

Class 7th

Topic :Integers

PK Testing

1. Define whole numbers.
2. How many integers lie between -3 and 3
3. The successor of -19 is ____

Objectives

At the end of the lesson students will be able to

1. **Cognitive:**Define what is an integer and the rules involving operations on integers
2. **Psychomotor:** Solve problems involving operations on integers
3. **Effective:**Applying integers in Real world application .

Vocabulary and important spellings

Positive words: Deposit, increases, forward, ascending, gained, above

Negative words: Withdrawal, decrease, backward, descending, loss, below

Closure, commutative, associative, include.

Aids

1. Black Board
2. PPT

Innovative methods used to explain the Topic

Art Integration

Song

Same sign keep and Add

Different sign subtract

Keep the sign of bigger Number

Then answer will be Exact.

Teacher will also explain them the method to add and subtract integers on number line and also tell them the rules to multiply and divide the integers that is product of the even numbers of the negative integers is positive the product of the odd numbers of negative integers will be negative after this teacher will explain them a game given in the book page number 12, 13.

Co scholastic activity

GAME

1. Take a Board marks from -104 to 104 as shown
2. Take a bag containing two blue and two red dice.
3. Number of dots on the blue dice indicate positive integers and the number of dots on the red dice indicate negative integers.
4. Every player will place his or her counter at zero .
5. Each player will take out to dice at a time from the bag and through them .
6. After every through the player has to multiply the number marked on the dice.
7. If the product is a positive integer then the players will move his counter toward 104
8. If the product is a negative integers then the player will move counter toward -104
9. The players who reaches either- 104 or 104 first is the Winner.

104	103	102	101	100	99	98	97	96	95	94
83	84	85	86	87	88	89	90	91	92	93
82	81	80	79	78	77	76	75	74	73	72
61	62	63	64	65	66	67	68	69	70	71
60	59	58	57	56	55	54	53	52	51	50
39	40	41	42	43	44	45	46	47	48	49
38	37	36	35	34	33	32	31	30	29	28
17	18	19	20	21	22	23	24	25	26	27
16	15	14	13	12	11	10	9	8	7	6
-5	-4	-3	-2	-1	0	1	2	3	4	5
-6	-7	-8	-9	-10	-11	-12	-13	-14	-15	-16
-27	-26	-25	-24	-23	-22	-21	-20	-19	-18	-17
-28	-29	-30	-31	-32	-33	-34	-35	-36	-37	-38
-49	-48	-47	-46	-45	-44	-43	-42	-41	-40	-39
-50	-51	-52	-53	-54	-55	-56	-57	-58	-59	-60
-71	-70	-69	-68	-67	-66	-65	-64	-63	-62	-61
-72	-73	-74	-75	-76	-77	-78	-79	-80	-81	-82
-93	-92	-91	-90	-89	-88	-87	-86	-85	-84	-83
-94	-95	-96	-97	-98	-99	-100	-101	-102	-103	-104

Procedure

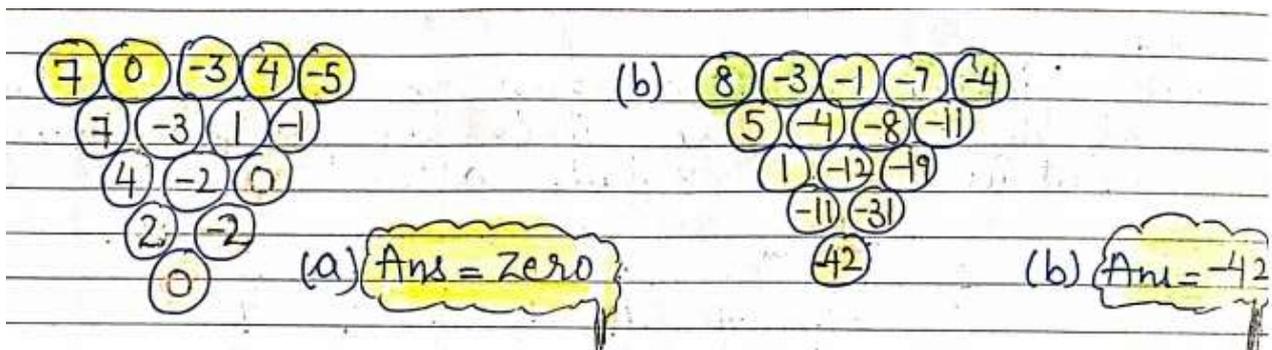
The teacher will introduce the topic with the definition of integers that is positive and negative numbers along with zero are called integers. positive numbers lie on the right hand side of zero on the number line and the negative integers lie on the left hand side of the number line teacher will explain same topic with the help of the black board

Properties

1. **Closure Property:** If a & b are integers then $a + b$, $a - b$, $a \times b$ are again integers.
2. **Commutative Property:**
 $a + b = b + a$
 $a \times b = b \times a$
3. **Associative Property:** $(a + b) + c = a + (b + c)$
4. **Distributive Property:** $a \times (b + c) = (a \times b) + (a \times c)$

Innovative Pedagogies

To check the concept of addition and subtraction teacher will give them a worksheet based upon matching teacher will and carry the students to solve this activity and sums given in the book bracket NCERT.



Recapitulation

Solve the following

- (1) $-8 + 15 =$ _____
- (2) $-7 - 6 =$ _____
- (3) $-1 \times -2 \times -3 \times 4 \times 5 =$ _____
- (4) 2 exceed $-3 =$ _____

Learning outcomes

Students will be able to

1. Define the set of integers, positive numbers, negative numbers, opposite.
2. List real life situations involving opposite.
3. Identify an integer to represent a given real life situation.
4. Indicate an integer on a number line.

Resources

1. NCERT Book
2. Worksheet Books(EduHub Publications)
3. PPT.

Class 7th

Topic :Factions and decimals

PK Testing

4. Draw a fraction which represent half.
5. How can we write three fourth?
6. How can we write hundredths?
7. Write the decimal form of two upon thousand .

Objectives

After this lesson students will be able to

1. Identify the types of fractions
2. Able to compare fractions and decimals
3. Represent fractions on number line .
4. Add,subtract, multiply and divide fractions and decimals.
5. Use fraction and decimals in daily life.

Vocabulary and important spellings

Fraction, Numerator, Denominator, Proper, Improper, Equivalent, etc.

Aids

1. Black Board
2. Coloured Pens
3. Sketch Pen

Innovative methods used to explain the Topic

Paper folding method will be used. Teacher will cut a circle of any radius on a drawing sheet and divide this into four equal parts by paper folding method and shade 1 part out of 4 with any colour and tell them about concept of 1 by 2, 1 by 4.

Art Integration

Fraction Rangoli or Patterns

Teacher will encourage students to create a pattern with different coloured papers by cutting them into 1 by 4, 1 by 2, 1 by 8 of the original size of paper.

After this she will engage students in discussion about any nicknames they may have and ask the students if calling someone by nickname changed the person and she will relate fractions to decimals by making a comparison to the nicknames and explain them that fraction and decimal are different names for the same value example

1 by 10 is equal to 0.1

$$1 / 10 + 1 / 10 = 2 / 10$$

$$= 0.2$$

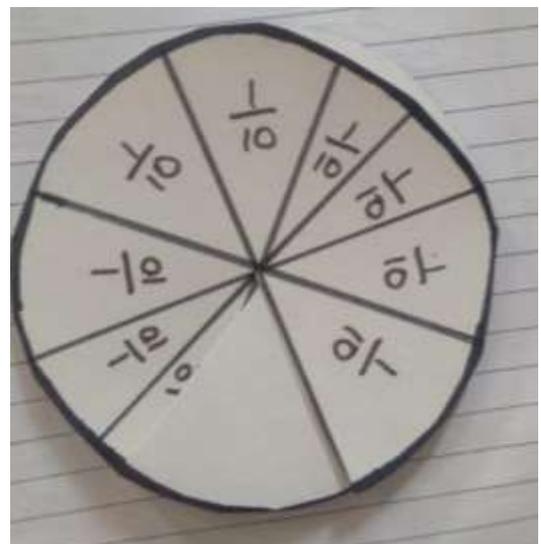
She will explain the concept by means of an activity she will call two students and say them to cut two circles of 10 cm radii each. students will divide the Circus into 10 equal parts and instruct them to write 1 by 10 on each part of the circle and 0.1 on each part of another circle when they interlock both the circles as shown then they will come to know about the relationship between fractions and decimals that is

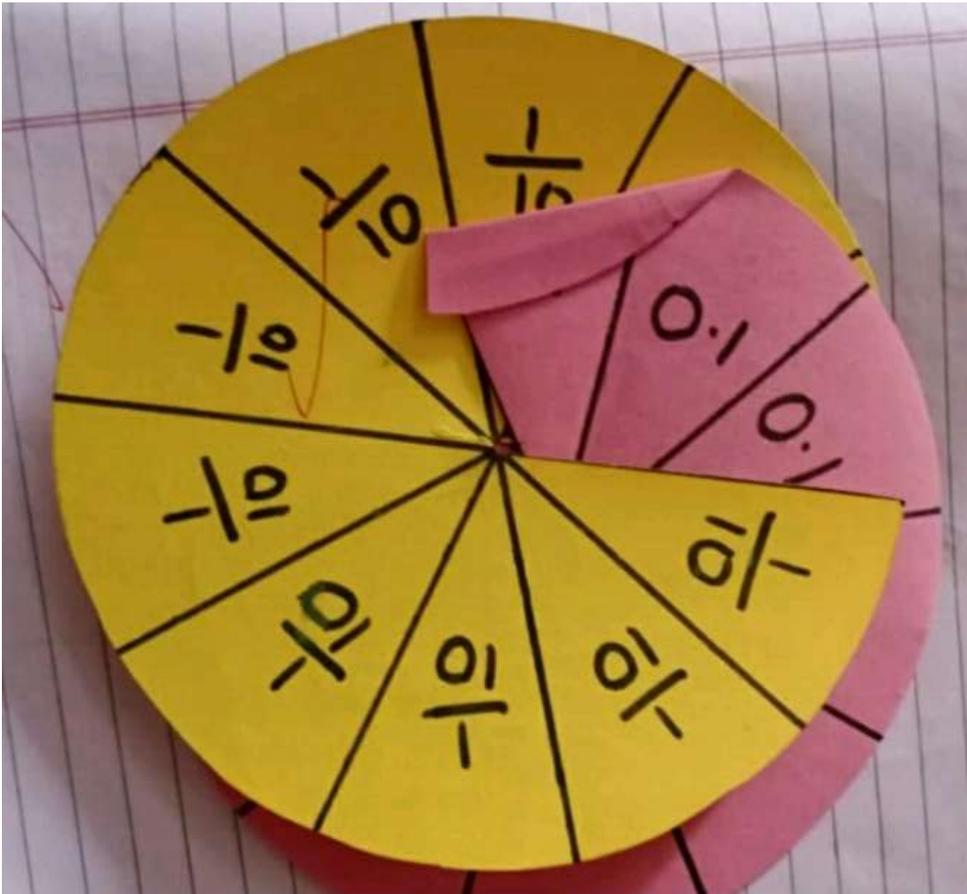
$$1/10 + 1/10 + 1/10 + 1/10 + 1/10 = 5 / 10$$

$$= 0.5$$

$$0.1 + 0.1 + 0.1 + 0.1 + 0.1$$

$$= 0.5$$





Procedure

Fraction is a part of a whole.

Fraction = Numerator

Denominator

It has many types improper fraction,proper fraction,mixed fraction, like fraction,unlike fraction,equivalent fractions. addition and subtraction of like fractions. To add or subtract two like fractions we add or subtract numerators and denominator will remain the same.

