Class IX

Subject : Mathematics

Chapter : 1

Topic : Number System

No. Of Days : 10

1. P.K. TESTING :-

This lesson requires

1. Basic knowledge of natural numbers, whole numbers, rational numbers, irrational numbers, real numbers.
2. Knowledge of basic construction and number line.
3. Knowledge of exponents.

2. LEARNING OUTCOME :-

KNOWLEDGE-Students will develop the ability to understand:

1. Natural numbers, whole numbers, integers, rational and irrational numbers.
2. The method of plotting square root of natural and decimal numbers on the number line.
3. The laws of exponents

3. AIDS/INNOVATIVE METHODS USED TO EXPLAIN THE TOPICS:

- Smart board,
- Square root spiral of $\sqrt{2.5}$ with coloured paper

Material Required:-

Coloured paper / pens, scissors, geometry box, fevistick.

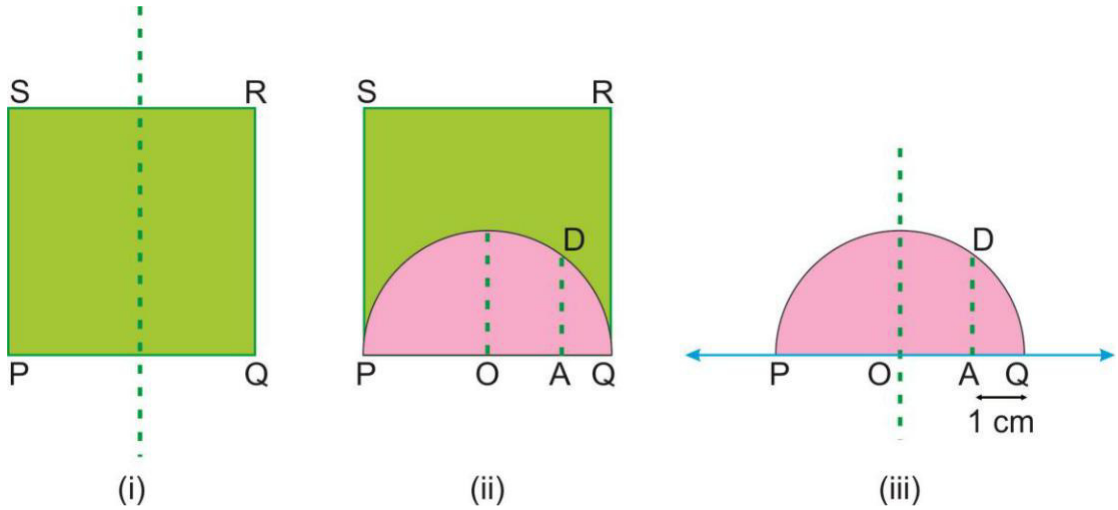
Procedure

(i) Take a coloured square paper f 3.5cm × 3.5cm and name it PQRS

(ii) Make a point A on PQ s.t PA = 2.5cm

(iii) Fold the square paper to find the center point of PQ

(iv) Draw a semicircle with centre O and radius = OP = OQ



(v) Fold the semicircle at vertex A st folded line must be perpendicular to PQ. Name it as AD.

(vi) Take replica of the semicircle and paste it on the line named *l*.

(vii) Cut the semicircle w.r.t ar AD (faded line)

(viii) Paste AD from figure 4 to figure 5 s.t D point lies on the line l as shown in figure 6.

(ix) AD point represents $\sqrt{2.5}$ on the no line.

4. PEDAGOGICAL STRATEGIES :-

Ppt and Digital Content would be shared

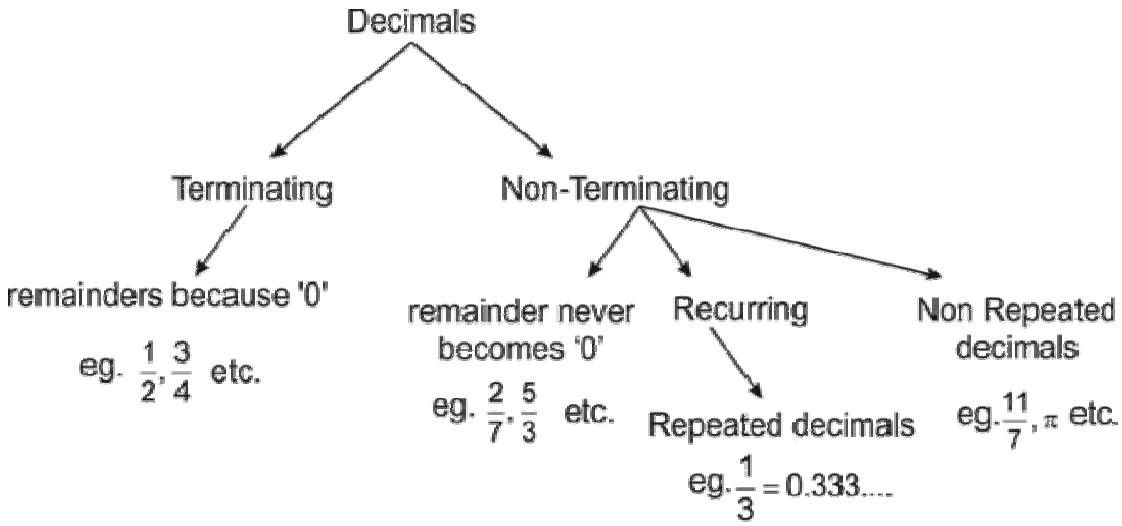
5. ART INTEGRATION :-

Charts representing square roots and real no's on Number line.
Presentation on the operations of various properties on real no's, the identities of square roots and the laws of exponents.

6. LIFE SKILL :-

Students would be able to critically apply the concepts in given situations and collaboratively realize the fact that infinite number of rational numbers can be inserted between two rational numbers.

7. FEEDBACK AND REMEDIAL TEACHING RECAPITULATION :



6. ASSESSMENT

ASSIGNMENTS **:**

1. Express the 5.434343__ as a rational number in p/q form.
2. Write two examples each of two irrational numbers whose difference is a rational number and sum is irrational number.
3. Rationalize 3+√2 / 3√2.
4. Locate √10 on number line.
5. Represent √7.6 geometrically.
6. Solve 8⅓ X 16⅓ X 32⅓

7. INCLUSIVE PRACTICE AND FULL PARTICIPATION :-

Due to various social backgrounds and multiple intelligences, the classroom might be a diverse arena. The following techniques can be used for various groups:

For gifted students:

- Encouragement for referring other resources

For weak students:

- Spiral Level 1 to be completed
- Buddy help to be provided
- Provide grade-up classes

Class IX

Subject : Mathematics

Chapter : 2

Topic : Polynomials

No. Of Days: 15

1. P.K. TESTING:-

This lesson requires:
1. Basic knowledge of algebraic expression, terms, coefficient.
2. Knowledge of exponents.
3. Knowledge of equations and how to solve them.

