

CHOITHRAM SCHOOL, MANIK BAGH, INDORE
ANNUAL CURRICULUM PLAN SESSION 2017 – 2018

CLASS: IX

SUBJECT: MATHEMATICS

Month & Working Days	Theme/ Sub-theme	Learning Objectives		Activities & Resources	Expected Learning Outcomes	Assessment
		Subject Specific (Content Based)	Behavioural (Application based)			
Jun 10 days	Number system	Students will be able to 1) understand Irrational numbers, Real numbers and their decimal expansion 2) locate Real numbers on number line 3) perform operations on real numbers and use laws of exponents of real numbers	<ul style="list-style-type: none"> Students will attain the following behavioral objectives *They will appreciate the 'density property' of real numbers. *They can apply this thinking process in the real life situation that any particular solution may not be the final/only solution but there is a scope of improvement. *They can imagine any real number with accuracy. 	To make a spiral to represent real numbers from $\sqrt{1}$ to $\sqrt{17}$.	Students learned about <ul style="list-style-type: none"> Irrational numbers, Real numbers and their decimal expansion, location of Real numbers on number line, perform operations on real numbers and use laws of exponents of real numbers Students developed their imagination and accuracy with respect to the real numbers. 	Assessment will be done on the basis of decided rubrics.
Jun 5 days + July	Polynomials	Students will be able to 1) Understand the term	<ul style="list-style-type: none"> Students will apply regrouping/ 	To verify the Identity ($X + Y + Z$	Students learned about:	Assessment will be done

10days		<p>Polynomials, zeroes of a polynomial.</p> <p>2) Understand and apply Remainder theorem and factor theorem.</p> <p>3) To do factorization of polynomials.</p> <p>4) Understand and apply algebraic identities.</p>	<p>rearrangement method of factorization into real life situation to rearrange/ manipulate the available resources to obtain the desirable result/ outcome. They will also learn the method 'divide and conquer' of problem solving in the real life by factorization of a polynomial as they may apply any of the available methods or say that it cannot be factorized.</p>	<p>$(x+y+z)^2 = x^2 + y^2 + z^2 + 2xy + 2yz + 2zx$ by cutting and pasting method</p>	<ul style="list-style-type: none">Polynomials, zeroes of a polynomial, application of Remainder theorem and factor theorem, factorization of polynomials and the application of algebraic identities.Students learned about manipulation and strategies of problem solving.	<p>on the basis of decided rubrics</p>
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July 7 days	Coordinate geometry	<p>Students will be able to learn :</p> <ol style="list-style-type: none"> 1. The coordinate axes divide the plane into four parts called quadrants 2. The distance of a point from the y – axis is called its x – coordinate, or abscissa and the distance of the point from the x – axis is called y – coordinate, or ordinate 3. Locate the quadrant of a given point on the Cartesian plane. 4. Write the coordinates of the points marked on the Cartesian plane. 5. Plot a point on the Cartesian plane if its coordinates are given. 	<ol style="list-style-type: none"> 1. Appraise the use of Cartesian system in real life scenarios like designing 2 – d blue prints of home, offices etc. 2. Will develop the skills like precision and accuracy. 	To locate the position of self with respect to given assumed origin.(where class will be considered as Cartesian plane.	<p>Students learned about:</p> <ul style="list-style-type: none"> • Explain the concept behind Cartesian coordinate geometry. • Draw a plan for the given situation. • Identify the coordinates of a point from Cartesian plane. • Write the coordinates of points given on the Cartesian plane. • Plot points by referring to their coordinates on the Cartesian plane • Identify and locate the quadrants in the Cartesian plane. • Write the abscissa and ordinate of a point. • Calculate the unknown variable in the equation with the help of abscissa and ordinates of a point • Tabulate the coordinates for the given linear equation • Represent and find the solution of linear equation graphically • Write the equation of a line under different conditions. 	Assessment will be done on the basis of decided rubrics.
July 7days	Linear equations in two variable	<ul style="list-style-type: none"> • S Students will be able to comprehend *Concept of linear equation in two variables. 	<ol style="list-style-type: none"> 1. Analyze the different aspects of life as any problem has n number of solution. 2. Concept of linear 		<p>Students learned about:</p> <ul style="list-style-type: none"> • Write the standard form of linear equation in two variables. Understand the reason for infinite solutions of linear 	

		<ul style="list-style-type: none"> Identify the variables (dependent and independent), their coefficients and the constant terms in the equation. Finding possible values of the variables that satisfy the equation. Understanding graphical interpretation of linear equation. Write equation of x axis and y axis, Frame equation of line parallel to x axis and y axis. Understand that every point of the straight line graph is a solution of the linear equation. To frame the linear equation from word based problem and solving it. 	<p>equation in dealing day to day activities like comparing the cost, budgeting a party, making prediction for future and so on.</p> <p>3. Problem solving ability.</p>		<p>Students learned about:</p> <ul style="list-style-type: none"> Represent the linear equation graphically. Frame an equation of axis and line parallel to axis Understand that equation of the type $y=mx$ will always pass through the origin. Analyze that every solution of the linear equation is a point on the graph of the linear equation. Students will be able to develop understanding that life is full of variables, change in one variable (decision making) will affect the result of other Problem solving ability. Balance a situation. Before accepting or taking any decision he will be able to reason out. 	
Aug 7days	Euclid' Geometry	<p>Students will be able to</p> <ol style="list-style-type: none"> 1)understand Euclid's definitions. 2) Distinguish between axioms and postulates. 3)understand Equivalent version of Euclid's fifth postulates 	<p>Students will be able to define a term and design an algorithm to solve/ prove a problem from real life.</p>		<p>Students learned about:</p> <ul style="list-style-type: none"> Euclid's definitions, distinguishing between axioms and postulates and the equivalent version of Euclid's fifth postulate. Students learned to define a term and design an algorithm to solve/ 	

					prove a problem from real life.	
Aug 11 days	Lines Angles	<ol style="list-style-type: none"> 1. Explain the terms 'line', 'ray', 'line segment', 'collinear points', 'intersecting lines' and 'parallel lines' 2. Describe the different types of angles 3. Explain the terms 'adjacent angles', 'linear pair of angles', 'complementary angles', 'supplementary angles' and 'vertically opposite angles' 4. Prove that vertically opposite angles are equal 5. Describe the angles formed by a transversal 6. Explain the corresponding angles axiom 7. Prove that if a transversal intersects two parallel lines, then each pair of alternate interior angles is equal 8. Prove that if a transversal intersects two parallel lines, then each pair of interior angles on the same side 	<ol style="list-style-type: none"> 1. Students apply the concept of lines and angle in various sports like basketball, javelin throw etc. 2. Students also use the concept in various designs for their activities 3. Engineers and architects apply the properties of lines and angles while making designs or blueprints for buildings' 	To show by cutting and pasting method that if two parallel lines are intersected by transversal the pair alternate exterior angles are equal.	<p>Students learned about:</p> <ul style="list-style-type: none"> • To describe basic geometrical terms and definitions. • Identify linear pair of angles • Explain the linear pair axiom. • Prove that vertically opposite angles are equal • Identify the angles when a transversal intersects parallel lines • Apply the fact that if a transversal intersects two parallel lines then <ul style="list-style-type: none"> ○ Each pair of corresponding angle is equal ○ Each pair of alternate angle is equal ○ Each pair of interior angles on the same side of the transversal is supplementary • State and prove the angle sum property of a triangle • Solve exercises based on the different types of angles and the angles formed by a transversal on a pair of parallel and intersecting lines. • Show that the exterior angle of a triangle is equal to the sum of the 	Assessment will be done on the basis of decided rubrics

		<p>of the transversal is supplementary</p> <p>9. Prove that the lines which are parallel to the same line are parallel to each other</p> <p>10. Prove that the sum of three angles of a triangle is 180°</p>			two interior opposite angles	
Sep 12days	Triangles	<p>Students will be able to:</p> <ol style="list-style-type: none"> 1. Describe congruent triangles 2. List the four criteria for the congruence of triangles 3. Explain the Side-Angle-Side (SAS) congruence rule 4. Prove the Angle-Side-Angle (ASA) congruence rule 5. Prove the Side-Side-Side (SSS) congruence rule 6. Prove the Right Angle-Hypotenuse-Side (RHS) congruence rule 7. Explain the non-criteria for the congruence of triangles 8. Prove that the angles opposite to the equal sides of an isosceles triangle are equal 9. Prove that the sides 	<p>Students will come to know use of triangles in</p> <ol style="list-style-type: none"> 1. Architecture 2. Navigation 	To show that in a triangle longer side has greater angle opposite to it. (by cutting and pasting method.)	<p>Students learned about:</p> <ul style="list-style-type: none"> • 1 Describe congruent triangles • 2 Describe the criteria for their congruence. • 3. To apply the following congruence rules in solving the problems <ul style="list-style-type: none"> ▪ SAS congruence rule ▪ ASA congruence rule ▪ AAS congruence rule ▪ SSS congruence rule ▪ RHS congruence rule • 4. Analyze the properties of a triangle • Explain the non-criteria for the congruence of triangles. • 6. Examine the inequalities in a triangle 	Assessment will be done on the basis of decided rubrics

		<p>opposite to the equal angles of a triangle are equal</p> <p>10. Prove that if two sides of a triangle are unequal, then the angle opposite to the longer side is larger</p> <p>11. Prove that in any triangle, the side opposite to the larger angle is longer</p> <p>12. Prove that the sum of any two sides of a triangle is greater than the third side</p>				
Oct 5days +Nov 10 days	Quadrilaterals	<p>Students will be able to,</p> <ul style="list-style-type: none"> Describe the types of quadrilaterals and their properties. Prove the angle sum property of quadrilaterals. Describe the types of parallelogram and their properties. Prove that the diagonal of a parallelogram divides it into two congruent triangles. Prove that if each pair of opposite sides of a 	<p>:-After getting the concept of quadrilateral, the student will analyze the application of their properties in day to day life</p> <ul style="list-style-type: none"> Use to create floor plans for new building In graphic arts, sculpture, logo. Packaging, web designing. Square-like shapes are often used for uniformity: they are 	<p>Quadrilateral formed by joining the midpoints of adjacent sides of quadrilateral is a parallelogram by paper cutting and folding method.</p> <p>* Verification of midpoint theorem by paper folding method.(acute angle triangle, obtuse angle triangle and right angle triangle)(</p>	<ul style="list-style-type: none"> students would be able to, Describe the types of quadrilaterals and their properties. Prove the angle sum property of quadrilaterals. Describe the types of parallelogram and their properties. Prove that the diagonal of a parallelogram divides it into two congruent triangles. Prove that if each pair of opposite sides of a quadrilateral is equal then it is a parallelogram. 	Assessment will be done on the basis of decided rubrics

		<p>quadrilateral is equal then it is a parallelogram.</p> <ul style="list-style-type: none"> • Prove that if each pair of opposite angle of a quadrilateral is equal then it is a parallelogram. • Prove that if each pair of opposite sides of a quadrilateral is equal and parallel in a quadrilateral, then it is a parallelogram • Prove that if diagonals of a Quadrilateral bisect each other, then it is a parallelogram. • Prove the midpoint theorem and its converse. 	easy to tessellate, or pattern with.	practical)	<ul style="list-style-type: none"> • Prove that if each pair of opposite angle of a quadrilateral is equal then it is a parallelogram. • Prove that if each pair of opposite sides of a quadrilateral is equal and parallel in a quadrilateral, then it is a parallelogram • Prove that if diagonals of a Quadrilateral bisect each other, then it is a parallelogram. • Prove the midpoint theorem and its converse • By the application of the properties of quadrilateral in real life situation student would develop their reasoning, logical and application skill. 	
Nov 13 days	Area of Parallelogram & Triangle	<p>Students will be able to</p> <p>1) identify Figures on the same base and between the same parallels.</p> <p>2) learn and apply 'a diagonal of parallelogram divides it into two triangles of equal area'.</p> <p>3) learn the properties of Parallelograms on the same base and between the same parallels i.e.</p>	<ul style="list-style-type: none"> • They will be able to recognize equal areas of triangular and parallelogram shapes and compares the areas of triangles and parallelograms in certain conditions. 	<p>To show that diagonals of parallelogram divide it in to two triangles of equal area.</p> <p>(by cutting and pasting method) (practical)</p> <p>To verify that parallelograms on the same base and between the</p>	<ul style="list-style-type: none"> • Students learned and applied the areas of two parallelograms / triangles with common / equal base and between the same parallels are equal. Area of a triangle is half of area of parallelogram if they have common base and they lie between the same parallels. • Students developed the ability to recognize equal areas of 	Assessment will be done on the basis of decided rubrics

		<p>Parallelograms on the same base or equal base and between the same parallels are equal in area.</p> <p>4) Learn and apply “The area of parallelogram is the product of its base and the corresponding altitude”.</p> <p>5) Learn and apply ‘Parallelograms on equal bases and between the same parallels are equal in area’.</p> <p>6) Learn the properties of Triangles on the same base and between the same parallel lines i.e. ‘Two triangles on the same base (or equal bases) and between the same parallels are equal in area’.</p> <p>7) Apply the area of a trapezium is half the product of its height and the sum of the parallel sides.</p> <p>8)apply the triangles having equal areas and having one side of the triangle equal to corresponding side of the other, have their</p>		<p>parallels are equal in area.</p>	<p>triangular and parallelogram shapes and compares the areas of triangles and parallelograms in certain conditions.</p>	
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		corresponding altitudes equal.				
Dec 12days	Circles	<p>Students will be able to learn</p> <ol style="list-style-type: none"> 1) Circles and its related terms. 2) Understand angle subtended by a chord, at any point on the circle. 3) Understand the concept of cyclic quadrilateral. 4) Understand and verify the theorems based on circles. 	<ul style="list-style-type: none"> • Through this chapter students will attain following behavioral objectives through solving variety of problems. • They will be able to understand and apply the properties of circles and circular regions. 	<p>To show that the angle subtended by an arc at the centre is double the angle subtended by it at any point on the remaining part of the circle. (Practical)</p> <p>To verify that angle in same segment of a circle are equal.</p>	<ul style="list-style-type: none"> • Students have learnt and applied the theorems on circles and cyclic quadrilaterals. • Students developed the ability to understand and apply the properties of circles and circular regions. 	Assessment will be done on the basis of decided rubrics
Jan 7 days	Constructions	<p>Students will be able to construct the bisector of a line segment, to construct the bisector of a given angle, to construct the required angle, to construct a triangle with given conditions.</p>	<ul style="list-style-type: none"> • Through this chapter students will attain following behavioral objectives through solving variety of problems. • They will be able to construct angles, perpendicular bisector, angle 		<p>Students learned about:</p> <ul style="list-style-type: none"> • To construct the bisector of a line segment, to construct the bisector of a given angle, to construct the required angle, to construct a triangle with given conditions. • Students developed the ability to construct angle, perpendicular bisector, angle bisector and triangles using the ruler and compasses. 	

			bisector and triangles using ruler and compasses.			
Jan 13 days	Heron's formula	<p>Students will be able to</p> <ul style="list-style-type: none"> Recall the term triangles and area of triangles Recognize Heron's formula Identify the concept of Heron's formula Give illustrations for Heron's formula. Calculate the area of a triangle using Heron's formula. Calculate the area of a quadrilateral using Heron's formula. 	<p>Heron's formula can be used to measure the area of triangle whose sides are given, it can be used in our daily life in the following ways:-</p> <ul style="list-style-type: none"> To find the area of triangular park To find area of scalene triangle in which the height doesn't definitely exists To find area of flyover. To find the area of quadrilateral shaped field using heron's formula. It gives scope to student to think for alternative method. It gives practical approach and motivational spirit to students that nothing is 	To verify the Pythagoras theorem by Heron's formula	<p>Students learned about:</p> <ul style="list-style-type: none"> Recognize and apply the heron's formula to find the area of triangle and quadrilateral. Understand about the Heron's formula and its importance in mathematics through observation, discussion and analyzing. To prove Pythagoras theorem with the help of herons formula. To generalize the formula for the area of equilateral triangle with the help of herons formula.(teacher will assist them by explaining on the black board) students will be able to analyze and reason out the use of heron's formula in day to day life To find the area of triangular park To find area of flyover. To find the area of quadrilateral shaped field using heron's formula. It develops practical approach and motivational spirit to 	Assessment will be done on the basis of decided rubrics

			impossible in this world.		students that nothing is impossible in this world.	
Jan 6 days + Feb 10 days	Surface Area and Volume	Students will be able to understand and apply the surface areas and volumes of a Cuboid, cube, right circular cylinder, cone and sphere	<ul style="list-style-type: none"> Through this chapter students will attain following behavioral objectives through solving variety of problems. They will be able to calculate and compare the surface areas and volumes of solid shapes like cuboids, cubes, right circular cylinders, right circular cones, spheres and hemispheres. 	To derive the formula for CSA of cylinder	<ul style="list-style-type: none"> It will develop calculation a Students have understood and applied the surface areas and volumes of a Cuboid, cube, right circular cylinder, cone and sphere. Students developed the ability to calculate and compare the surface areas and volumes of solid shapes like cuboids, cubes, right circular cylinders, right circular cones, spheres and hemispheres. 	
Feb 11 days	Statistics	Analyze different types of data 2. Create a frequency distribution table to classify data 3. Draw a bar graph to depict the given data 4. Interpret data from the given bar graph 5. Draw a histogram to depict the given data	1. Student can find average of anything from real life situation like his/her result, average of monthly household expenses, run rate of any cricket match 2. Student become more arranged and		Students learned about: 1. Describe basic terms related to statistics. 2. The students will be able to use different techniques to collect and present the data. 3. Determine the range of continuous data. 4. Determine the mean of a grouped data.	

		6. Interpret the data represented in a histogram 7. Draw a frequency polygon with the help of a histogram 8. Calculate the mean of the given data 9. Calculate the mode of the given data 10. Calculate the median 11. Calculate the median of the data when the observations are in even number	systematic		5. Determine the median of a grouped data using formula 6. Identify modal-class of a grouped data. 7. Determine the mode of a grouped data. 8. Determine median of a grouped data using cumulative frequency graph. 9. Draw and interpret bar graph	
Feb 5 days	Probability	Students will be able to: 1. Define probability and experimental probability 2. List the practical applications of probability 3. Conduct experiments to measure probability 4. Define the terms 'experiment', 'trial', 'event' and 'outcome' 5. Calculate probability of an outcome in a given event	1. Students will learn idea of fair selection 2. When they repeat a particular activity in real life, <i>n</i> number of times they get more precise and accurate results	To understand the probability by the deck of playing cards and throwing the dice.	Students learned about: Distinguish certain from uncertain events <ul style="list-style-type: none"> Describe events as being more or less likely from experience Order events from least likely to most likely and justify their choice Use a scale from 0 to 1 to informally place everyday chance-related events Represent and interpret probabilities as fractions, decimals and percentages Represent the probability of an event as a fraction or decimal between 0 and 1 or as a percentage	

					<ul style="list-style-type: none">• List all possible outcomes for practical experiments such as rolling one die• Determine the probability of an event using the results of an experiment	
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