To add or subtract unlike fractions convert them into like and then add or subtract. Multiplication and division of fractions will be explained with the help of examples and activities. With the help of place value chart reading and writing of decimals will be explained content will be shown on the black board also method to write the place value expanded form multiplication and division of decimals will be explained

Maths Lab Activity-1

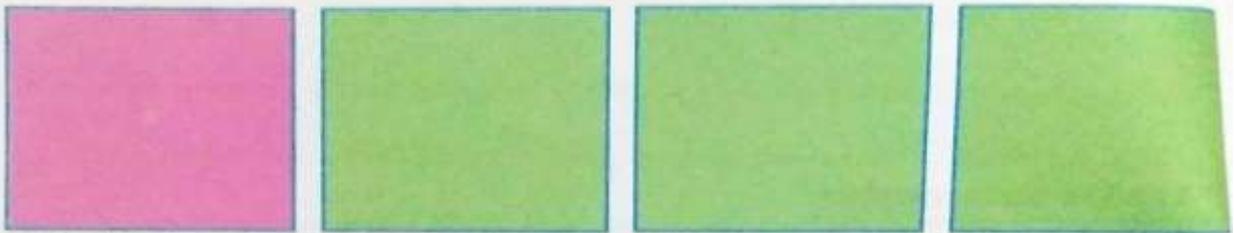
Objective : Multiplying a fraction and a whole number.

Materials Required : Some thick sheets of paper, sketch pen, scissors, pen, pencil, etc.

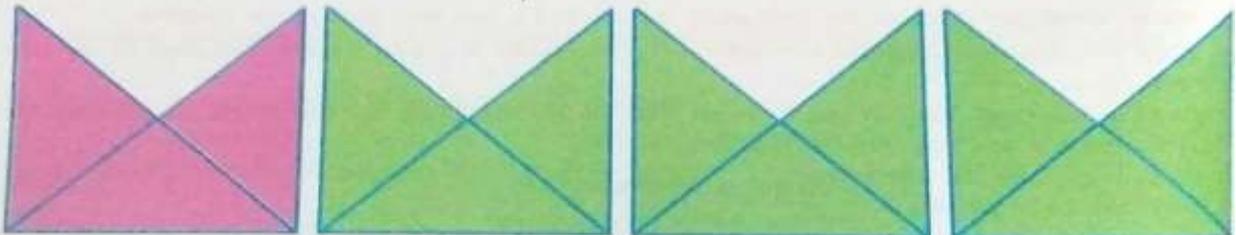
I. To find $4 \times \frac{3}{4}$

Procedure :

1. On a thick sheet of paper, draw 4 congruent squares. Using scissors, cut out these square pieces.



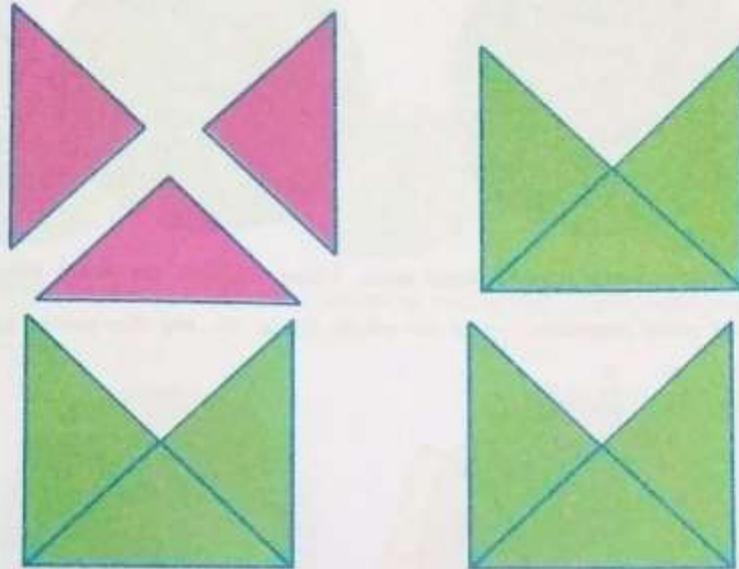
2. Join the opposite vertices of each square to get the diagonals of the squares. The diagonals of each square divide the square into 4 equal parts. Using scissors, cut out one part of each square. Each remaining piece represents $\frac{3}{4}$ of the whole square.



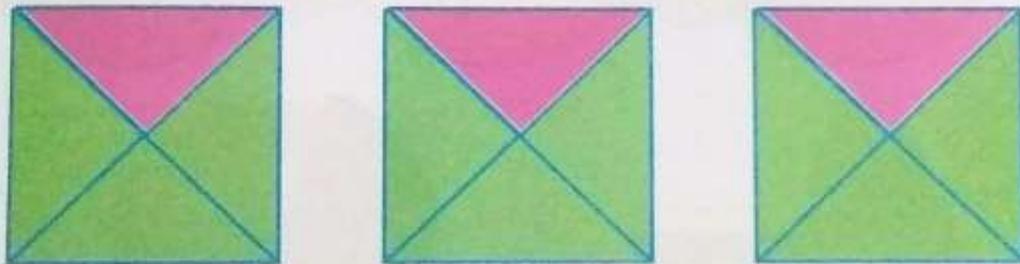
3. We know that multiplication is repeated addition of the same number. So, the four pieces shown above represent,

$$\frac{3}{4} + \frac{3}{4} + \frac{3}{4} + \frac{3}{4} = 4 \times \frac{3}{4}$$

4. Take one of the pieces and using scissors, cut it out into three equal parts. Leave the remaining three pieces as such.



5. Now, rearrange the six pieces to get three complete squares as shown below.



Thus, $4 \times \frac{3}{4} = 3$

Participation of students

CO-SCHOLASTIC ACTIVITY:-

Participation of students - To check concept of fraction by giving them an activity . 8 parts and fill the answers in the given table .

R	O	O	Y			
R	O	O	Y			
R	O	O	Y			
R	O	O	Y			
R	O	O				
R	O	O				
R	O	Y				
R	O	Y				
R	O	Y				
R	O	Y				

R - RED COLOUR O - ORANGE Y - YELLOW

Teacher will encourage the students to solve this activity.

COLOUR	FRACTION	LOWEST
RED	10/100	1/10
ORANGE	16/100	4/25
YELLOW	8/100	2/25
RED + ORANGE	10/100 + 8/100 = 18/100	9/50

Teacher will encourage the students to solve the sums given in the exercises of NCERT book and assignments given in the worksheet book.

Recapitulation

1. Convert the following into mixed fractions $37/5$, $77/8$.
2. Arrange in ascending and descending order $5/12$, $3/4$, $7/8$, $3/24$
3. Subtract $7/9$ from $15/8$
4. Add 19.8, 7.26, 0.074, 2.37
5. Find the product 4.26×0.08 and 32.5×1000
6. Divide 0.068 by 0.04 and $30.25/100$

Learning Outcomes

The students will be able to define decimal, mixed number, whole number, fraction, place value, add, sub, multiply and divide fractions and decimals. Identify the whole number and fractional parts of a decimal. Identify the purpose of using decimals. Recognise connection between decimal numbers and place value.

Resources

4. NCERT Book
5. Worksheet Books (Edu Hub Publications)
6. PPT.

Class 7th

Topic : Data Handling

PK Testing

8. Define data .
9. How can we calculate the mean of the given data ?

Objectives

Students will be able to collect record and interpret data. They will learn to construct bar graph ,double bar graph, pictograph ,mean, median, mode and range of the given data.

Vocabulary and important spellings

Interpret, data, x axis, y axis, categories, origin probability ,average ,mean, horizontal Axis, vertical axis etc.

Aids

4. Black Board Playing Cards
5. Graph
6. Coin
7. Dice

Innovative methods used to explain the Topic

Art Integration

Poem

Hey diddle diddle,
The median is in the middle ,
You add and divide for the mean,
The mode is the one that appears the most,
And the range is the difference between.

Procedure Teacher will explain the students about the method to find mean median and mode and range.

1. Average : is the number that represents or shows the central tendency of a group of observations or data
2. Mean : sum of all observations divided by number of observations
3. Mode : the mode of set of observation is the observation that occurs most often
4. Median : it refers to the value which lies in the middle of the data(arrange the data in the ascending order)
5. Range : the difference between the highest and lowest observation

Example

Find the mean median mode and range of the following data 39, 32, 41, 28, 54, 35, 26, 23, 33, 39

Ascending order 23, 26, 28, 32, 33, 35, 39, 39, 41, 54

$$\begin{aligned}\text{median} &= 33 + 35 / 2 \\ &= 68 \div 2\end{aligned}$$

$$i = 34$$

$$\begin{aligned}\text{Mean} &= \text{sum of observations divided by number of observations is} \\ &= 350 / 10 = 35\end{aligned}$$

$$\text{Mode} = 39$$

$$\text{Range} = 54 - 23 = 31$$

Bar graph

1. The collection of information is called data
2. The data in its original form is called raw data
3. The each item in the raw data is called an observation
4. Putting all these all information on paper is called recording of the data.

Co scholastic activity

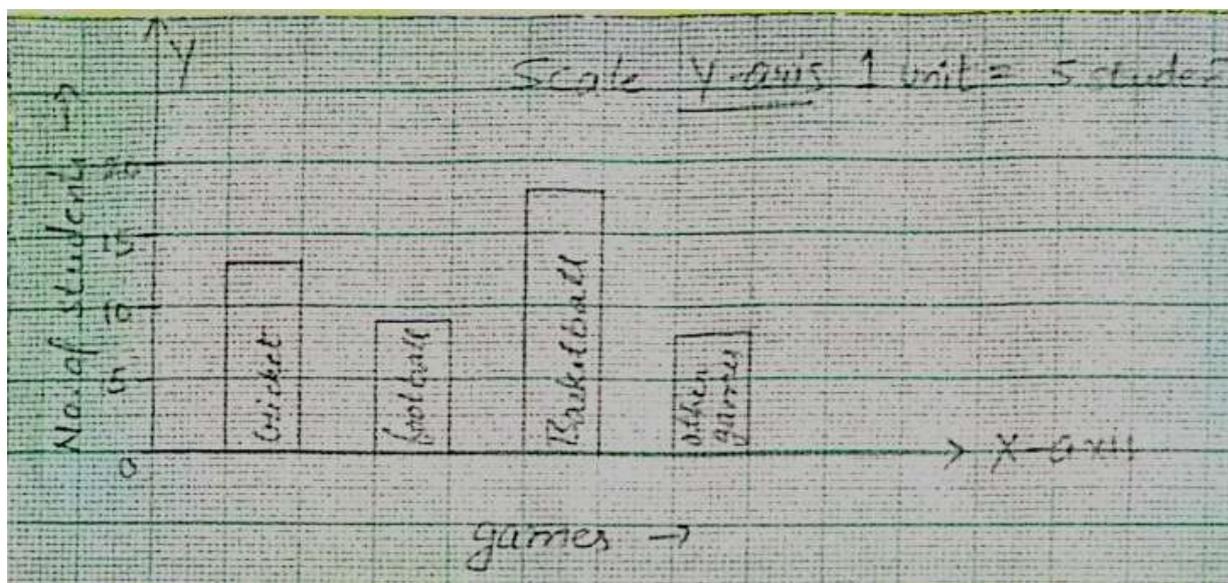
Now teacher ask from the students to tell their favourite games and mark tick () in the following table under the respective game games .cricket, football, basketball, other games

Number of students _____

Teacher circulates above table in class every student will put tick sign against the game of choice the teacher would then have to count all tick signs placed against every game then she will use Tally marks to count them

game	Tally marks	No. of students
Cricket	THH THH III	= 13
Football	THH IIII	= 9
Basketball	THH THH THH III	= 18
other games	THH III	= 8

After this teacher will explain the method to draw the bar graph for this collected data .