2. LEARNING OUTCOME :-

Students will develop the ability to understand

1. The classification of polynomials on the basis of the number of terms and the degree.

2.The method of using zeroes in order to find whether a given polynomial is the factor of the other given polynomial or not.

3. Where and how to use factor theorem.

4. The method of using identities in order to find the product of two polynomials and in their factorization.

3. PEDAGOGICAL STRATEGIES :-

Access the videos relevant to the lesson from the library resources.

4. ART INTEGRATION :-

Make chart on Algebraic Identities

Activity Topic : Algebraic Identities

Objective : To verify the algebraic Identity

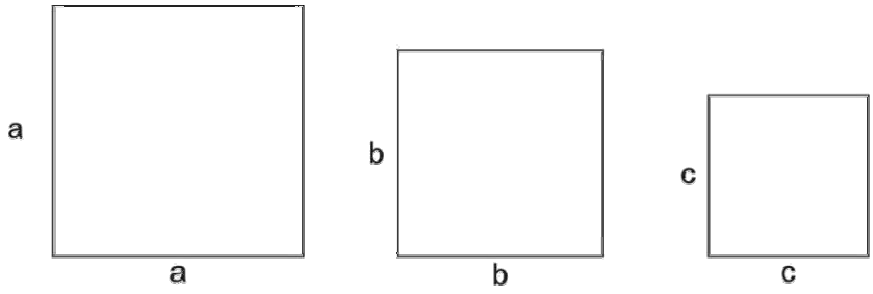
$$(a+b+c)^2 = a^2 + b^2 + c^2 + 2ab + 2bc + 2ca$$

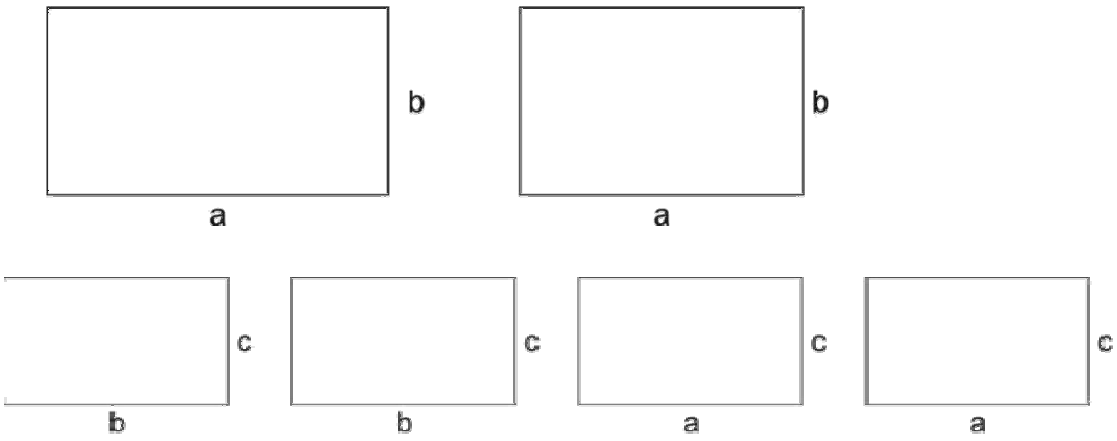
Prior Knowledge : Area of square = s × s
Area of rectangle = *l* × b

Material required : White drawing sheet, glazed sheets, cutter, sketch pens, fevistick

Procedure :-

Cut three spheres of side a unit, b unit and c unit (a > b > c) from a red paper.

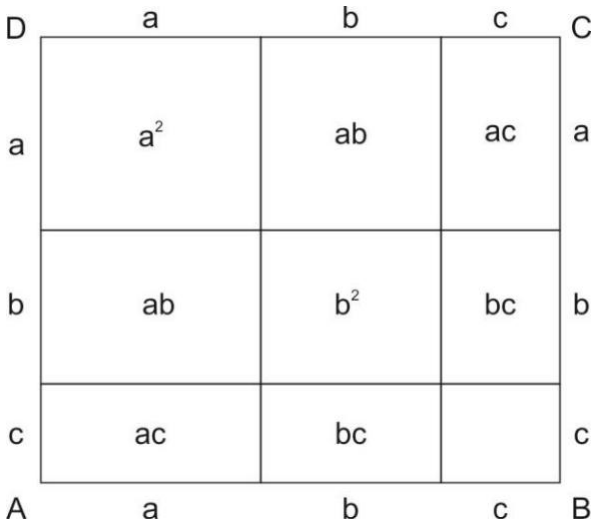




(i) Cut 2 rectangles of b × c units

(ii) Cut 2 rectangles of a × c units

(iii) Paste the above 9 quad. on the sheet as shown below.



