse proportions	1	
	2. Direct proportion	3	
	3. Inverse Proportion	3	
	4. Compound proportion	3	
	TOTAL	**10**	

Concept Map:



Required TLM: Charts, colour papers, graph papers

ICT TOOLS: IFP, GeoGebra, DIKSHA App, Khan academy.

TEACHER's REFERENCE:

TEACHER'S REFLECTIONS:

11. ALGEBRAIC EXPRESSIONS

CLASS: VIII

NAME OF THE UNIT: 11. Algebraic Expressions.

Learning Outcomes: The learner

- Explains the terms like degree, constant, variable and coefficient.
- Explains the difference between numerical and algebraic expressions.
- Expresses like terms and unlike terms.
- Solves Problems related to algebraic addition, subtraction and multiplication.
- Explains reasons for finding product of algebraic expressions through identities.
- Represents product of algebraic expressions in tabular forms.
- Solves the problems by using suitable identities.
- Explains and verifies algebraic identities in geometric methods.
- Connects the algebraic expressions to time and work, time and distance and principles of Interest - time.
- Explains and simplifies the like terms in algebraic addition and subtraction.
- Explains the terms in the result after multiplication of monomial, binomial and polynomial.

Prerequisites: Students must know the following:

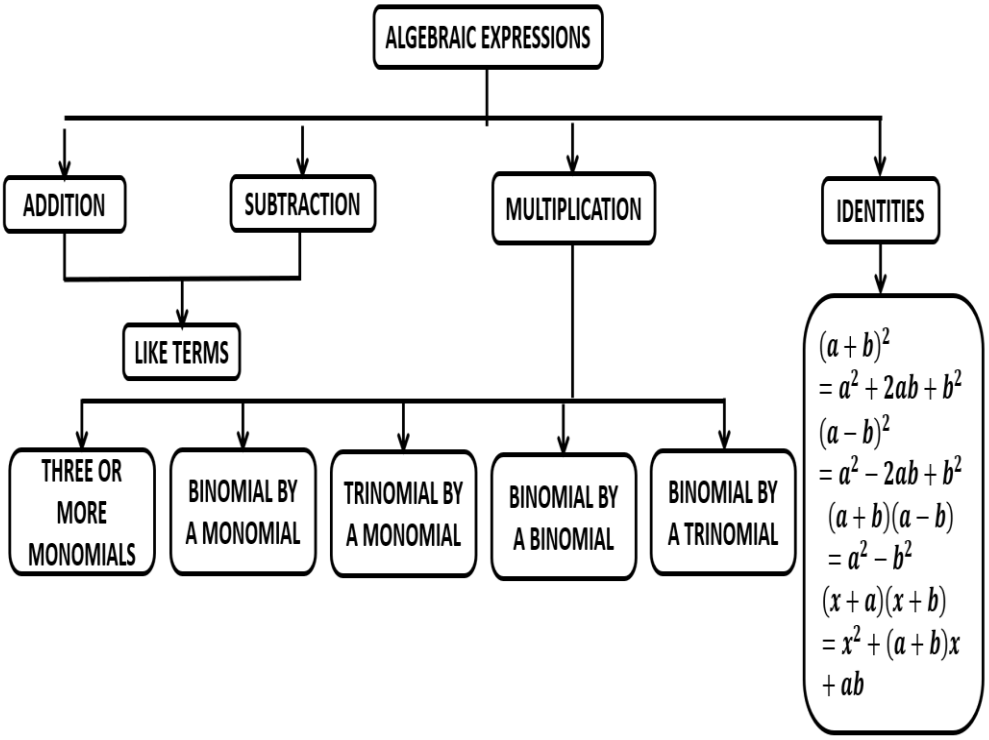
Like terms, unlike terms, monomial, binomial, trinomial, multinomial, polynomial, variables, degree, constant terms, co-efficient, addition, subtraction and multiplication of algebraic expressions.

Number of allotted periods: 17 periods.

Unit/Lesson	Sub-topics	Teaching periods	Remarks
Algebraic Expressions.	1.Introduction of Algebraic expression, like terms and unlike terms.	1	
	2. Addition and subtraction of algebraic expressions.	2	
	3. Multiplication of algebraic expressions. (i) Multiplying a monomial by a monomial (ii) Multiplying three or more monomials	2	
	4. (iii) Multiplying a binomial or a trinomial by a monomial.	2	

	(iv) Multiplying a binomial by a binomial or trinomial.		
	5. What is an identity? Some important identities.	2	
	6. Application of identities.	4	
	7. Geometrical interpretation of the identities.	3	
	TOTAL	**16**	

Concept Map:



Required TLM: Charts, colour papers, graph papers

ICT TOOLS: IFP, GeoGebra, DIKSHA App, Khan academy.

