

Outline of class 9<sup>th</sup> (Mathematics)

<u>TOPIC</u>	<u>LEARNING OUTCOMES</u>	<u>INNOVATIVE / ART INTEGRATION / EXPERIENTIAL LEARNING / INTER DISCIPLINARY</u>
<p><u>Chapter 1:</u> Number System</p>	<p><u>Students would be able to:</u></p> <ol style="list-style-type: none"> <li>1. Natural numbers, whole numbers, integers, rational and irrational numbers.</li> <li>2. The method of plotting square root of natural and decimal numbers on the number line.</li> <li>3. The laws of exponents.</li> <li>4. Develop the ability to analyze and differentiate between various types of numbers.</li> <li>5. Perform numerical skills like rationalization techniques on irrational numbers.</li> <li>6. Recall of laws of exponents with integral powers, rational exponents with positive real bases.</li> </ol>	<p><u>Art Integration:</u> Figures and computer.</p> <p><u>Experiential learning:</u> To construct square root spiral with coloured paper</p>
<p><u>Chapter 2:</u> Polynomials</p>	<p><u>Students will be able to:</u></p> <ol style="list-style-type: none"> <li>1. Classify the polynomials among the algebraic expressions.</li> <li>2. Understand the degree, Zero of the polynomial and factor theorems.</li> <li>3. Recall of algebraic expressions and identities.</li> </ol>	<p><u>Innovative methods:</u> Using coloured papers, To verify identity <math>(a+b+c)^2 = a^2 + b^2 + c^2 + 2ab + 2bc + 2ca</math>.</p> <p><u>Art Integration:</u> Figures and computer.</p>
<p><u>Chapter 3:</u> Coordinate Geometry</p>	<p><u>Students will be able to:</u></p> <ol style="list-style-type: none"> <li>1. The Cartesian / co-ordinate plane.</li> <li>2. The co-ordinate axes.</li> <li>3. The quadrants and the sign of the co-ordinates of a point in different quadrants.</li> <li>4. The meaning of origin.</li> <li>5. Plot the points in the Cartesian plane if the co-ordinates are given.</li> <li>6. Locate and analyze the quadrant in which the given point lies.</li> <li>7. Write the co-ordinates of the given point.</li> <li>8. Plot a point if the x-axis and y-axis co-ordinate points are given, develop critical thinking and</li> </ol>	<p><u>Art Integration:</u> Figures and computer.</p> <p><u>Experiential learning:</u> Geo board as a tool can be used for Coordinate geometry.</p>

## Outline of class 9<sup>th</sup> (Mathematics)

	<b>collaboration in the process.</b>	
<p><b><u>Chapter 4:</u></b></p> <p>Linear equations in two variables.</p>	<p><b><u>Students would be able to:</u></b></p> <ol style="list-style-type: none"><li>1. Understand standard form of a linear equation and write the values of a ,b and c.</li><li>2. To Introduce the equation in two variables.</li><li>3. To focus on linear equations of the type <math>ax + by + c = 0</math>.</li><li>4. Explain that a linear equation in two variables has infinitely many solutions and justify their being written as ordered pairs of real numbers.</li></ol>	<p><b><u>Innovative methods:</u></b></p> <p>Smart class modules.</p> <p><b><u>Art Integration:</u></b></p> <p>Figures and computer.</p>
<p><b><u>Chapter 5:</u></b></p> <p>Introduction to Euclid's Geometry</p>	<p><b><u>Students would be able to:</u></b></p> <ol style="list-style-type: none"><li>1. Euclid's Geometry.</li><li>2. Euclid's axioms and postulates.</li><li>3. Different axioms and postulates and it's applications in various geometrical concepts.</li><li>4. Non Euclidean Geometry.</li></ol>	<p><b><u>Innovative methods</u></b></p> <p>Understanding of various axioms using daily life examples</p> <p><b><u>Art Integration:</u></b></p> <p>Figures and computer.</p>

## Outline of class 9<sup>th</sup> (Mathematics)

<p><b><u>Chapter 6:</u></b></p> <p>Lines and Angles</p>	<p><b><u>Students would be able to:</u></b></p> <ol style="list-style-type: none"> <li>1. Intersecting lines and non-intersecting lines.</li> <li>2. Pairs of angles.</li> <li>3. Parallel lines and a transversal.</li> <li>4. Lines parallel to the same line.</li> <li>5. Solve and analyze geometrical problems</li> <li>6. Solve problems related to adjacent angles and linear pair.</li> <li>7. Use the concept of various angles formed when a transversal intersects 2 parallel lines and their properties.</li> </ol>	<p><b><u>Innovative methods:</u></b></p> <p>To prove that vertically opposite angles are equal using cutting pasting methods</p> <p><b><u>Art Integration:</u></b></p> <p>Figures and smart class.</p> <p><b><u>Experiential learning:</u></b></p> <p>Student will use analytical skills to visualize the given scenario and use the concepts learnt in everyday problems.</p>
<p><b><u>Chapter 7:</u></b></p> <p>Triangles</p>	<p><b><u>Students would be able to:</u></b></p> <ol style="list-style-type: none"> <li>1. Congruence of triangles.</li> <li>2. Criteria for congruence of triangles.</li> <li>3. Some properties of triangles.</li> <li>4. Locate and identify the various criteria for the congruency.</li> <li>5. Analyze the various criteria to check whether the given pair of triangles is congruent or not.</li> <li>6. Use the rules of congruency in combination figures involving triangles.</li> </ol>	<p><b><u>Art Integration:</u></b></p> <p>Figures and computer.</p> <p><b><u>Experiential learning:</u></b></p> <p>Student will use the property of triangles to solve geometrical problems thus, develop critical thinking and collaboration in the process</p>
<p><b><u>Chapter 8:</u></b></p> <p>Quadrilateral</p>	<p><b><u>Students would be able to:</u></b></p> <ol style="list-style-type: none"> <li>1. Properties of quadrilaterals</li> <li>2. Criteria for proving parallelogram to a rectangle, square and rhombus.</li> <li>3. Mid point theorem and its applications.</li> <li>4. Identify the criteria needed to prove a given quadrilateral a parallelogram, square, rectangle and rhombus.</li> </ol>	<p><b><u>Art Integration:</u></b></p> <p>Figures and computer.</p> <p><b><u>Experiential learning:</u></b></p> <p>To verify mid point theorem through paper cutting and pasting</p>

## Outline of class 9<sup>th</sup> (Mathematics)

	5. Use the mid point theorem to prove parallelogram	method.
<p><b><u>Chapter 9:</u></b></p> <p>Circles</p>	<p><b><u>Students would be able to:</u></b></p> <ol style="list-style-type: none"> <li>1. Understand the concept of Circles and its related terms.</li> <li>2. Understand angle subtended by a chord, at any point on the circle.</li> <li>3. Understand and apply the concept of cyclic quadrilateral.</li> <li>4. Understand and apply the theorems based on circles.</li> <li>5. Develop the ability to understand and apply the properties of circles and circular regions.</li> </ol>	<p><b><u>Art Integration:</u></b></p> <p>Figures and computer.</p> <p><b><u>Experiential learning:</u></b></p> <p>Apply the knowledge of circles in making drawings, model making, projects etc</p>
<p><b><u>Chapter 10:</u></b></p> <p>Heron's Formula</p>	<p><b><u>Students would be able to:</u></b></p> <ol style="list-style-type: none"> <li>1. The formula for calculating area of an equilateral triangle, right angled triangle.</li> <li>2. Use Heron's formula for calculation the area of a triangle whose all the three sides are given.</li> <li>3. Find the area of the given triangles easily by using the learnt formulas.</li> <li>4. Use Heron's formula efficiently and thus would be able to find the area of a triangle whose three sides would be given.</li> </ol>	<p><b><u>Innovative methods:</u></b></p> <p>Apply Heron's formula in solving day to day real life problems by critical thinking.</p> <p><b><u>Art Integration:</u></b></p> <p>Figures and computer.</p>
<p><b><u>Chapter 11:</u></b></p> <p>Surface Areas And Volumes</p>	<p><b><u>Students would be able to:</u></b></p> <ol style="list-style-type: none"> <li>1. Total surface area and curved surface area of cone, hemisphere and sphere.</li> <li>2. Volume of cone, hemisphere and sphere.</li> <li>3. Solve questions based on the topics like area and volume of cone, hemisphere and sphere.</li> <li>4. Use analytical skills to visualize the given scenario and use the concepts learnt in everyday problems.</li> <li>5. Use synthetic skills to solve problems.</li> </ol>	<p><b><u>Innovative methods:</u></b></p> <p>To find volume of rubber ball and plastic ball.</p> <p><b><u>Art Integration:</u></b></p> <p>Figures and computer.</p> <p><b><u>Experiential learning:</u></b></p> <p>Use of volume and surface areas in solving practical problems.</p>

## Outline of class 9<sup>th</sup> (Mathematics)

<p><b><u>Chapter 12:</u></b></p> <p>Statistics</p>	<p><b><u>Students would be able to:</u></b></p> <ol style="list-style-type: none"><li>1. Collect data.</li><li>2. Present data.</li><li>3. Graphical representation of data-bar graph, Histogram with varying base lengths, frequency polygon.</li></ol>	<p><b><u>Innovative methods:</u></b></p> <p>To collect data and plotting of histogram on practical based scenario.</p> <p><b><u>Art Integration:</u></b></p> <p>Figures and computer.</p> <p><b><u>Experiential learning:</u></b></p> <p>Analysis of comparison of performance of two teams through frequency polygon</p>
--	--	---