Area of square = $(a + b + c)^2$

Area of all three squares and six rectangles

$= a^2 + b^2 + c^2 + ab + bc + bc + bc + ca + ca$

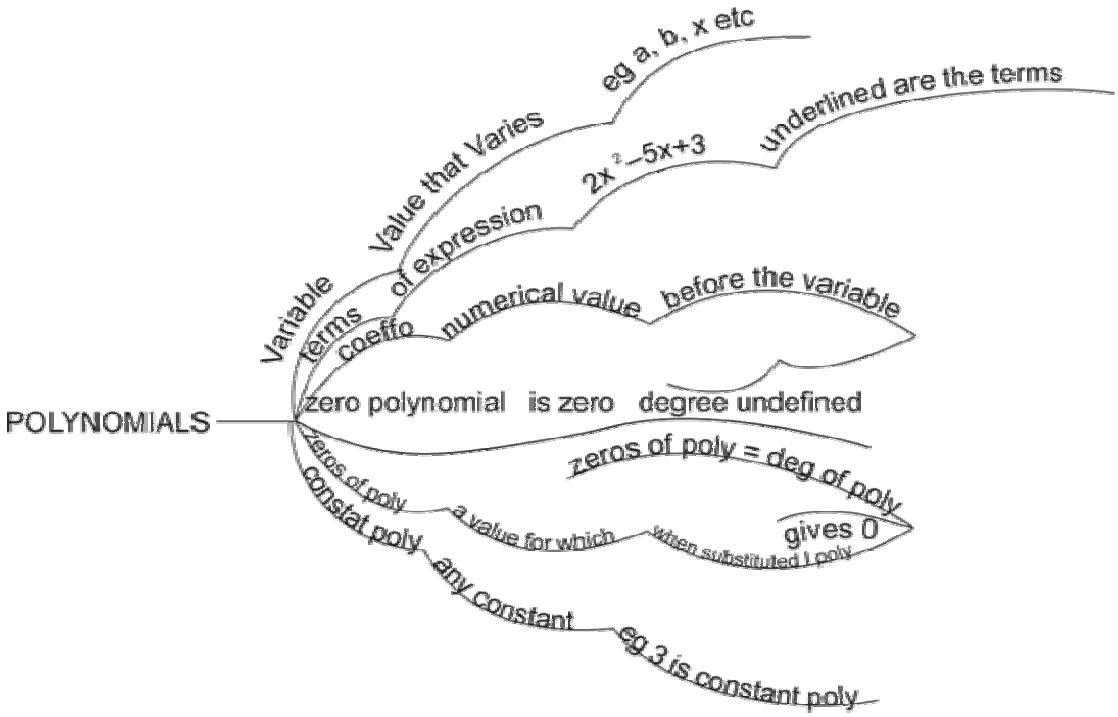
$= a^2 + b^2 + c^2 + 2ab + 2bc + 2ca$

5. LIFE SKILL :-

- Students will be able to analyse the zeroes and factors of polynomials
- Students will be able to
  - Comprehend and Explain Algebraic Identities
  - Analyse the use of these algebraic identities to factorise the algebraic expressions and see their utility in computations.

6. FEEDBACK AND REMEDIAL TEACHING RECAPITULATION :-

Students will be learning identities by heart.



7. ASSESSMENT

ASSIGNMENTS**:**

1. Find k if 2–x is a factor of $kx^2 - 2x + 1$.
2. If 1 and 3 are zeros of the polynomial p(x). Write the polynomial p(x).
3. Evaluate using appropriate identity: 104 x 96
4. Evaluate using the identity:
   (i) $15^3 - 10^3 - 5^3$.
   (ii) 99^3

8. INCLUSIVE PRACTIC AND FULL PARTICIPATION :-

Due to various social backgrounds and multiple intelligences, the classroom might be a diverse arena. The following techniques can be used for various groups:

For gifted students:

- Encouragement for referring other resources

For weak students:

- Buddy help to be provided
- Provide grade-up classes

Class IX

Subject: Mathematics

Chapter: 3

Topic: Coordinate Geometry

No. Of Days: 3

1. P.K. Testing :-

1. Basic knowledge of x-axis and y-axis.
2. Knowledge of how to locate a point.

2. LEARNING OUTCOME :-

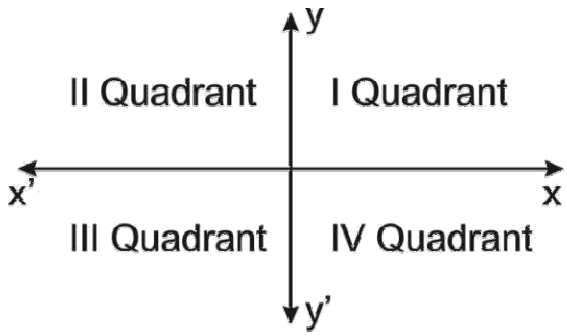
Students will develop the ability to understand
1. The Cartesian/co-ordinate plane.
2. The co-ordinate axes.
3. The quadrants and the sign of the co-ordinates of a point in different quadrants.
4. The meaning of origin.

3. PEDAGOGICAL STRATEGIES :-

The class will start with a discussion on what the students have already learnt in the previous classes and hence what is it that they will learn now. They will also be told the significance of the topic that they will be studying.

4. ART INTEGRATION :-

Graph Sheets, Audio Visual aids



5. LIFE SKILL :-

Students will be able to

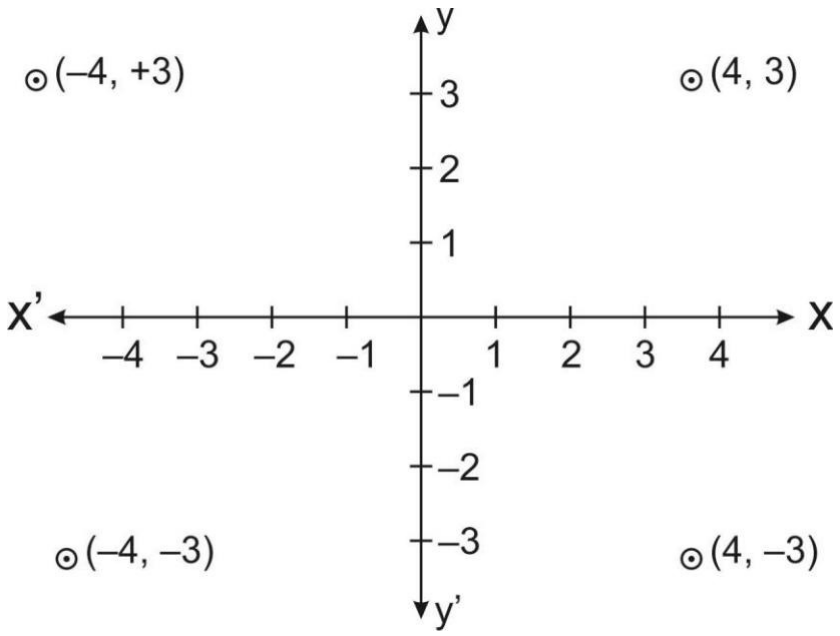
1. Locate and analyze the quadrant in which the given point lies.
2. Write the co-ordinates of the given point.
3. Plot a point if the x-axis and y-axis co-ordinate points are given, develop critical thinking and collaboration in the process.