TEACHR'S REFERNCE:

TEACHER'S REFLECTIONS:

12. FACTORIZATION

CLASS: VIII

NAME OF THE UNIT: 12. Factorization

Learning Outcomes: The learner

- Express the given numbers in the form of product of prime factors.
- Understands the factorization and division of algebraic expressions.
- Divides an algebraic expression by another algebraic expression.
- Solves problems on factorization of algebraic expressions.
- Solves daily life problems using algebraic expressions.
- Justifies the correctness of mathematical sentences.

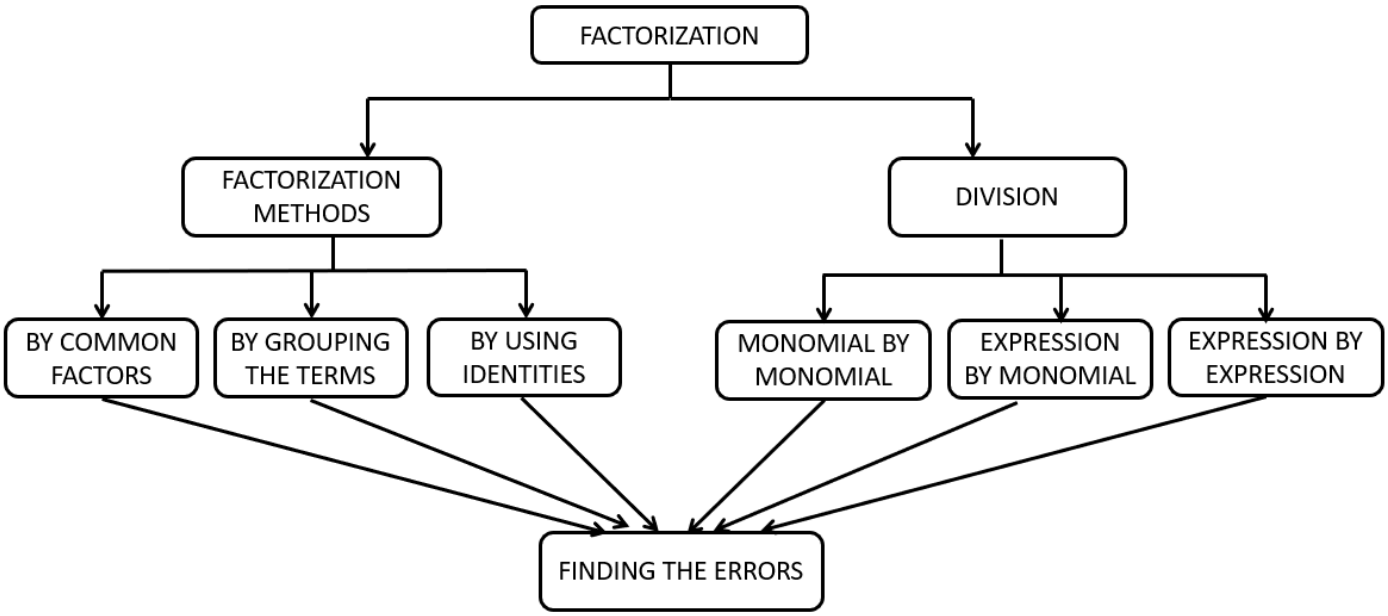
Prerequisites: Students must know the following:

Natural numbers, whole numbers, integers, Prime and composite numbers, factors and common factors, Prime factorization, operations on integers, distributive property and types of algebraic expressions. Division is the inverse process of multiplication.

Number of allotted periods: 12 periods .

Unit/Lesson	Sub-topics	Teaching periods	Remarks
Factorization	1. Prerequisites and key concepts.	1	
	2. Introduction and factorization of algebraic expressions.	3	
	3. Factorization using identities. Factors of the form $(x + a)(x + b)$	2	
	4. Division of monomial by monomial and division of an expression by monomial.	2	
	5. Division of an expression by an expression.	2	
	6. Finding the errors in given statements and correction of them.	2	
	TOTAL	**12**	

Concept Map:



Required TLM: Charts, colour papers, graph papers

ICT TOOLS: IFP, GeoGebra, DIKSHA App, Khan academy.