At the last teacher will ask the following questions from the students

1. Which is the most favourite game?
2. Which game is least liked by the students?

Probability there are situations in our life that are certain to happen some are impossible and some may or may not happen the situation may or may not happen as a chance of happening probability of an event is equal to number of favourable outcomes divided by total number of outcomes.

To make the concept more clear visual AIDS will be shown.

Innovative Pedagogies

Teacher will take cards with different numbers and call his student to take out 5 cards and she will tell to the whole class to find out the mean median and mode of the selected numbers selected cards are 2,5 ,9 ,9 and 10



$$\begin{aligned}\text{mean} &= (2 + 5 + 9 + 9 + 10) / 5 \\ &= 35 / 5 \\ &= 7\end{aligned}$$

ascending order 2,5,9,9

median=9

mode = 9

range = maximum value - minimum value

=10 - 2

=8

Teacher will encourage the students to do this activity and solve different sums given in the textbook assignment students will be asked to complete the assignments given in the worksheet book related to the mean ,median, mode, graphs and probability in the form of true false, fill ups and matchings.

Recapitulation

Find the mean ,median mode and range of the first five prime numbers. A dice is thrown once what is the probability of getting a prime number?

Learning outcomes

Students will be able to design a service symmetrically and display data on the bar graph. They can identify read and interpret range and scale on graphs they will use the database to answer the questions and solve problems .

Resources

7. NCERT Book
8. Worksheet Books(EduHub Publications)
9. PPT.

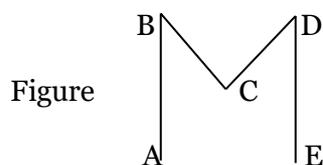
Class VII

Dated

Topic - Lines and Angles

Previous Knowledge Testing:-

- (i) What is a line segment, line and a ray.
- (ii) Identify the different line segments and angle formed in given figure



- (iii) What are acute, obtuse and right angles?

Objectives:-

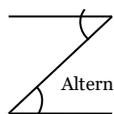
- * To introduce students to the concept of an angle as a rotation and naming an angle.
- * To help students to learn various angle types and the measurement of angles.
- * To help students to recall and deepen their understanding of the concept of parallel and perpendicular lines and horizontal and vertical lines.

Vocabulary used: - Complementary, supplementary adjacent, vertically, transversal, corresponding parallel and alternate.

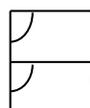
Important Spellings: - Adjacent, corresponding, alternate and parallel.

Aids/Innovative Methods used to explain the topic: -

Teacher will explain the concept of corresponding angles, alternate interior angle and corresponding angle, vertically opposite angle with the help of English alphabets.



Alternate Interior Angle



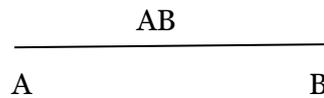
Corresponding Angles



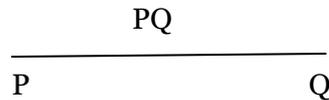
Vertically Opposite Angles.

Procedure: - Teacher will introduce the topic with the help of definition

Line segment: - A line segment has two end points



A line: - A line can be extend the two end points in either direction endlessly



Complementary angles: - When the sum of measures of two angles is 90° , the angles are called complimentary.

Example

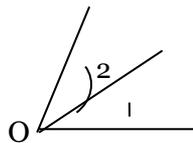


Supplementary angles: - When the sum of measure of two angles is 180° , the angles are called supplementary

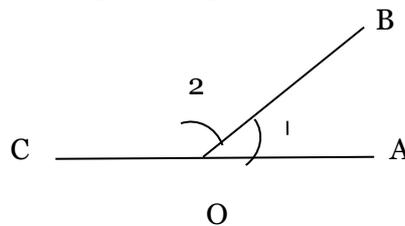
Example



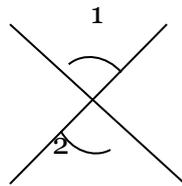
Adjacent angel:- Adjacent angles have a common vertex and and a common arm but no common interior points.



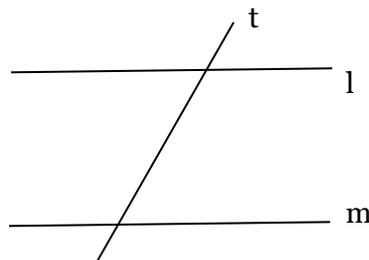
Linear pair: - A linear pair is a pair of adjacent angles whose non-common sides are opposite rays



Vertically opposite angles: - When two lines intersect, the angles on the opposite side of intersection point are called vertically opposite angles and they are always equal.

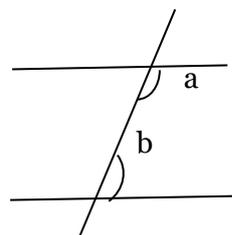


Transversal:- A line that intersects two or more lines at distinct points is called a transversal



If lines are parallel, corresponding angles are equal and alternate interior/exterior angles also equal.

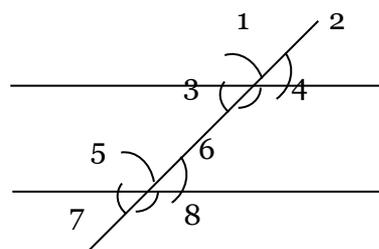
Moreover, if lines are parallel, each pair of interior angles on the same side of the transversal are supplementary i.e.



Participation of students: - (i) Find examples from your surroundings where lines intersect at right angles.

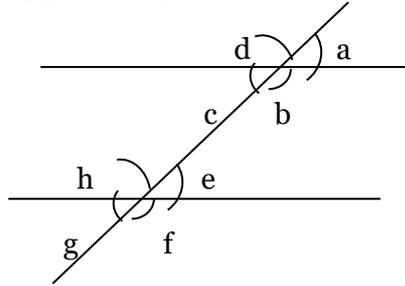
(ii) Try to identify a few transversals in your surroundings.

(iii) In the given figure, identify the interior angles, exterior angles, pair of corresponding angles, pair of alternate interior angles, alternate exterior angles and pair of interior angles on the same side of the transversal



- Recapitulation: -
- (i) Find the complement angle of 35°
 - (ii) Identify the pairs of corresponding angles, pair of alternate interior angles, and vertically opposite angles.

Figure



- Learning outcome: -
- (i) Identify lines, line segments, rays, and angles.
 - (ii) Classify angles as acute, right, obtuse or straight.
 - (iii) Identify complementary and supplementary angles.
 - (iv) Find measures of angles.

Topic : Congruence of Triangles

1. Learning Objective :-

- (i) To learn the concept of different types of triangles.
- (ii) To understand the concept of different rules (SSS, SAS, ASA, RHS)

2. Previous Knowledge Testing :-

- (i) What is the sum of three angles of triangle.
- (ii) What is the difference between isosceles triangle and equilateral triangle

3. Vocabulary used :-

Obtuse, Congruence, Criterion, Justified.

4. Important Spellings :-

Congruent, correspondence, perpendicular, hypotenuse.

5. Explanation with Innovative Methods :-

Black Boards, Paper cutting Method, Concrete Objects.

will introduce the topic with daily life examples. Congruence have same shape and same size. Teacher will also explain the paper cutting method and explain the definition of SAS, SSS, ASA and RHS.

6. Students Participation :-

Teacher will perform an activity for the students. She will cut the triangle of equal size. Students will overlap the cutting of triangles. In this way students understands the one-side of triangle overlaps to another sides of triangles.

Examples :- Shaving blades of same Company, Sheets of same letter pad.

7. Recapitulations :-

- (i) What do you mean if we say two objects are congruent?
- (ii) How can we show that two line segments are congruent?
- (iii) What are the various criterion for the congruence of two triangles?

8. Art Integration with other domain :-

Congruent triangle song – fun learning math!

9. Assessment :-

- (i) Two objects with same shape and same size are said to be _____.
- (ii) If $\triangle ABC$ is congruent to $\triangle DEF$ then $AB =$ _____, $BC =$ _____ and $CA =$ _____.
- (iii) The sides include between the angles L and M of $\triangle LMN$ is _____.
- (iv) In the congruence condition RHS, R stands for _____.
- (v) If all the three _____ of triangle are respectively equal to other triangle, then the triangles may not be congruence.

10. Learning Outcomes :

- (i) Students will be able to understand the concept of congruence.
- (ii) Students are able to understand the concept of all criterion.

Resources :-

Paper cutting Method, Cut Geometric Shapes for collage.
This helps teach and reinforce understanding of concepts.

11. Co-Scholastic Activities :-

Teacher will conduct the Quiz on congruence of triangles.



Class VII

Dated

Topic: - Algebraic Expression

Previous knowledge Testing: - (i) What is an algebraic expression?

(ii) Give few examples of algebraic expression.

Vocabulary used: - Variable, constant, co-efficient, algebraic, expression, polynomial, numerical

Important Spellings: - Coefficients, algebra, polynomial.

Objective: - Algebra forming simple expression activity. The child will know about the identities in algebraic expression and will be able to represent it geometrically. He will be able to know the relationship between algebra, geometry and arithmetic.

Aids/Innovative methods used to explain the topic: - First of all teacher will explain variables and terms with the help of an example i.e.

On Sonali's birthday her mother has organized a birthday party. She told her that she will give 3 sweets to each of her friend. Sonali is very excited she decides to find out how many sweets will be needed for distribution .

No. of Friends	1	2	3	4
No. of Sweets	3	3+3= 6	3+3+3=9	3+3+3+3= 12

No. of sweets = 3 x No. of Friends

No. of Sweets = 3 x n = 3n

The letter n is called variable, 3 is a constant.

Procedure: - Teacher will introduce the definition of variable, constant and then explain the definition of algebraic expression.

Variable: - The letters x, y, l, m _ _ _ _ etc to denote variable. A variable can take various values, Its value is not fixed.

Constant: - A constant has a fixed value example 4, 100, _ _ _ etc.

Algebraic Expression: - They are formed from variables and constants. We use the operations of +, -, X and ./ on the variables and constants to form expressions example $4xy + 7$, $3x+1$.

* Expressions are made up of terms. Terms are added to make an expression example.

In $7xy + 4$ expression, $7xy$ & 4 are the terms

* A term is a product of factors example $4xy$ is the product of factors 4, x and y

In $4xy$ term 4, x & y are the factors

* Coefficient is the numerical factor in the term. Sometimes any one factor is a term is called coefficient of the remaining part of the term.

* Any expression with one or more terms is called a polynomial

(i) One term expression is called a monomial.

(ii) Two term expression is called a binomial.

(iii) Three term expression is called a trinomial.

* Terms which have the same algebraic factors are like terms.

Terms which have different algebraic factors are unlike terms.

Example $4xy$ and $-3xy$ are like terms and the terms, $4xy$ and $-3x$ are unlike terms.

Participation of students: - 1) What are the terms in the following expression? Show how the terms are formed. Draw a tree diagram for each expression.

$$8y + 3x^2, 7mn - 4, 2x^2y$$

2) Identify the coefficients of the terms of following expressions

$$4x - 3y, a + b + 5, 2y + 5, 2xy$$

Recapitulation: - 1) Think of at least two situations in each of which you need to form two algebraic expressions and add or subtract them.

2) Simplify combining like terms.

$$(3y^2 + 5y - 4) - (8x - y^2 + 4)$$

3) Simplify and find the value at $x=4$, $Y=0$

$$4(2x - 1) + 3y + 4$$

4) What should be subtracted from $2a + 8b + 10$ to get $-3a + 7b + 16$?

Learning Objective: - The child will know about the identities in algebraic expression and will be able to represent it geometrically.

He will be able to know the relationship between algebraic geometry and arithmetic.

Learning outcomes At the end of the session, the students must be able to

* Identify the steps in evaluating algebraic expressions.

* Apply the steps in evaluating algebraic expressions.

* Show appreciation in working with group activity.

Assignments: - Exercise question of NCERT book and worksheets book will be given.

CLASS VII

1) **Topic:-** SYMMETRY

2) **Objective:-** 1. To learn the concept of line symmetry and rotational symmetry
2. Identify shapes and order of rotation.

3) **P.K. Testing :-**

1) Give two examples of two dimensional figures and three-dimensional figures.

2) What is the difference between 2D shapes and 3D shapes.

4) **Vocabulary used:-** Intersection, axis of symmetry regular hexagon, rotational symmetry.

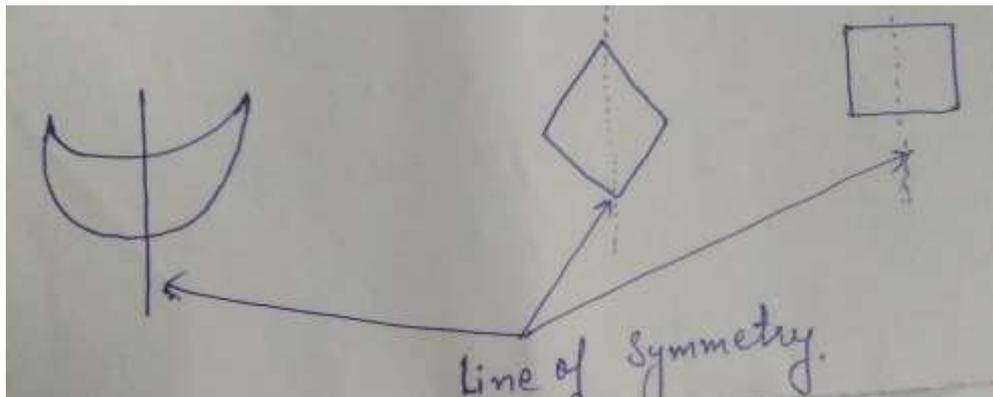
5) **Important Spellings :-** Intersection, axis, Rotational, Reflection.

6) **Explanation with Innovative methods**

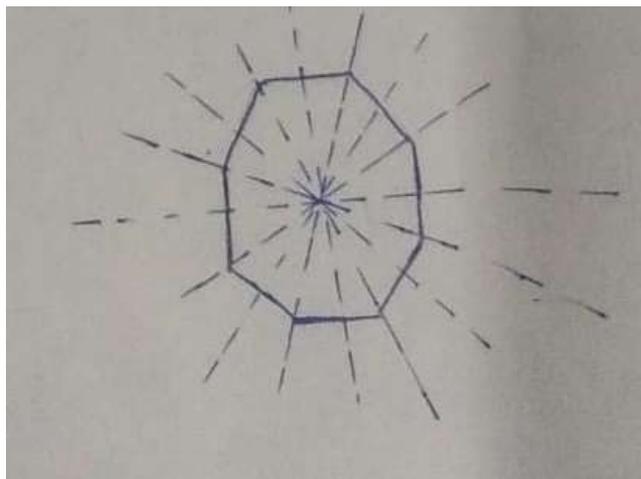
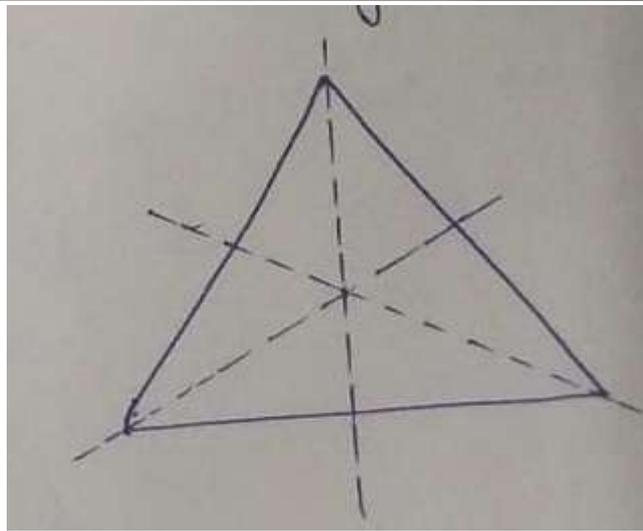
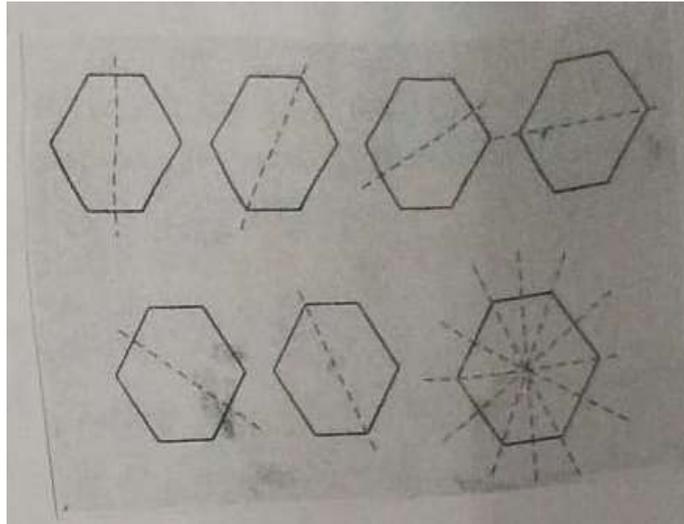
Take a blank sheet of paper, fold it in two halves and open it again. Spread some wet paint on one half, fold it back again and then press it slightly. Now when we unfold the paper slightly, a miraculously beautiful, Symmetric design appears on both sides of papers.

7) **Procedure :-** Teacher will explain the topic with introducing the definition with the help of Black Board. Symmetry abundant in nature. When we see certain figures with evenly balanced proportion. We say that they are symmetrical. If we fold a picture in half such that left half and right half match exactly then such type of picture is called symmetrical picture and line divides the picture into two parts is called the line symmetry or axis of symmetry. This folding line is also called axis line.

8)



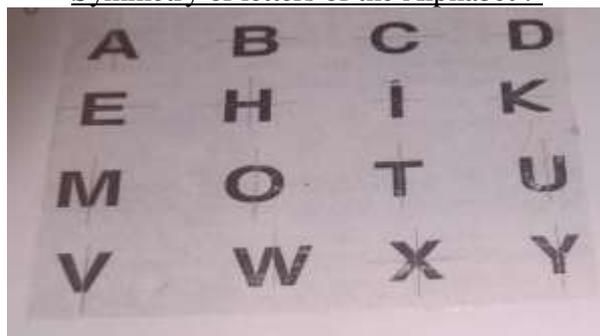
Line of Symmetry



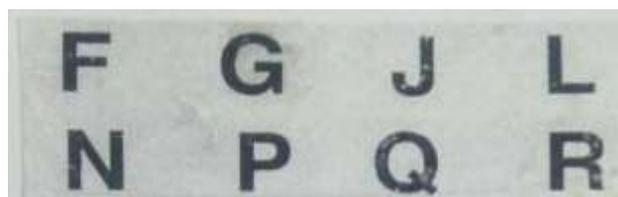
An equilateral triangle has three lines of symmetry.

- 8) **Students Participation** :- Teacher will explain the concepts with diagrams. Now students will actively participate in class for making the line of symmetry of alphabets.

Symmetry of letters of the Alphabet :-

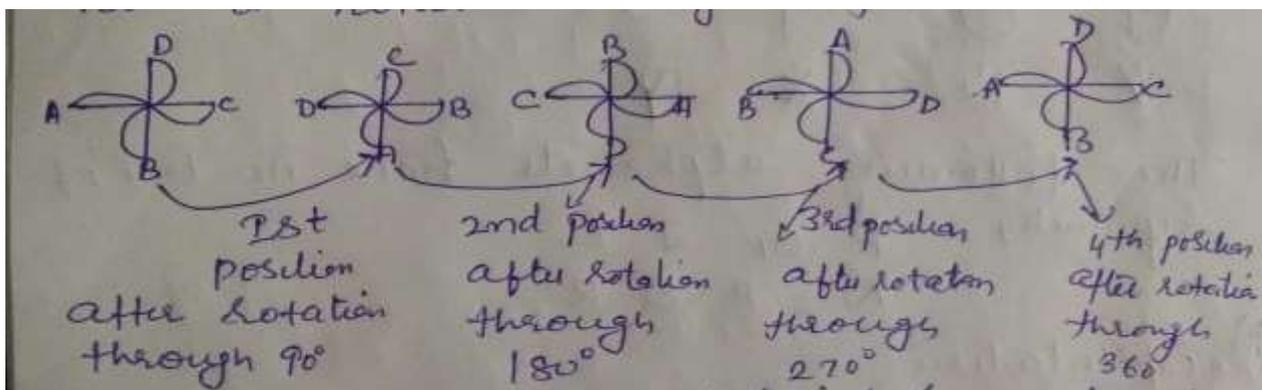


The following alphabets have no line of symmetry.



9) Art Integration with other domain :-

Make a paper windmill like the one shown in figure. If we rotate it through 90° about a fixed point the windmill will look exactly the same. We say that windmill has a rotational symmetry



We say it has rotational symmetry of order 4.

- 10) Co-Scholastic Activities :- Symmetry dance play some music. Let two children of same height hold one hand in the centre and perform dance moves like sharing hands in a similar manner in the opp. directions. guide children how to create symmetry postures on both the sides.
- 11) Recapitulation :- Teacher will ask the following questions.
- Q1. What is the difference between line symmetry and rotational symmetry.
- Q2. Name the alphabets which have no line of symmetry.
- Q3. Write the no. of line of symmetry of hermetical figure
- a) Square b) Rectangle c) Rhombus d) Regular Hexagon e) circle f) parallelogram.
- 12) Assessment :-
- Q1. Give two examples of symmetrical figures in daily life
- Q2. Give an examples of triangle having one line of symmetry, two lines of symmetry, no line of symmetry.
- Q3. Write an alphabets having

- a) vertical line of symmetry
- b) Horizontal line of symmetry
- c) No line of symmetry

13) **Resources** :- Lab manual activities, PPT, daily life activities on Symmetry

14) **Learning outcomes** :- By the end of this chapter students will able to understand.

1. Name and recognise the three different types of symmetry, reflection, rotational and line of symmetry.
2. Students will able to understand the different symmetry figure.

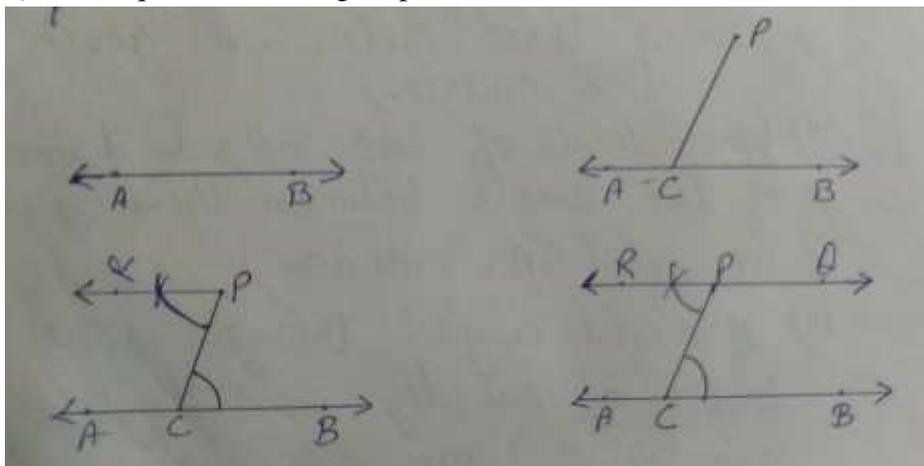
CLASS VII

- 3) **Topic:-** Practical Geometry.
- 4) **Objective:-** 1. To learn the concept of construction of angles
2. To learn the concept of triangle on the basis of different conditions.
- 3) **P.K. Testing :-** 1) Define an Angle.
2) What is a quadrilateral?
2) What is the angle sum property of a quadrilateral.
- 4) **Vocabulary used:-** Construction, Pair of compasses, Protractor, Perpendicular bisector.
- 5) **Important Spellings :-** Hypotenuse, Isosceles, Perpendicular
- 6) **Explanation with Innovative ideas :-** Geometry black Board
- 7) **Procedure :-** Teacher will Explain the:-
1. Construction of a line parallel to a given line, through a point not on the line.
2. Construction of triangles.
- When three sides are given
 - When length of two sides and measure of the angle between them are known
 - A right-angled triangle when length of the one leg and the hypotenuse are given.
- 8) **Contents :-** Construction of parallel lines (using ruler and compass)
Draw a line AB and from a point P outside AB, draw a line through P and parallel to AB using ruler and compass.

Steps of construction :-

- 1) Draw any line AB.
- 2) Mark any point P outside AB.
- 3) From P draw a line segment PC
- 4) At P draw $\angle RPC = \angle PCB$
- 5) Produce RP to Q.

Then RQ is the required line through P parallel to AB.



Case I

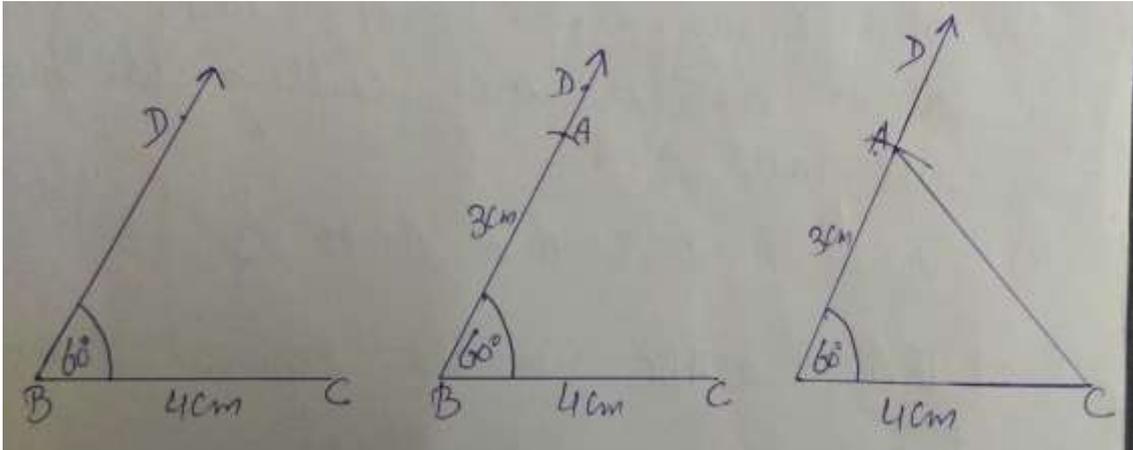
SAS Triangle Construction

To construct a triangle when two sides and the included angle are given.

Construct a $\triangle ABC$, having given $AB = 3\text{cm}$, $\angle B = 60^\circ$ and $BC = 4\text{cm}$

Steps of construction

1. Draw $BC = 4\text{cm}$ and at B draw a ray BD making an angle of 60° with BC
2. With B as centre and radius 3cm , draw an arc cutting BD at A
3. Join Ac



Case II

SSS Triangle Construction

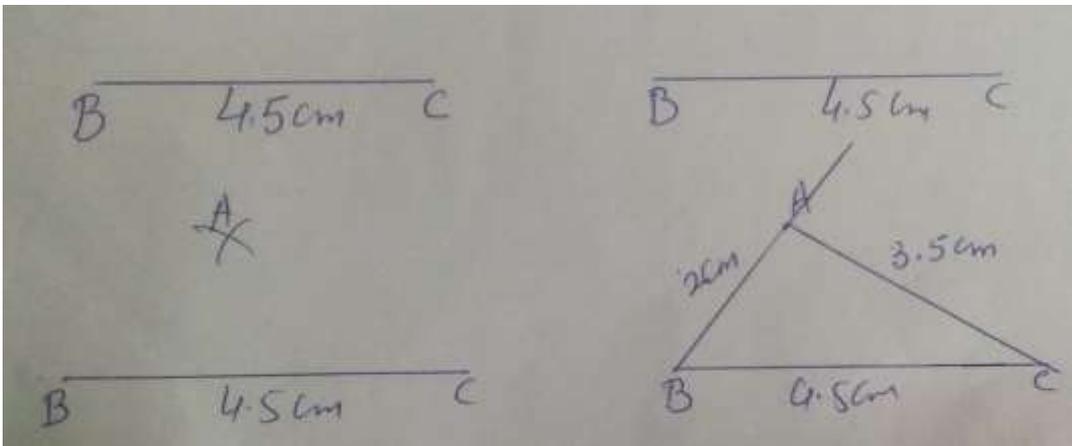
To construct a triangle when its three sides are given

e.g. Construct a $\triangle ABC$ in which $AB = 2\text{cm}$, $BC = 4.5\text{cm}$ and $AC = 3.5\text{cm}$

Steps of construction

1. Draw $BC = 4.5\text{cm}$
2. with B as centre and radius 2cm draw an arc
3. with C as centre and radius 3.5cm draw another arc cutting the previous arc at A.
4. Join A to B and A to c.

Then $\triangle ABC$ is the required triangle.



Case III

ASA Triangle Construction

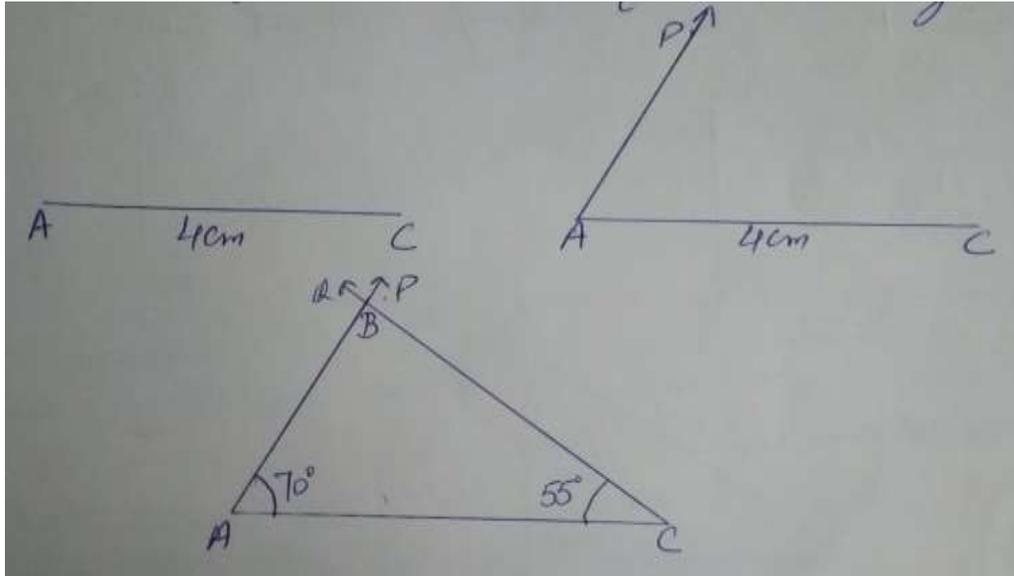
To construct a triangle when its two angles and the included side are given

e.g. construct $\triangle ABC$ in which $AC = 4\text{cm}$, $\angle A = 70^\circ$ and $\angle C = 55^\circ$

Steps of construction

1. Draw $AC = 4\text{cm}$
2. At d, draw $\angle PAC = 70^\circ$
3. At C, draw $\angle QCA = 55^\circ$

PA and QC intersect each other at B. Then $\triangle ABC$ is the required triangle



Case IV

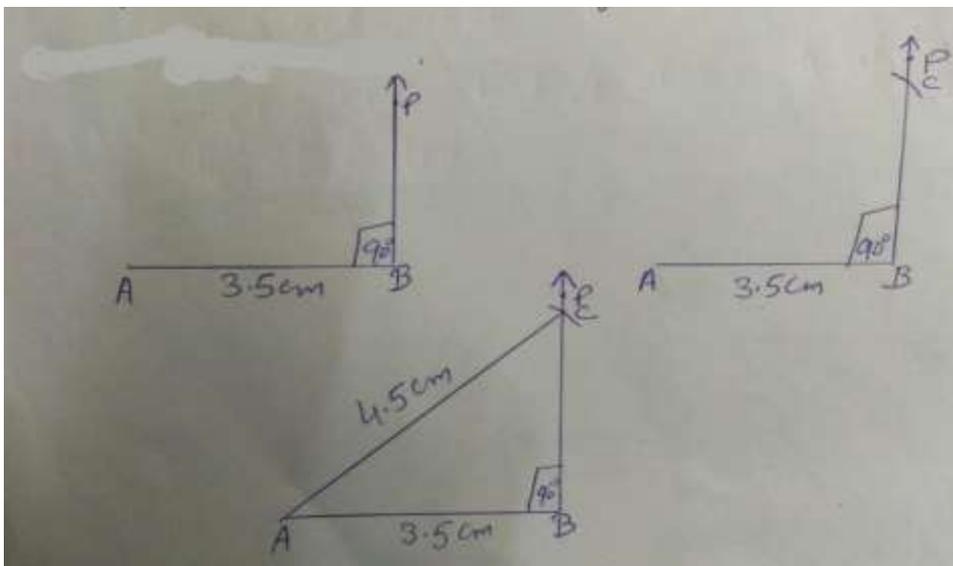
RHS Triangle Construction

To construct a right angled triangle whose hypotenuse and one side are given.
 e.g. construct a right angled triangle ABC having given hypotenuse
 $AC = 4.5\text{cm}$ and side $AB = 3.5\text{cm}$

Steps of construction

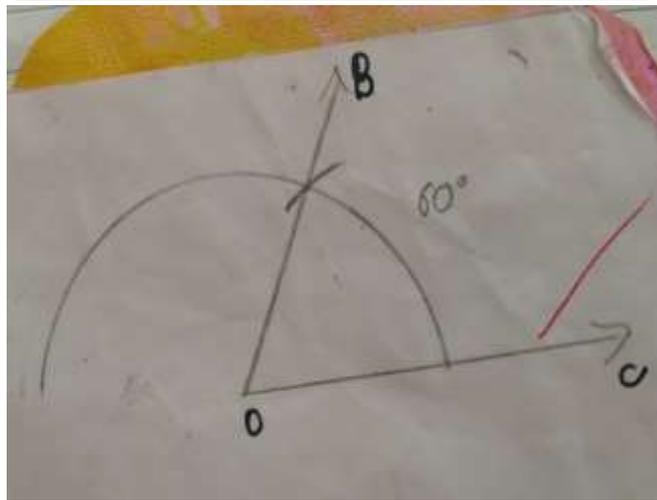
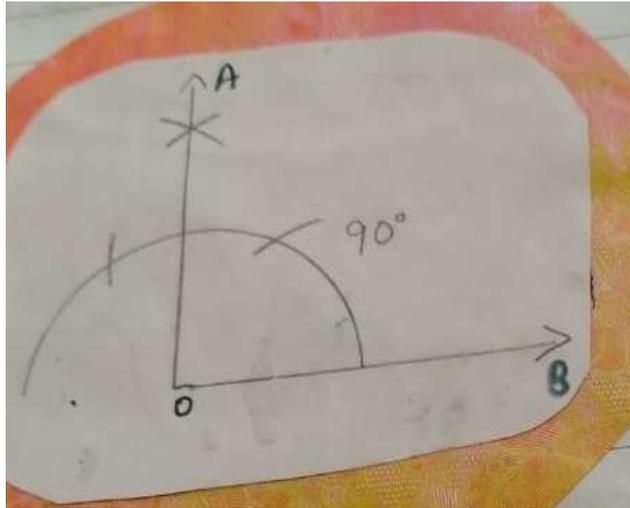
since AC is the hypotenuse, so $\angle B = 90^\circ$

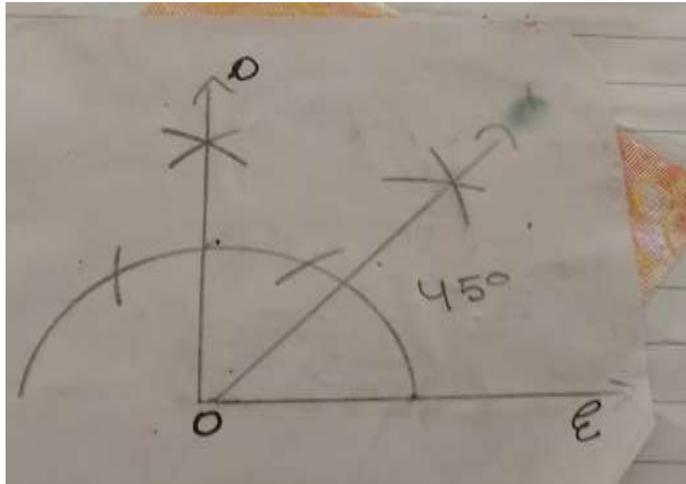
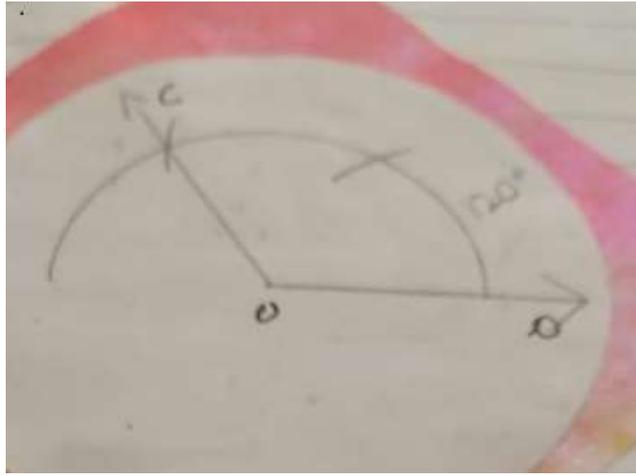
1. Draw $AB = 3.5\text{cm}$ and at B draw $\angle ABP = 90^\circ$
2. with A as centre and radius 4.5cm , draw an arc meeting BP at C.
3. Join AC.

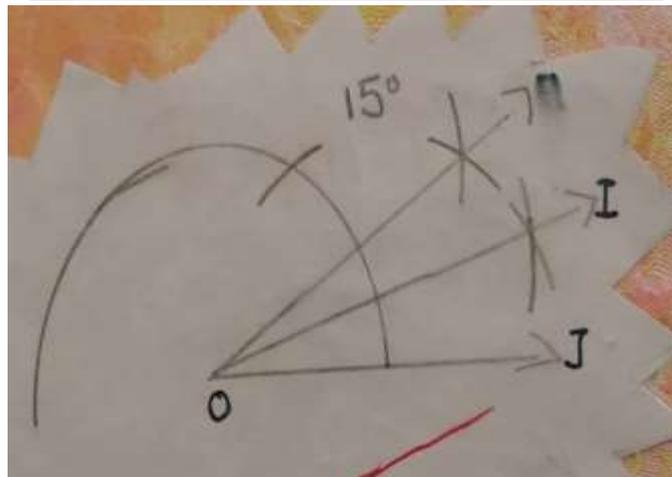
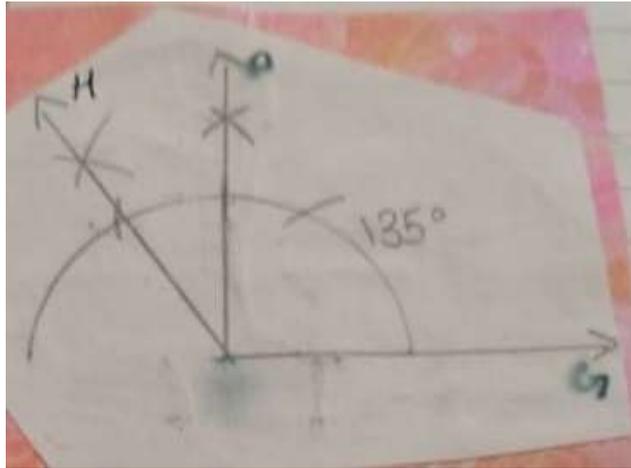


9) **Art Integration**:- Construction of angles on different shapes by paper cutting.

10) **Co-Scholastic Activity** :- Teacher will perform an activity







11) **Resources** :- black Board, Geometry, construction of angles on different shapes.

12) **Recapitulation** :-

1. Construct all the angles with compasses.
2. Construct a right-angled triangle whose hypotenuse is 6cm long one of the legs is 4cm long.

3. Examine whether you can construct DEF such that $EF = 7.2\text{cm}$ and $m\angle E = 110^\circ$ and $m\angle F = 80^\circ$. Justify your answer.
4. Construct ABC such that $AB = 2.5\text{cm}$, $BC = 6\text{cm}$ and $AC = 6.5\text{cm}$. Measure $\angle B$

Assessment :-

1. Construct a PQR such that $PQ = 5\text{cm}$, $QR = 4\text{cm}$ and $RP = 3.5\text{cm}$. Write the steps of construction
2. Construct an isosceles right-angled triangle in which one of legs is 3.6cm . Write the steps of construction.
3. Construct a LMN with sides $LM = 5\text{cm}$, $MN = 4\text{cm}$ and $NL = 4.5\text{cm}$. Draw XY parallel to LM passing through the vertex N. Write the steps of construction.
4. Construct DEF in which $DE = 5.2\text{cm}$ and $EF = 4\text{cm}$ and $\angle E = 120^\circ$. Write the steps of construction.

Class VII

Subject : Mathematics

Topic : Simple Equations

1. Previous Knowledge Testing :-

Teacher will ask about algebraic expression. Definition of equation, Variable and constant will be asked.

2. Vocabulary used :-

Algebraic expression, Equation, Variable, Constant.

3. Aids / Methods used :-

Blackboard, Book, Internet

4. Innovative Pedagogy :-

Teacher will use Black class and book to make concept more clear.

Linked Used :- https://youtu.be/5EQ6_nuE3d

5. Procedure :

An algebraic equation is an equality involving variable. It has an equality sign is equal to the value of the expression on other side.

Variable	Equality	Equation
$2x - 3$	=	7
L.H.S.		R.H.S

The word variable means something that can vary i.e. change. A variable takes on different numerical values.

An equation is a condition on a variable. The condition is that two expressions should have equal value.

Note that at least one of the two expressions must contain the variable.

Property of Equation :-

An equation remains the same when the expressions on the left and on the right are interchanged. This property is often useful in solving equations.

Writing the statement in equation form and equation in statement form will be explained.

Solving an Equation :-

An equation is like a weighing balance with equal weights on both its pans. If we add the same weights to both the pans, the arms remains horizontal. Similarly, if we remove same weights from both the pans, the arm remains horizontal on other hand if we add a different or remove weights to the pans, the arm of the balance does not remain horizontal.

We use this principle for solving an equation, Here, of course, the balance is imaginary and numbers used as weights that can be physically balanced against each other.

As we have seen, while solving equation one commonly used operations is adding or subtracting the same number on both sides of the equation. Transposing a number (i.e. changing the side of the number) is the same as adding or subtracting the number from both sides. In doing so, the sign of the number has to be changed.

Application of Simple Equation to Practical Situation :-

The method is first to form equations corresponding to such situations and then to solve those equations to give the solution to the puzzle/problems.

6. Co-Scholastic Activity :-

Participation of Students

Teacher will ask about variable and constant from the equation. Different equations will be given to them to solve.

7. Objectives :-

- (i) Students will be able to solve simple equation by substitution and Elimination.
- (ii) Students will be able to translate an equation in statement and statement in equation form.

8. Learning Outcomes :-

- (i) Students will be able to use hit and trial method to solve simple equations.
- (ii) Students will be able to separate the variables and constants and to find the value of variable.

9. Assessment :- Students will be asked to complete the given assignment.

- (i) Solve the equation by trial and error method.
 $3m - 14 = 4$
- (ii) Give the first step you will use to separate the variable and then solve the equation

$$2q + 6 = 12$$

(iii) Solve the following equation

a. $4 + 5(p - 1) = 34$

b. $16 = 4 + 3(t + 2)$

(iv) Set up an equation and find the unknown number

If 11 is subtracted from a number the result is -2 .

Find the number.

(v) The length of a rectangle is 5cm more than its

breadth. If the perimeter of the rectangle is 96 cm.

Find length and breadth of the rectangle.



Class VII

Subject : Mathematics

Topic : Triangle and its properties

1. Learning Objective :- To make the students able to :-

- (i) Identify interior and exterior angles of triangle.
- (ii) Find the missing angles of triangle by using angle sum property and exterior angle property.
- (iii) Understand Pythagoras theorem.

2. P.K. Testing :- Oral questioning will be done.

- (i) What are different types of triangle and how they differ from one another?
- (ii) What is angle sum property?

3. Vocabulary / Important spellings :-

Vertex, altitude, median etc.

4. Important Spelling :-

Equilateral, isosceles, scalene, Pythagoras, hypotenuse etc.

5. **Explanation with innovative method :-**

Teacher will show a triangle cutting and explain them about its definition i.e. A triangle is a polygon with three sides, three angles and three vertices. She will tell about types of triangle i.e. Equilateral, isosceles, scalene, acute angled, right angled and obtuse angled triangle. After this she will explain the properties of triangles with the help of activities.

PROPERTIES

- (i) The sum of all the angles of a triangle is 180° .
- (ii) The sum of any two sides of a triangle will always be greater than the third side.
- (iii) Exterior angle is always equal to the interior opposite angles. Content will be shown on black board.
- (iv) **Triangle Song :-**
<https://youtube/JY7AtoDalvk>

6. **Art Integration :**

- (i) **Angle sum property Activity :-**
<https://Youtube/vw-roqDBAVS>
- (ii) **Exterior angle Property Activity :-**
<https://Youtube/eAPUhUBpqdU>

Students will do these two activities in the class. After this teacher will explain them the concept of median, altitude and i.e.

(iii) Pythagoras theorem :-

In a right angled triangle the square of hypotenuse is equal to the sum of the square of perpendicular and base.

(iv) Activity :- Draw a right angled $\triangle ABC$ right angled at B with sides $AB = 3\text{cm}$, $BC = 4\text{cm}$ and $AC = 5\text{cm}$

(v) Now cut out three squares of sides 3 cm, 4cm, 5cm from graph sheet and paste them along the side ABC

(vi) Count the squares on each side.

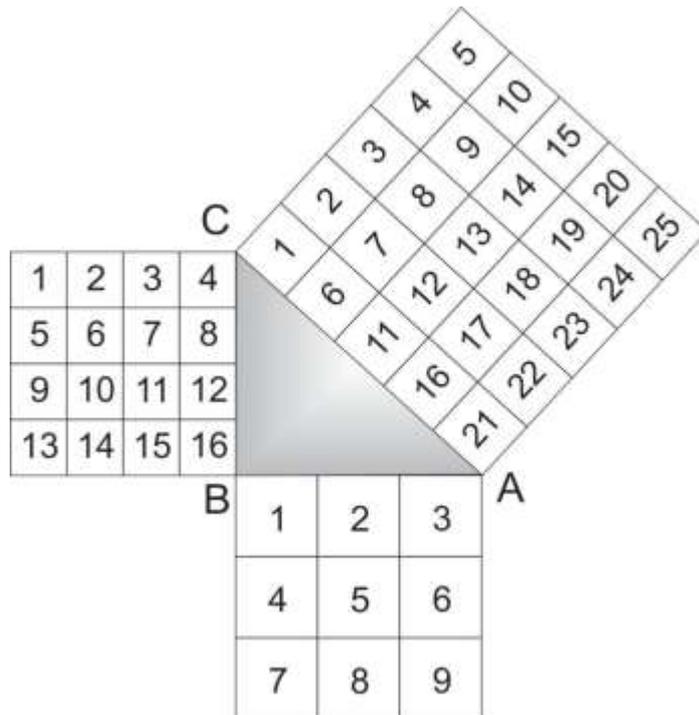
Number of squares on side $AB = 9 (3)^2$

Number of squares on side $BC = 16 (4)^2$

Number of squares on side $AC = 25 (5)^2$

Clearly $9 + 16 = 25$

$$(AB)^2 + (BC)^2 = AC^2$$



7. Co-Scholastic activities :-

A Cross word related to triangle and its properties from worksheet book will be given for solutions.

Resources :-

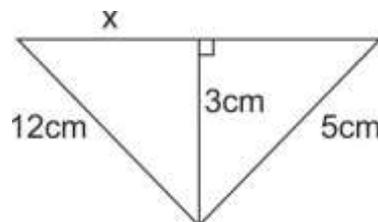
- (i) Mathematics Text book class VII (NCERT)
- (ii) PPT
- (iii) Lab Manual
- (iv) Work sheet book (Edu.HUB Pub)

8. Students Participation :-

Students will collect the picture of Pythagoras and Paste it in note book. They will write few lines about him.

9. Recapitulation / Assignment :- Solve the following

- (i) Two angles of a triangle are 30° and 80° . Find the third angle and name the type of triangle so formed.
- (ii) Is it possible to have a triangle with the following side
 - a. 3cm, 6cm, 7cm
 - b. 10.2cm, 5.6cm, 3.4cm
- (iii) The two interior opposite angles of triangle are always equal to its _____ angle (Fill up)
- (iv) The hypotenuse of right triangle is 13cm long. If one of the remaining two sides is of length 5cm, find the length of another side.
- (v) Find x if



- (vi) The angles of triangle are in the ratio 2 : 3 : 4. Determine the three angle.

10. Assessment :-

- (i) Class test will be conducted (Long questions, short questions, M.C.Q will be covered).

11. Learning Outcomes :-

Students will come to know about different Triangle and Properties, Median, altitude and able to relate Pythagoras in daily life.



Class VII

Subject : Mathematics

Topic : Comparing Quantities

10. Learning Objective :- Students will come to know about

- (i) Concept of ratio and proportion
- (ii) Unitary Method
- (iii) Percentage
- (iv) Conversion of fractions, decimals, ratio's into percentage and vice versa.
- (v) They are able to calculate profit, Loss, discount, simple interest, rate time etc.

11. P.K. Testing :-

- (i) Teacher will ask about ratio, percentage selling price, cost price, profit & Loss.
- (ii) Teacher will ask about meaning of simple interest.

12. Vocabulary / Important spellings :-

Comparing, Principal, Simple Interest, Percent

13. Important Spelling :-

Amount, Per Annum, Decrease

14. Explanation with innovative method :-

We often required to compare two quantities in our daily life. They may be height, weight, salary etc. Two ratio's can be compared by converting them to like fractions. If two fractions are equal we say that the two ratio's are equivalent. If two ratio's are equivalent then the four quantities are said to be in proportion. To make the concept more clear teacher will take help of a poem!

POEM

15. Art Integration :

A ratio compares

One thing to another

A proportion is two ratio's

Set equal to each other

Checking for proportion

Can be mustifying

Variables in proportion

Make you want to solve 'em'

Cause u can use three methods

to solve each & other problem

After this she will explain them the method to find Equivalent ratio, meaning of percentage, method to convert percentage to fraction or decimals

16. Co-Scholastic activities :-

To make the percentage concept more interesting a game will be played in the class.

Activity

Objective :- To evaluate percent of a number by using estimation.

Requirement :- Index card, 2 spinners with 0-9 written on them. One marked ones other tens

Steps:

- (i) Split students into two teams
- (ii) Call students from each team. Each student will take a turn spinning each spinner and forms a number as per place value. Let us say student spins '49'
- (iii) Other partner draw a card. Let's say 35. He/she write 49% of 35.
- (iv) Round off both digits to nearest tens i.e. 50% of 40.
- (v) The player that spun then computes 50% of 40. The correct answer will be the score for the round.
- (vi) Repeat the same by interchanging the players.

After this teacher will explain formula's related to profit and loss and their applications.

$$\text{Profit (S.P} > \text{C.P)} = \text{S.P} - \text{C.P}$$

$$\text{Loss (C.P} > \text{S.P)} = \text{C.P} - \text{S.P}$$

$$P\% = \frac{P}{C.P} \times 100$$

$$P\% = \frac{L}{C.P} \times 100$$

$$S.P = \frac{C.P \times (100 + P\%)}{100}$$

$$S.P = \frac{C.P \times (100 - L\%)}{100}$$

$$C.P = \frac{100 \times S.P}{100 + P\%}$$

$$C.P = \frac{100 \times S.P}{100 - L\%}$$

To explain the concept of simple interest teacher will explain the sums with the help of formula's.

$$\text{Simple interest} = \frac{\text{Principal} \times \text{Rate} \times \text{Time}}{100}$$

$$\text{Amount} = P + S.I$$

17. Students Participation :-

Student will write all formula's on a colored chart:

Resources :-

- (iii) Mathematics Text book class VII (NCERT)
- (iv) Black board

- (v) Worksheet book (Edu.Hub)

18. Recapitulation / Assignment

- (iii) Find 7.5% of 80Kg.
- (iv) 8% of 5l
- (v) Calculate what % of 40m is 16m.
- (vi) Rohit bought a stereo for Rs. 5863. Due to some defects, he had to pay Rs. 137 to mechanic for its repair. Then he sold it for Rs. 5700. Find his loss percent.
- (vii) In case of profit, which is more S.P or C.P.
- (viii) Find the equivalent fraction of 20%.
- (ix) Find the interest on loan of Rs. 5200 that is borrowed at 9% p.a. for 7 months.
- (x) Find 200% of 200.
- (xi) Find the ratio of 2 hours to 60 seconds.
- (xii) Convert each part of ratio to percentage 2 : 3 : 5.

19. Assessment :-

- (vi) C-test will be conducted in the form of M.C.Q, T/F, Long / Short / Value based sums.

20. Learning Outcomes :-

At the end of chapters students will be able to calculate.

- (i) Percentage
- (ii) Profit / Loss
- (iii) Simple Interest related problems



Class VII

Subject : Mathematics

Topic : Rational Numbers

1. Learning Objective :- To attain mastery on Rational Numbers.

2. Previous Knowledge Testing :-

Teacher will ask definition of

(i) Whole Numbers :- Counting numbers starts from zero i.e. 0, 1, 2, 3

(ii) Natural numbers :- Counting numbers starts from. i.e. 1, 2, 3

(iii) Integers :- All positive numbers, and negative numbers including zero are integers.

3. Vocabulary used :-

Number line, Rational numbers, Integers, Properties of Rational Numbers.

4. Important Spellings :-

(i) Closure property

(ii) Commutative

- (iii) Associative
- (iv) Additive
- (v) Multiplicative Inverse
- (vi) Distributive

5. Aids / Innovative Methods used to explain the topic:-

- (i) Blackboard
- (ii) Number line with the help of students.

6. Procedure :-

Teacher will explain the definitions of natural numbers, whole numbers and integers before explaining rational numbers.

Rational Numbers :-

A number which can be written in the form of $\frac{p}{q}$, where p and q are integers and $q \neq 0$ is called a rational number. E.g. $\frac{5}{8}, \frac{2}{7}$

Rational Numbers on a number line :-

Representation of rational numbers on number line will be explained to students. The points to the right

of 0 are denoted by positive sign and are positive rational numbers. The points to the left of 0 are denoted by negative sign and are negative integers.

Rational Numbers in standard form :-

The denominators of these rational numbers are positive integers and 1 is the only common factor between the numerators and denominators. Negative sign occurs only in the numerator. Such rational numbers are said to be in standard form.

Comparison of rational numbers and rational numbers between two rational numbers will be explained.

Operational on Rational Numbers :-

All four operations i.e. Addition, subtraction, multiplication and division will be explained to students.

Additive Inverse:-

$-\frac{a}{b}$ is additive inverse of $\frac{a}{b}$ or vice – versa.

Multiplicative Inverse :-

$\frac{a}{b}$ is the multiplicative inverse of $\frac{b}{a}$ or vice – versa.

7. Participation of Students :-

Teacher will ask about the smallest and largest whole and natural numbers. Additive and multiplicative inverse of $-\frac{3}{2}$, $\frac{6}{8}$, $-\frac{5}{4}$. Properties of rational numbers will also be asked from students.

8. Art Integration :-

Following link is used to show addition of rational numbers.

<https://youtu.be/nGestZ3yKo>

9. Recapitulation :-

All the definitions and separations on rational numbers will be revised.

10. Assignment :

Students will be asked to complete the given assignments.

(i) Write additive numbers of $-\frac{8}{7}$.

(ii) Insert three rational numbers between $-\frac{5}{7}$ and $\frac{3}{5}$

(iii) Add :- $1\frac{2}{3} + 2\frac{4}{5}$

(iv) Subtract :- $-2\frac{1}{9} - 6$

(v) Find the value :- $\frac{-7}{12} \div \left(\frac{-2}{13}\right)$

11. Learning Outcomes :- Students will know and understands

- (i) Every rational number can be represented on a number line.
- (ii) Various rational numbers between two rational numbers.
- (iii) Develop the ability to solve Rational numbers.

CLASS 7th

Topic: - Perimeter and Area

Objectives: - Upon completion of the lesson students will be able to -

- Define perimeter
- Define are
- List the formulas for finding perimeter and area of different shapes

PK Testing: -

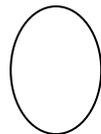
1. What is perimeter of a plane figure?
2. What is the area of a plane figure?
3. What is the difference between perimeter and area?
4. What is the perimeter of a square and rectangle?
5. What is the area of a square and rectangle?

Vocabulary: - Area, perimeter, polygon, altitude, circumference , diameter.

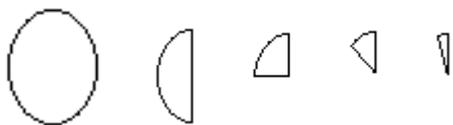
Important Spelling: - Area, perimeter, altitude, circumference.

Explanation with innovative method:- Teacher will use the black board to make the concept more clear.

Activity: - Teacher will draw a circle of radius r on white drawing sheet and cut it out with the help of a pair of scissor to get a circular disc.



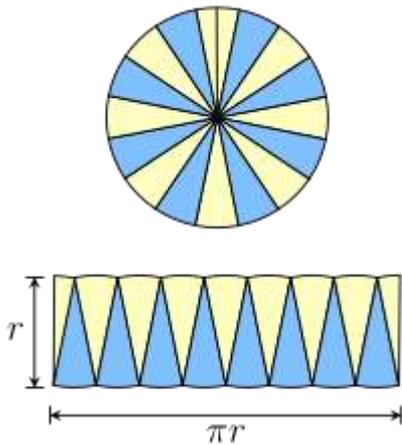
After this teacher will fold the circular paper as shown in figure



Unfold the circular disc, teacher will divide it into 16 equal parts.

Then teacher will tell to a child to colour the upper half of the circular disc with blue colour and lower half with pink colour as shown in figure.

At last, teacher will cut this circle into 16 parts with the help of scissor and paste them on a white drawing sheet as shown in figure: -



Length of parallelogram = $\frac{1}{2}$ (Circumference) = $\frac{1}{2} \times 2\pi r = \pi r$

Breadth of parallelogram = radius of circle = r

Area of Parallelogram = $l \times b = \pi r \times r = \pi r^2$

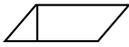
Area of circle = πr^2

Procedure :- Teacher will introduce the perimeter and area of a closed figure.

Perimeter :- It is the total distance around a closed picture.

Area :- It is the part of the plane occupied by the closed fig.

Then teacher will tell the children to draw the following shapes

Shapes		Perimeter	Area
Square		4 x side	(side) ²
Rectangle		2 (length + breadth)	length x breadth
Parallelogram		2(a+b)	b x h
Triangle		sum of all sides	$\frac{1}{2} \times b \times h$
Circle		$2\pi r$	πr^2

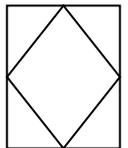
Students participation: -Students will find the circumference of a circle under the guidance of teacher. One child name Tanya cut different cards, in curved shape from a cardboard. She wants to put lace around to decorate three cards. Teacher will tell her to find the length of the lace required.

Mark a point on the edge of the card and place the card on the table mark the position of the point on the table also new roll the circular card on the table along a straight line till the marked point again touches the table. Measure the distance along the line. This is the length of the lace required.

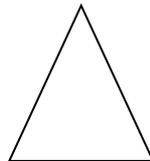
Recapitulation: -1. Which square has the larger perimeter?

2. Find the area of a triangle where base is 5 Cm and altitude is 6 Cm

3. Find the area of a circle where diameter is 9.8 m.



Art integration with other domain: - Teacher will explain them to do bamboo craft. Student will make a square and a triangle using match sticks and they will find perimeter.



Teacher will tell them a poem on perimeter and area, which will develop singing skill in them.

Area and perimeter sitting in a tree. Looking at the garden as spacious as can be Area is the space that you see on the ground perimeter is the fence that you put all around.

Learning outcomes: - The students will be able to

- Restate the formula and perimeter of rectangle and square
- Compute the area of a parallelogram, given the length of its base and height.
- Compute the area of a triangle and circle.
- Determine which concepts and formulas are needed to complete each practice exercise.

- Resources: -
- 1 NCERT book
 - 2 Black Board
 - 3 Lab Activity manual

Co-scholastic activities: - By making different shapes using match sticks will develop art and craft skills and by reciting poem will develop singing skill. Moreover teacher will tell the students to write your name on the graph paper using square and find area of the sheet used to write your name. which will enhance their drawing skill.

- Assessment : -
1. Find area of a square park whose perimeter is 320 m
 2. Find height of a triangle whose area is 36 cm^2 and base is 3 Cm.
 3. What is the circumference of a Circular disc of radius 14 CM
 4. Find area of a circle of radius 30 Cm.
 5. How many times a wheel of radius 28 Cm must rotate to go 352 m?

Class VII

Topic : - Exponents and Powers

Objective: - The numbers which are very large to read, understand, compare and operate upon, by using this concept of exponents and powers make all these easier. We use exponents, converting many of the large numbers in a shorter form.

- Pic testing
1. What is an exponent?
 2. What does a power of a number tell us?
 3. Write 125 into factor.
 4. Write $5 \times 5 \times 5$ in terms of power.

Vocabulary Bar, power, exponent, reciprocal.

Important spellings: - Reciprocal, Bars, Power, Exponent.

Explanation with innovative methods: -

To find the value of 2^0 , 2^1 , 2^2 experimentally using coloured papers, scale, a pencil, an eraser, a pair of scissors and glue.

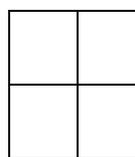
- Cut a rectangle on a coloured paper, for bars 2, tow parts are folded.
- A rectangle with no fold represent 2^0
- New fold the paper along the width into tow parts creating one fold which shows that 2^1 equals 2 as shown in fig (b).
- Again fold the paper once more, ie, the number of folds are 2 now and four parts are created. $2^2 = 4$ as shown in fig (c).
- Again fold the paper once more ie the number of fold are 3 new and 8 parts are created. $2^3 = 8$ as shown in fig (d)
- By recording these observation, students will see how exponents are useful in creating geometrical pattern.



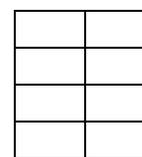
(a)



(b)



(c)



(d)

Value of exponent (No of folds)	0	1	2	3
Result	$2^0=1$	2	4	8

Procedure: - Teacher will write $4 \times 4 \times 4$ on the chalk board and ask, how can we write in other form?

Teacher will extend the idea by saying that this form of notation is known as exponential notation where 4 is called the base and 3 the exponent and 4^3 is read as 4 raised to the power 3. Similarly, $(-4)^3$ means $(-4) \times (-4) \times (-4)$ and is read as -4 raised to the power 3.

Afterward teacher will write some exponential laws on the board and tell to students to write on their note books

1. $a^n \times b^n = (ab)^n$
2. $a^n \times a^m = a^{n+m}$
3. $a^n \div b^n = (a/b)^n$
4. $a^n \div b^m = a^{n-m}$
5. $a^0 = 1$
6. $a^{-n} = 1/a^n$
7. $(a^n)^m = a^{nm}$

Then teacher will encourage the students to do exercise question. Teacher will move in class and observe the students. Teacher will motivate, stimulate and interfere if there would be any trouble arise. She will try to resolve their problems.

Students Participation: -Teacher will write few sums on board and call the students one by one to solve it on board. After this, teacher will give some pairs of numbers and will ask find the greater number like 2^8 or 8^2

Recapitulation: -

1. Write $8 \times 8 \times 8 \times 8$ taking base as 2
2. Simplify $[(2^2)^3 \times 3^6] \times 5^6$
3. Express 70,00,000 in the standard form
4. Identify the greater number 100^2 or 2^{100}

Art Integration: - Teacher will tell the students to make a chart on the properties of exponents by dividing into six equal parts. Through this activity the art of equal distribution and drawing skill will be developed.

Learning outcomes: - The students will be able to -

- Define exponents
- State the laws of exponents.
- Express numbers in the exponential form
- Compare very large and very small number.

Resources: - Black board, NCERT books and lab manual.

Co-Scholastic activities: -The law of exponents song

With a power to a power you multiply exponents, the laws of exponents, go like this, go like this, go like this. The laws of exponents go like this, all day long.

When adding like bases, you combine like term, _____, _____, $a^4+3a^4=4a^4$

When multiply like bases, you add the exponents _____, _____, $Y^a \times Y^b = Y^{a+b}$

When dividing like bases, you subtract the exponents, _____, _____, $x^a/x^b = x^{a-b}$

With a power to a power, you multiply exponents, _____, _____, $(x^a)^b = x^{ab}$

With a negative power, make it positive and positive and _____, _____, $x^{(-a)}/y^{(-b)} = y^b/x^a$

Any base with zero power is equal to 1, _____, _____ $x^0 = 1$

And now you know the laws of exponents, _____, _____ and you are ready for test.

Assessment: - Choose the correct option

- (711/233)⁰ is equal to
(a) 1 (b) 0 (c) 711/233 (d) None
- The value of (-1/3)³ is
(a) 0 (b) positive (c) negative (d) None
- The expression [(-5)³]² is equal to
(a) (-5)⁵ (b) (-5)⁶ (c) 5⁵ (d) 5⁻⁶
- $a^m \times a^n =$ _____
(a) a^{mn} (b) a^{m-n} (c) a^{m+n} (d) $axmxn$
- If $2^{-2} \times 2^n = 2^2$, then the value of n is
(a) 2 (b) -2 (c) 4 (d) 0

Also students will complete all exercise of NCERT book.

Class VII

Subject : Mathematics

Topic : Visualising Solid Shapes

1. Learning Objective :-

The students will be able to identify various 2-D, 3-D shapes along with their faces, edges and vertices.

2. P.K. Testing :- Teacher will ask to create any shape out of craft sheet and to find its vertices, edges and faces.

3. Vocabulary / Important spellings :-

One dimensional, Two dimensional and three dimensional figures, oblique sketches, Isometric sketches

4. Important Spelling :-

Quadrilateral, vertices, faces edges, pyramid, Prism.

5. Explanation with innovative method :- Brief Introduction of Chapter will be given i.e.

Two dimensional figures :- The figures which can be drawn on a plane or surface are called 2-D shapes e.g. :- square, rectangle, triangle, quadrilateral circle etc.

Three dimensional figures :- 3-D shapes have volume and they occupy space. eg:- Cuboid, Cube, Con, Sphere, Pyramid etc.

- (i) Solid shapes have vertices, edges and faces;
- (ii) A net is a two dimensional shape which is used to form a solid. A same solid can have many types of nets.
- (iii) Two types of sketches are possible.
 - a. **An oblique sketch** : It does not have proportional length but appears as solid
 - b. **An Isometric sketch** : In this sketch measurement is kept proportional.

Content will be explained with the help of black board and (<https://youtube/IROMfU97tFk>)

ACTIVITY

6. Art Integration :

- (i) Teacher will encourage the students to make various solid shapes by using waste material, card board,

coloured sheets etc and write their faces, edges and vertices.

- (ii) To make the concept of 2D and 3D more clear a video will be shown (<https://youtube/PtE65ytx4DA>)

After this teacher will explain the slicing of different 3D shapes with the help of link i.e. (<https://youtube/hlD-j3AtxGs>)

7. Co-Scholastic activities :-

- (i) Make clay (or Plasticine) models of the Cuboid, Cylinder, Sphere, Cone Pyramid etc and make vertical and horizontal cuts.
- (ii) Draw rough sketch of the Cross-sections you obtain.

8. Students Participation :-

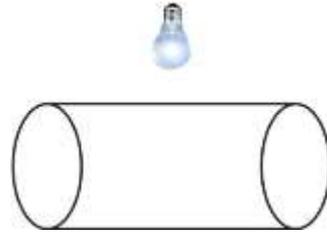
Shadow play activity based questions are given for solution eg:

- (i) Keep a torch light, right in front of cone. What type of shadow does it cast on the screen?
- (ii) Name the shapes of shadows obtain each when bulb is kept burning just above these shapes

- (a) A Ball



(b) A Cylindrical Pipe



Resources :-

- (i) Mathematics Text book class VII (NCERT)
- (ii) PPT (Youtube Videos)

9. Recapitulation / Assignment :- Solve the following

- (i) A point where surfaces meet is called _____
- (ii) A point where surfaces meet is called _____
- (iii) A cube has _____ vertices _____ edges and _____ faces.
- (iv) A square prism has _____ base.
- (v) A solid figure which has no vertex and no edge is called a _____

Question : Three cubes of side 3 cm are joined to each other in a row.

- (i) What shape will you get?
- (ii) Write its dimensions
- (iii) The new shape on joining is seen from top and side. Draw rough sketch when.

- a. Seen from top
- b. Seen from side

Question : What cross-sections do you get when you give a

- (i) Vertical Cut
- (ii) horizontal cut
- (a) Cuboid
- (b) Sphere
- (c) A die
- (d) A circular pipe
- (e) An Ice-cream cone.

10. Assessment :-

Daily assignment from the text book and work sheet and c-tests will be done

11. Learning Outcomes :- After this lesson, students will be able to

- (i) Explain what is meant by dimensions of figures
- (ii) Specify dimensions of bounded figures rotations or reflections.
- (iii) Able to describe vertices, edges, faces of figures