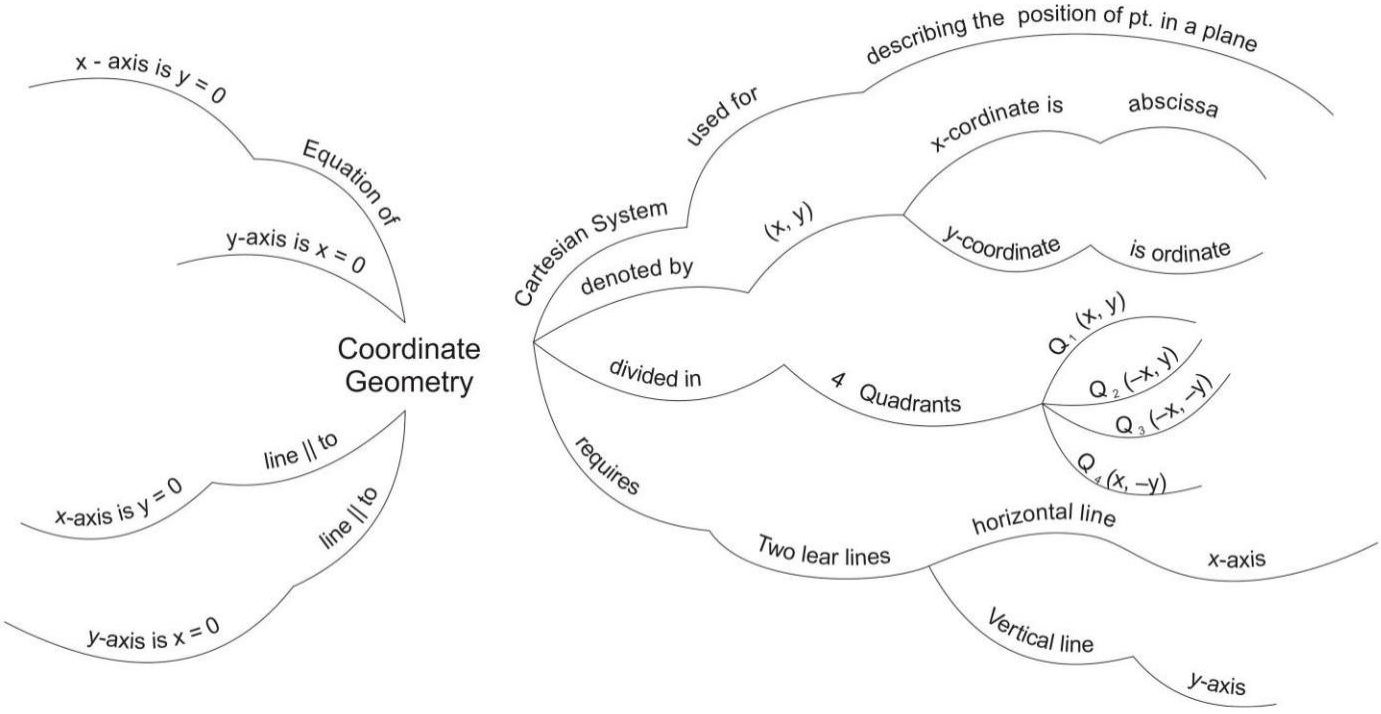
6. FEEDBACK AND REMEDIAL TEACHING RECAPITULATION:-

The system of used for describing the position of a point in a plane is called Cartesian system. Developed by the French Mathematician Rene Descartes denoted by (x, y)

Fixed point is origin (0, 0), left of origin (–x, 0) is negative x-axis, right of origin is (x, 0), +ve x-axis, top of origin (0, y) is +ve y-axis and bottom of origin (0, –y) is –ve y-axis Cartesian Plane is divided into 4 parts known as quadrants.

The x-coordinate is called abscissa The y-coordinate is called ordinate





7. ASSESSMENT

ASSIGNMENTS **:-**

1. What is the ordinate of all points on x-axis?
2. The perpendicular distances of a point from x axis and y axis are 3 and 4 respectively. What are its coordinates?
3. In which quadrant or on which axis each of the points lie? A (8, –3), B (5, 2), C (7, –1)
4. Write the coordinates of the following: 4 units right to the origin and 3 units below origin.

8. INCLUSIVE PRACTIC AND FULL PARTICIPATION :-

The following techniques can be used for various groups:
For gifted students:
- Encouragement for referring other resources

For weak students:
- Buddy help to be provided
- Provide grade-up classes

Class IX

Subject : Mathematics

Chapter : 4

Topic: Linear Equations in Two Variables

No. Of Days: 4

1. P.K. TESTING :-

(i) Define Linear Equations

(ii) Find out the solution for a linear Equation in one variable eg. $2x + 4 = 0$

2. LEARNING OUTCOME :-

Students would be able to:

(i) Understand standard form of a linear equation and write the values of a ,b and c.

(ii) To introduce the equation in two variables.

(iii) To focus on linear equations of the type $ax + by + c = 0$.

(iv) Explain that a linear equation in two variables has infinitely many solutions and justify their being written as ordered pairs of real numbers.

3. PEDAGOGICAL STRATEGIES :-

Inductive Deductive Reasoning, Graphic Organizers, Think pair, share

4. ART INTEGRATION :-

Representation of graphs, audio-video aids

5. LIFE SKILL :-

Students would be able to critically apply the concepts in given situations and collaboratively solve daily life problem based on the concept.

6. FEEDBACK AND REMEDIAL TEACHING RECAPITULATION:-

- What is an equation?
- What is the meaning of coefficient?
- What do you mean by linear?

Students will be asked to write different equation in one or two variables.

7. ASSESSMENT

ASSIGNMENTS**:-**

1. Find two solution of $x+2y = 10$.
2. Write four solutions of $5x + 2y - 7 = 0$.
3. Find the value of a if (-1, 1) is a solution of the equation $3x - ay = -7$.

8. INCLUSIVE PRACTICE AND FULL PARTICIPATION :-

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For gifted students:

- Encouragement for referring other resources

For weak students:

- Buddy help to be provided
- Provide grade-up classes

Class IX

Subject : Mathematics

Chapter : 5

Topic : Introduction to Euclid's Geometry

No. Of Days : 3

1. P.K. TESTING :-

This lesson requires basic knowledge of

1. Basic knowledge of the word Geometry
2. Knowledge of basic term used in geometry e.g. point, line, straight line, surface, plane surface

2. LEARNING OUTCOME :-

Students would be able to:

1. Euclid’s Geometry.
2. Euclid’s axioms and postulates.
3. Different axioms and postulates and it’s applications in various geometrical concepts.
4. Non Euclidean Geometry

3. PEDAGOGICAL STRATEGIES :-

Use of audio video Inductive Deductive Reasoning, Think pair, share.

4. ART INTEGRATION :-

Audio-Video Aids

5. LIFE SKILL :-

1. Analyse and apply Euclid's postulates/axioms to solve simple geometrical problems.
2. Prove some more results by critically applying deductive reasoning.

6. FEEDBACK AND REMEDIAL TEACHING RECAPITULATION:-

Students would be able to

1. Appreciate the contribution of Great Mathematician like Euclid, Thales and Pythagoras in Geometry
2. Comprehend the basic Geometrical terms e.g. point, line, surface, defined by Euclid.
3. Differentiate between postulates and axioms
4. Understand seven axioms and five postulates
5. Understand the meaning of proportions theorems thereby inculcating competencies like collaboration, critical thinking and creativity.

7. ASSESSMENT

ASSIGNMENTS **:**

1. If AB = PQ and PQ=XY, then by which Euclid's axiom we can show that AB=XY.

2. By which axiom we can say that area of sector of a circle is always less than the area of the circle.
3. Write any four axioms of Euclid.

8. INCLUSIVE PRACTIC AND FULL PARTICIPATION :-

The following techniques can be used for various groups:
For gifted students:
- Encouragement for referring other resources

For weak students:
- Buddy help to be provided
- Provide grade-up classes

Class IX

Subject: Mathematics
Chapter: 6

Topic: Lines & Angles

No. Of Days: 4

1. P.K. TESTING :-

This lesson requires:

1. Basic knowledge of angles and types of angles.
2. Knowledge of linear pair of angles and parallel lines.

2. LEARNING OUTCOME:-

Students would be able to:

1. Intersecting lines and non-intersecting lines.
2. Pairs of angles.
3. Parallel lines and a transversal.
4. Lines parallel to the same line.
5. Solve and analyze geometrical problems
6. Solve problems related to adjacent angles and linear pair.
7. Use the concept of various angles formed when a transversal intersects 2 parallel lines and their properties

3. PEDAGOGICAL STRATEGIES :-

The class will start with a discussion on what the students have already learnt in the previous classes and hence what is it that they will learn now. They will also be told the significance of the topic that they would be studying.

4. ART INTEGRATION:-

Audio - Video aids and model.
To prepare ppt and chart

5. LIFE SKILL:-

Students will be able to identify the properties of the angles formed when 2 lines intersect each other and when a line intersects 2 or more parallel lines at distinct points. Students will also be able to use these properties to prove some statements, thereby inculcating competencies like collaboration, critical thinking and creativity

6. FEEDBACK AND REMEDIAL TEACHING RECAPITULATION:-

Recapitulation will be done

(i) Line is a collection of points.

(ii) A line has no end points

(iii) A line with two end points is line segment.

(iv) A line with one end point is a ray, denoted by

(v) If three or more than three points lying on the same line, then they are collinear points.

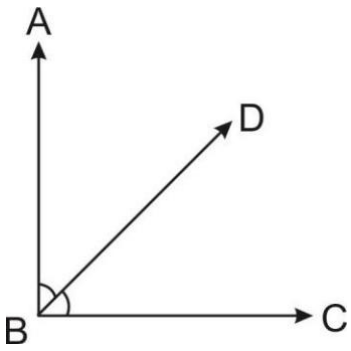
(vi) Any 3 non-collinear points form a triangle.

(vii) Angle is formed when two rays originate from the same end point, rays are called arms.

(viii) Two angles whose sum is 90º are called complementary.

(ix) Two angles whose sum is 180º are called supplementary.

(x) If 2 angles have common vertex and one common arm then they are adjacent



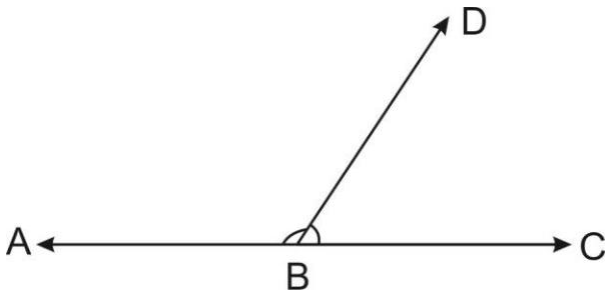
(xi) Sum of two adjacent angles is 180º then they are linear pair

(xii) Adjacent angles - ABD, DBC and

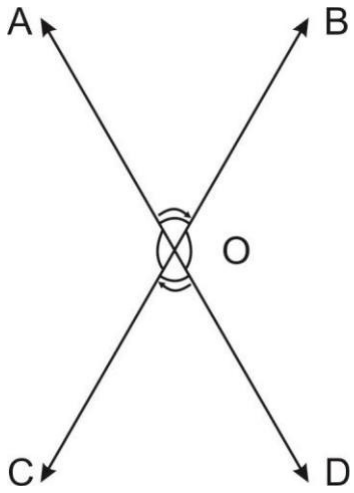
ABC ABD DBC

.

(xiii) If non common a arms from a straight line, ABD and DBC are called linear pair of angles.



(xiv) Vertically opposite Angles.



(xv) If a transversal intersect two parallel lines then

Each pair of corresponding angles is equal or each pair of alternate interior / exterior angles is equal any pair of interior angles on the same side of the transversal is supplementary then the lines are parallel.

7. ASSESSMENT

Techniques to be used:
Quiz
Daily Practice Problem
MCQ
Peer Assessment
Case Studies
Lab Activities

ASSIGNMENTS**:**

1. Two lines AB and CD intersect at O if $\angle AOC = 115°$, Find $\angle AOD$
2. The sum of two angles of a triangle is70° and their difference is 30°. Find all the angles of the triangle.
3. The supplement of an angle is one third of itself. Determine the angle and its supplement.

8. INCLUSIVE PRACTICE AND FULL PARTICIPATION :-

The following techniques can be used for various groups:
For gifted students:

- Encouragement for referring other resources

For weak students:

- Buddy help to be provided
- Provide grade-up classes

Class IX

Subject: Mathematics

Chapter: 7

Topic: Triangles

No. Of Days: 8

1. P.K. TESTING :-

This lesson requires

1. Basic knowledge of congruency and congruent figures.
2. Knowledge of various parts of a triangle.
3. Knowledge of types of triangles.
4. Knowledge of relation between exterior and interior of a triangle

2. LEARNING OUTCOME :-

1. Congruence of triangles.
2. Criteria for congruence of triangles.
3. Some properties of triangles.
4. Locate and identify the various criteria for the congruency.
5. Analyze the various criteria to check whether the given pair of triangles is congruent or not.
6. Use the rules of congruency in combination figures involving triangles.

3. PEDAGOGICAL STRATEGIES :-

Use of audio video Inductive Deductive Reasoning, Think pair, share.

4. ART INTEGRATION :-

To verify experimentally the different criteria for congruency of triangles using triangle cut outs.

5. LIFE SKILL :-

Students will know in detail about the congruence of triangles, will be able to identify the rules of congruence while proving the 2 triangles to be congruent, will learn more properties of triangles. Thereby inculcating competencies like collaboration, critical thinking and creativity

6. FEEDBACK AND REMEDIAL TEACHING RECAPITULATION:-

a) Two figures are congruent, (equal in all aspects i.e. shape, size etc), if they are of the same shape and of save size. e.g. circles of same radii, squares of same sides.

b) Concept of congruent triangles

c) Properties of triangles

7. ASSESSMENT

Techniques to be used:
Quiz
Daily Practice Problem
MCQ
Peer Assessment
Case Studies
Lab Activities

ASSIGNMENTS**:-**

1. In ΔPQR, $\angle Q = 40°$and PQ = PR. Find $\angle P$ and $\angle R$.
2. In triangle QSR sides SQ and RS are produced to points T and P resp. Such that $\angle TQR = 125°$ and $\angle PSQ = 100$ find $\angle SRQ$.
3. Prove that sides opposite to equal angles of triangle are equal.
4. Prove that the angles opposite to equal sides of triangle are equal.
5. PQR is a triangle in which PQ = PR and S is any point on the side PQ. Through S, a line is drawn parallel to QR and intersecting PR at T. Prove that PS = PT

8. INCLUSIVE PRACTIC AND FULL PARTICIPATION :-

The following techniques can be used for various groups:
For gifted students:

- Encouragement for referring other resources

For weak students:

- Buddy help to be provided
- Provide grade-up classes

Class IX
Chapter: 8
TOPIC- QUADRILATERALS

No. Of Days: 7

1. P.K. TESTING:

This lesson requires
1. Basic knowledge of polygon
2. Knowledge of various types of quadrilaterals
3. Congruence criteria of triangles
4. Knowledge of properties of different types of quadrilaterals.

2. LEARNING OUTCOME:

1. Properties of quadrilaterals
2. Criteria for proving parallelogram to a rectangle, square and rhombus.
3. Midpoint theorem and its applications.
4. Identify the criteria needed to prove a given quadrilateral a parallelogram, square, rectangle and rhombus.
5. Use the midpoint theorem to prove parallelogram

3. PEDAGOGICAL STRATEGIES :

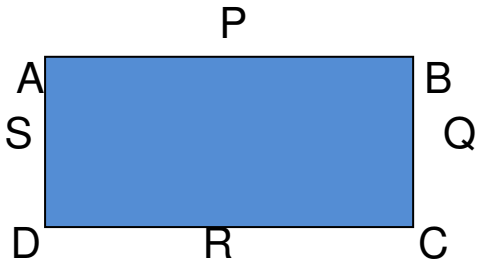
Teacher will ask the students to write different real life situations in which they see different types of parallelograms, define different types of parallelogram. The teacher will ensure that each learner is engaged.

4. ART INTEGRATION:-

Students will be explained that the figure obtained by joining the mid points of consecutives sides of a quadrilateral is a Parallelogram by paper folding method.

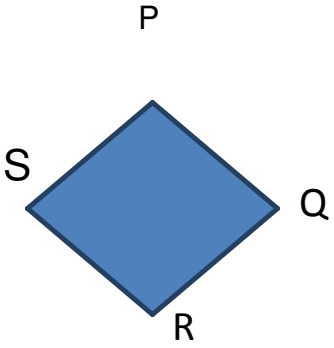
Cut off a quadrilateral ABCD from a coloured piece of paper.

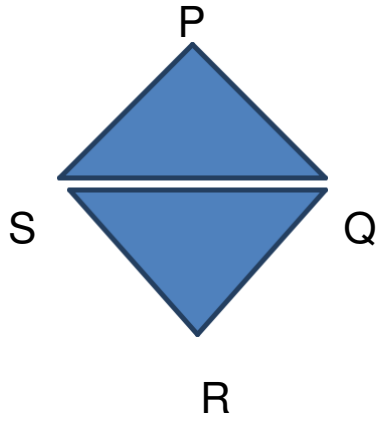
2. Mark the points P, Q, R and S of sides AB, BC, CD & DA respectively by folding appropriately.



3. Join PQ, QR, RS& SP.

4. Cut off quadrilateral PQRS.





5. Now, cut off the quadrilateral PQRS along the diagonal SQ into two triangles PSQ and SRQ.

6. Superimpose the triangle PSQ on triangle RQS such that PQ falls on SR.

This implies that the triangle PSQ superimpose the triangle RQS exactly. Thus SP=QR and RS= PQ. This shows that PQRS is a Parallelogram.

5. LIFE SKILL:

Students will know in detail about the properties of quadrilaterals, will know how to prove a given parallelograma rectangle ,rhombus or square. Studentswill verify midpoint theorem through lab activity thereby incorporating competencies like collaboration ,critical thinking.

6. FEEDBACK AND REMEDIAL TEACHING RECAPITULATION:-

(A) A diagonal of a parallelogram divides it into two congruent triangle.

(B) In a parallelogram:-

(i) Opposite sides are equal.

(ii) Opposite angles are equal.

(iii) Diagonals bisect each other.

(C) A quadrilateral is a parallelogram if:-

(i) Opposite sides are equal.

(ii) Opposite angles are equal.

(iii) Diagonals bisect each other.

(iv) A pair of opposite sides is equal and parallel.

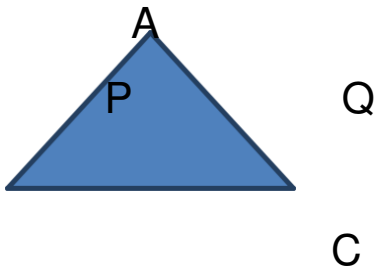
(D) Diagonals of a rectangle bisect each other and are equal & vice versa.

(E) Diagonals of a rhombus bisect each other at right angles and vice versa.

(F) Diagonals of a square bisect each other at right angles and are equal.

(G) Midpoint Theoram: The line joining the mid points of any two sides of a triangle is parallel to the third sides and is equal to half of it.

In triangle ABC, P and Q are the mid points of AB & AC respectively. Then PQ// BC and PQ=1/2 BC.



Converse of Midpoint Theorem

A line through the midpoint of side of a triangle parallel to another side bisects the third side.

The quadrilateral formed by joining the mid points of sides of a quadrilateral, in order, is a parallelogram.

Questions based on above theorem will be explained and will be discussed with the help of smart class.

Students will be asked following questions.

(1) What is a quadrilateral ?.

(2) Define Parallelogram.

(3) Are the opposite sides of a Parallelogram equal.

(4) Each angle of a rectangle is of _____.

7. ASSESSMENT

Techniques to be used:
Quiz
Daily Practice Problem
MCQ
Peer Assessment
Case Studies
Lab Activities

ASSIGNMENTS **:**

The following questions will be given as home assignment:-

Q1. Show that line joining the mid points of opposite sides of a quadrilateral bisect each other.

Q2. In trapezium ABCD, AB//CD and AD=BC.

Show that:

(i) Angle A = Angle B.

(ii) Angle C = Angle D

(iii). ▲ABC = ▲ BAD

(iv) Diagonal AC = Diagonal BD.

Q3. Show that diagonals of a rhombus are perpendicular to each other.

8. INCLUSIVE PRACTICE AND FULL PARTICIPATION :-

Due to various social backgrounds and multiple intelligences, the classroom might be a diverse arena. The following techniques can be used for various groups:
For gifted students:
- Encouragement for referring other resources

For weak students:
- Spiral Level 1 to be completed
- Buddy help to be provided
- Provide grade-up classes

Class IX

Subject: Mathematics
Chapter: 9

Topic: Circles

No. Of Days: 8

1. P.K. TESTING :-

This lesson requires
1. Basic knowledge of terms related to circles.
2. Knowledge of congruent figures.
3. Knowledge of basic geometrical terms like perpendicular.

2. LEARNING OUTCOME :-

1. Understand the concept of Circles and its related terms.
2. Understand angle subtended by a chord, at any point on the circle.
3. Understand and apply the concept of cyclic quadrilateral.
4. Understand and apply the theorems based on circles.
5. Develop the ability to understand and apply the properties of circles and circular regions.

3. PEDAGOGICAL STRATEGIES :-

1. Develop the ability to find unknown angles using different properties of circles.

2. Solve real life situation base questions such question on David, syed and Ankur and develop critical thinking and collaboration in the process.

4. ART INTEGRATION :-

Activity : Verify that angle at centre of a circle is double the angle at any point on the remaining part of circle.

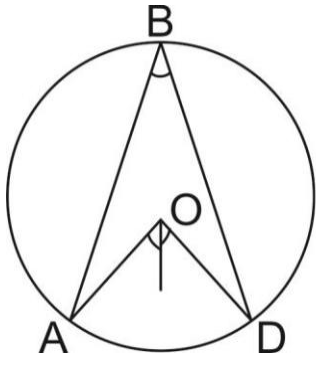
Material required : Wooden board, green, nails, thread, cutter, glazed paper etc.

(i) Cut a circle of radius 10cm from card board and paste glaze paper on it.

(ii) Mark centre O and angles ABD and AOD on the circle.

(iii) Cut two angles equal to angle ABD of same size.

(iv) Place both of those angle along the angle AOD.



(v) Both these angles exactly cover the angle AOD.

It shows angle at the centre of circle is double

(vi) the angle at any point on the remaining part of the circle.

5. LIFE SKILL :- Students will be asked to do the following activities.

(i) Find out about sector and segment related to a circle and share findings with the class.

(ii) Find out why all celestial bodies (except asteroids) are spherical in shape.

6. FEEDBACK AND REMEDIAL TEACHING RECAPITULATION:-

After studying the lesson, students will be able to explain all the terms related to circle. They will also be able to prove various theorems of circles.

(i) In a circle equal chords Subtend equal angles at the centre and vice versa.

(ii) The perpendicular from the centre of a circle. to a chord bisects the chord.

(iii) Equal chords of a circle are equidistant from the centre and vice versa.

(v) Congruent arcs of a circle subtend equal angles at the centre.

(vi) The sum of either pair of opposite angles of a cyclic quadrilateral is 180.

7. ASSESSMENT

Class Test, work sheets will be given

ASSIGNMENTS **:-**

1) Prove that equal chords of the circle subtend equal angle at the centre.
2) A chord of a circle is equal to radius of the circle find angle subtended by the chord at a point on minor arc and at a point on major arc.

9. INCLUSIVE PRACTIC AND FULL PARTICIPATION :-

Due to various social backgrounds and multiple intelligences, the classroom might be a diverse arena. The following techniques can be used for various groups:
For gifted students:
•Encouragement for referring other resources
For weak students:
•Buddy help to be provided
•Provide grade-up classes

Class IX
Subject: Mathematics

Chapter: 10

Topic: Heron's Formula

No. Of Days : 2

1. P.K. TESTING:-

(i) Define right angled triangle. Define an equilateral triangle.

(ii) What is area of a right angled triangle?

(iii) What is area of an equilateral triangle?

2. LEARNING OUTCOME :-

1. The formula for calculating area of an equilateral triangle, right angled triangle.
2. Use Heron's formula for calculation the area of a triangle whose all the three sides are given.
3. Find the area of the given triangles easily by using the learnt formulas.
4. Use Heron's formula efficiently and thus would be able to find the area of a triangle whose three sides would be given.

3. PEDAGOGICAL STRATEGIES :-

Develop the ability to find area of triangle when its base and height are given.

The teacher will ask the student to relate these concept in solving questions

4. ART INTEGRATION :-

The students will be asked to derive the formulae for a area of equivalent triangle whose side is a.

5. LIFE SKILL :-

Student will be able to analyse and to relate the topic with real life situation like plots and agriculture land, flyover

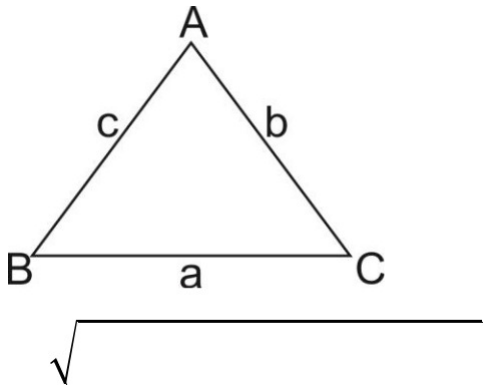
6. FEEDBACK AND REMEDIAL TEACHING RECAPITULATION:-

Area of right triangle $= \frac{1}{2}$ base height

Area of an equilateral triangle $= \frac{\sqrt{3}}{4} s^2$

s = semi perimeter $= \frac{a \quad b \quad c}{2}$

or s $\frac{p}{2}$



$$\sqrt{\quad}$$

Area of ABC $= \sqrt{s\,(s-a)\,(s-b)\,(s-c)}$

(i) Dimensions of all sides will be given and one can find area of triangle using Heron's formula.

(ii) In case ratio of all sides given, then find all sides first, hence find of using Heron's formula.

7. ASSESSMENT

Techniques to be used:
Quiz
Daily Practice Problem
MCQ
Peer Assessment
Case Studies
Lab Activities

ASSIGNMENTS **:-**

1. Three side of a triangle are in the ratio 3:4:5 and its perimeter is 360 meter find all the sides.
2. Find area of a equilateral triangle whose side is 12cm.

8. INCLUSIVE PRACTICE AND FULL PARTICIPATION :-

The following techniques can be used for various groups:

For gifted students:

- Encouragement for referring other resources

For weak students:

- Peer help to be provided
- Provide grade-up classes

Class IX

Subject: Mathematics

Chapter : 11

Topic: Surface area and Volumes

No. Of Days: 9

1. P.K. TESTING :-

1. Basic knowledge of triangles and circles.
2. Knowledge of square, rectangle, parallelograms and solid figures.
3. Knowledge of calculating perimeter and area of square and rectangles

2. LEARNING OUTCOME :-

1. Total surface area and curved surface area of cone, hemisphere and sphere.
2. Volume of cone, hemisphere and sphere.
3. Solve questions based on the topics like area and volume of cone, hemisphere and sphere.
4. Use analytical skills to visualize the given scenario and use the concepts learnt in everyday problems.
5. Use synthetic skills to solve problems.

3. PEDAGOGICAL STRATEGIES :-

The teacher will discuss regarding what the students have already learnt in the previous classes and hence what is it that they would learn now. They would also be told the significance of the topic that they would be studying.

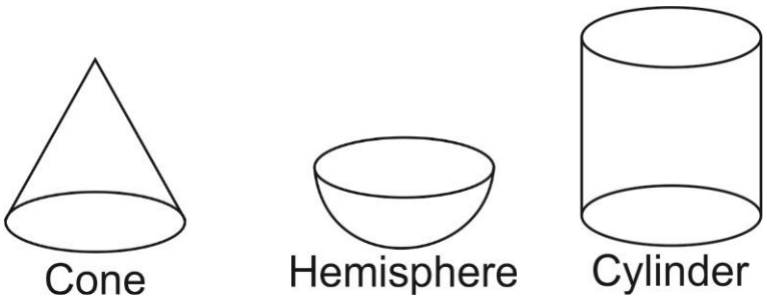
4. ART INTEGRATION :-

Activity: Verify volume relationship among right circular cone, a hemisphere and right circular cylinder of same height h and same radius r.

Material Required :-

Card Board, Scissors, Cutter, Gum, Plastic sheet, plastic ball, scale, and geometry box.

Procedure:-



(i) Take a plastic sheet and cut it to get a right circular cone of radius 30cm and height 30cm.

(ii) Take a plastic ball of radius 30cm and cut this into two halves so as to get a hemisphere.

(iii) Similarly take a plastic sheet and cut it to get a right circular cylinder of radius 30cm and height 30cm.

(iv) Fill the cone with sand and pour it twice into hemisphere. Hemisphere is completely filled with sand.

(v) Fill the cone with sand and pour it twice into cylinder. Cylinder is completely filled with sand.

By verifying volume relationship among right circular cone, a hemisphere and right circular cylinder of same heights and same radius we found, it is given by 1 : 2 : 3.

Mathematically, we have

Volume of right circulars cone	:	volume of hemisphere	:	volume of circular cylinder.
$\frac{1}{3}r^2h$	:	$\frac{2}{3}r^3$	:	r^2h

Putting r = 30 ; h = 30

$\frac{1}{3}30$ ^{2} 30	:	$\frac{2}{3}30^3$	:	30^2 30
10	:	2	:	3
1	:	1	:	3

5. LIFE SKILL :-

Students will be able to find

- Surface area of a right circular cone,
- Surface area of a sphere and hemisphere.
- Volume of right circular cone,
- Volume of sphere,
- Volume of hemisphere, thereby inculcating competencies like collaboration, critical thinking and creativity

6. FEEDBACK AND REMEDIAL TEACHING RECAPITULATION:-

All formulas of surface areas and volumes will be revised completely.

Learners will be able to calculate surface areas and volume of different solids such as cones, spheres and hemisphere.

7. ASSESSMENT

1. Class test
2. Extra sums from refreshers.

ASSIGNMENTS**:-**

1. A right triangle of side 5, 12 and 13 cm revolved about side 5cm find the volume of solid so obtained.
2. The diameter of moon is 1/4th the diameter of earth find ratio in there surface area as well as volume.

9. INCLUSIVE PRACTICE AND FULL PARTICIPATION :-

The following techniques can be used for various groups:
For gifted students:

- Encouragement for referring other resources

For weak students:

- Peer help to be provided
- Provide grade-up classes

Class IX

Subject: Mathematics

Chapter: 12

Topic: Statistics

No. Of Days: 4

1. P.K. TESTING :-

(i) Define data, range.

2. LEARNING OUTCOME :-

1. Collect data.
2. Present data.
3. Graphical representation of data-bar graph, Histogram with varying base lengths, frequency polygon.

3. PEDAGOGICAL STRATEGIES :-

The teacher will enhance

1) Representation skill while drawing Histogram

2) Procedural thinking

3) Communicating using mathematical terminology

4) Visual and spatial ability.

5) Strategic thinking.

4. ART INTEGRATION :-

Activity: Collect the data of temperature of 5 different cities of India and represent it in the form of bar graph

5. LIFE SKILL :-

1. Critical Thinking and Problem Solving : - Effectively analyzes and evaluates major alternative points of view, Effectively identifies and ask significant questions that clarify various points of view and leads to better solutions (Makes judgments and decisions, solve problems)

2. In this lesson, learners will collect the data from daily life and then represent the data the form bar graph histogram and frequency polygon after analysing the situation.

6. FEEDBACK AND REMEDIAL TEACHING RECAPITULATION:-

Students will recall the concepts to students to understand the term statistics and the need of collection of data, to develop the skill of representing data graphically as bar graph, histogram, frequency polygon. And to apply

the knowledge in solving the problems, thereby inculcating competencies like communication, character, collaboration, critical thinking, citizenship and creativity

7. ASSESSMENT

Techniques to be used:
Quiz
Daily Practice Problem
MCQ
Peer Assessment
Case Studies
Lab Activities

ASSIGNMENTS**:-**

Questions from NCERT and NCERT exemplars will be given.

8. INCLUSIVE PRACTIC AND FULL PARTICIPATION :-

The following techniques can be used for various groups:

- Encouragement for referring other resources
- Peer help to be provided
- Provide grade-up classes
- Encourage and motivate the students