TEACHER'S REFERENCE:

TEACHER'S REFLECTIONS:

13. VISUALISING 3-D IN 2-D

CLASS: VIII

NAME OF THE UNIT: 13. Visualising 3-D in 2-D

Learning Outcomes: The learner

- Read and write the names of 2-D and 3-D figures.
- Explains the difference between 2-D and 3-D figures.
- Explains the difference between actual 3-D objects and the 3-D objects drawn on isometric sheet.
- Express the terms like plane, vertex, edge, polyhedron, non-polyhedron in his own words.
- Explains polyhedron and non-polyhedron 3-D objects and verify the Euler Theorem for 3-D objects.
- Connects different polyhedron and non-polyhedron objects to their names.
- Represents 3-D shapes on graph papers and on isometric dot sheets.
- Constructs different 3-D shapes by using different unit cubes.
- Represents 3-D shapes by using net diagrams.

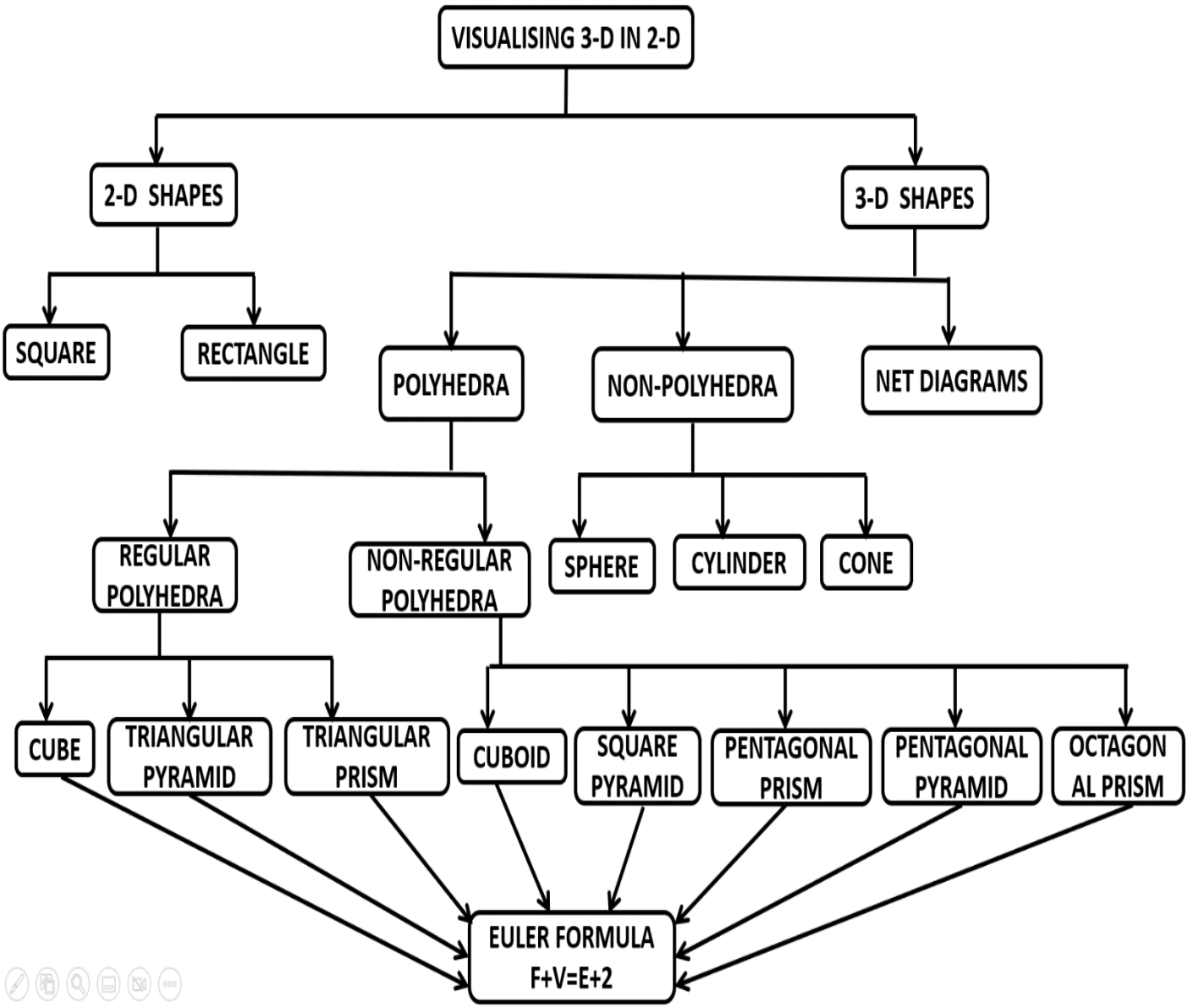
Prerequisites: Students must know the following:

2-D shapes and 3-D shapes, faces, edges, vertices, drawing 2-D and 3-D shapes on isometric dot sheets, nets of 3-D shapes.

Number of allotted periods: 9 periods.

Unit/Lesson	**Sub-topics**	**Teaching periods**	**Remarks**
Visualizing 3-D in 2-D	1.Introduction of 2-D and 3-D shapes	1	
	2. Representation of 3-D figures on 2-D and various geometrical solids	2	
	3. Faces, edges and vertices of 3-D objects.	2	
	4. Number of edges, faces and vertices of polyhedrons and Euler's formula	2	
	5. Net diagrams	2	
	TOTAL	**9**	

Concept Map:



Required TLM: Charts, colour papers, graph papers

ICT TOOLS: IFP, GeoGebra, DIKSHA App, Khan academy.

TEACHER'S REFERENCE:

TEACHER'S REFELCTIONS:

14. SURFACE AREAS AND VOLUMES

CLASS: VIII

NAME OF THE UNIT: 14. Surface areas and Volumes

Learning Outcomes: The learner

- Read and write the formulae of lateral surface area, total surface area, volume of cube and cuboid.
- Solves the problems related to lateral surface area, total surface area, volumes of cube and cuboids.
- Explains how to find the lateral surface area, total surface area of cube based on net diagrams.
- Explains the difference between lateral surface area and total surface area.
- Express how to measure the volumes of liquids in milliliters and liters.
- Express names of different shapes by arranging different unit cubes.
- Connects shapes of cube and cuboids into the real-life situations.
- Represents cube and cuboids through net diagrams.
- Visualise the areas and volumes of cubes by constructions.

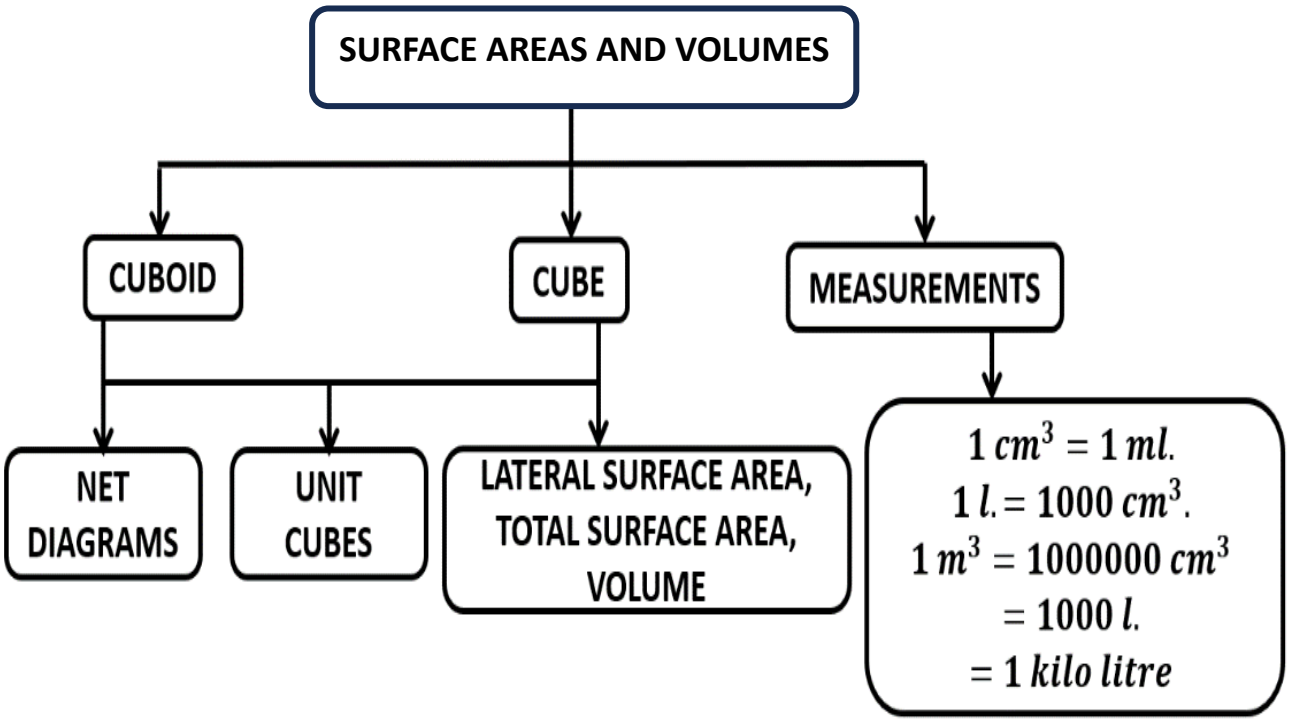
Prerequisites: Students must know the following:

Cube, cuboid. faces, edges, vertices, net diagrams.

Number of allotted periods: 10 periods.

Unit/Lesson	Sub-topics	Teaching periods	Remarks
14. Surface areas and volumes.	1.Introduction of cube and cuboid	1	
	2. Lateral surface area and total surface area of a cuboid.	3	
	3. Lateral surface area and total surface area of a cube.	2	
	4. Volume of a cube.	2	
	5. Volume of a cuboid	2	
	TOTAL	**10**	

Concept Map:



Required TLM: Charts, colour papers, graph papers

ICT TOOLS: IFP, GeoGebra, DIKSHA App, Khan academy.

TEACHER'S REFERENCE:

TEACHER'S REFELCTIONS:

15. PLAYING WITH NUMBERS

CLASS: VIII

NAME OF THE UNIT: 15. Playing with Numbers.

Learning Outcomes: The learner

- Express place value of the given numbers.
- Express the given number in expanded form.
- Explains different divisibility rules.
- Solves problems using divisibility rules of different numbers.
- Solves problems related to finding factors and multiples of a given number.
- Solves problems related to missing place values in the given numbers.
- Explains the differences of divisibility rules of 7 – for smaller and larger numbers.
- Solves problems related to finding the sum of first 'n' natural numbers.

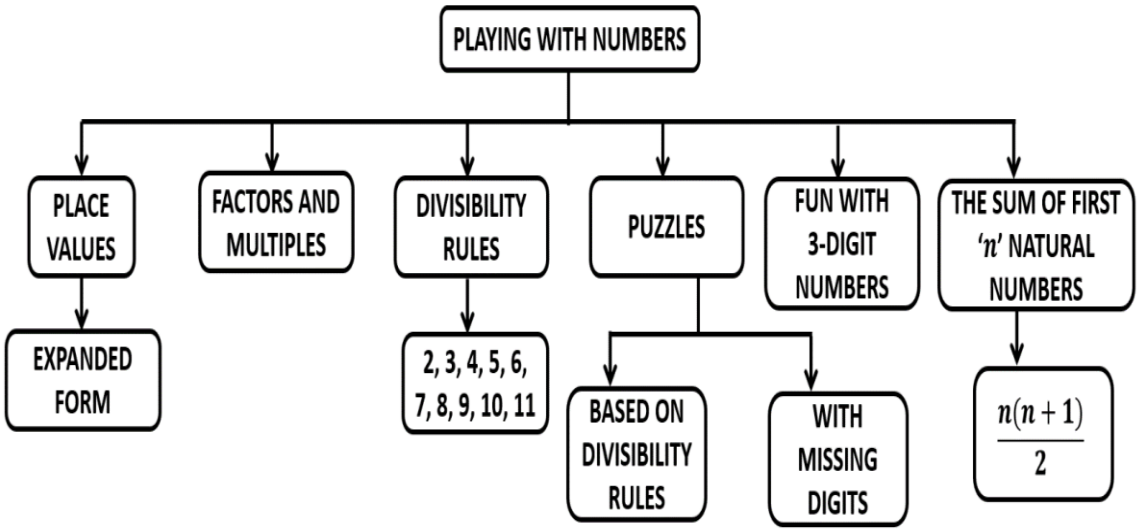
Prerequisites: Students must know the following:

Natural numbers, place values, digits, expanded form, sum, difference, smaller and larger numbers, multiples, factors, divisibility rules.

Number of allotted periods: 23 periods.

Unit/Lesson	Sub-topics	Teaching periods	Remarks
Playing with Numbers.	1.Prerequisites and Introduction of numbers and place values.	1	
	2. Expanded form of numbers, factors and multiples.	2	
	3. Divisibility by 10 and 5.	2	
	4. Divisibility by 2, 3, 6 and 9.	2	
	5. Divisibility by 4 and 8.	2	
	6. Divisibility by 7 and 11.	2	
	7. Divisibility by 7 for large numbers.	2	
	8. Puzzles based on divisibility rules and fun with 3-digit numbers.	2	
	9. Puzzles with missing digits.	2	
	10. Finding of divisibility by taking remainder of place values.	2	
	11. Some more puzzles on divisibility rules	2	
	12. Finding sum of consecutive numbers.	2	
	TOTAL	**23**	

Concept Map:



Required TLM: Charts, colour papers, graph papers

ICT TOOLS: IFP, GeoGebra, DIKSHA App, Khan academy.

TEACHER'S REFERENCE:

TEACHER'S REFLECTIONS: