DELHI PUBLIC SCHOOL, PALI

CLASS: IX

ANNUAL CURRICULUM PLAN SESSION 2019-20

SUBJECT: MATHEMATICS

Month	Theme/ Sub-theme	Learning Objectives		Activities & Resources	Expected Learning Outcomes	Assessment
		Subject Specific (Content Based)	Behavioral (Application based)			
April	Number system	Students will be able to 1) understand Irrational numbers, Real numbers and their decimal expansion 2) locate Irrational numbers, Real numbers on number line 3) perform operations on real numbers and use laws of exponents of real numbers 4) learn the concept of rationalizing the denominator	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 square root spiral to represent real numbers from $\sqrt{1}$ to $\sqrt{17}$. (N.C.E.R.T)	Students would be able to 1) Understand Irrational numbers, Real numbers and their decimal expansion 2) Locate Irrational numbers, Real numbers on number line 3) Perform operations on real numbers and use laws of exponents of real numbers 4) Learn the concept of rationalizing the denominator 5) Develop their imagination and accuracy with respect to the real numbers. 6) Appreciate the 'density property' of real numbers.	Assessment will be done on the basis of decided rubrics.
May	Polynomials	Students will be able to : 1) Understand the term polynomials, terms related to polynomials, zeroes of a	Students will apply regrouping/ rearrangement method of	To verify the Identity $(A+B+C)^2 = A^2 + B^2 + C^2 + 2AB + 2BC + 2CA$ by cutting and pasting method	Students would be able to : 1) Understand the term Polynomials, terms related to polynomials, zeroes of a	Assessment will be done on the basis of decided rubrics

		polynomial. 2) Understand and apply Remainder theorem and factor theorem. 3) Do factorization of polynomials. 4) Understand and apply algebraic identities.	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.	(N.C.E.R.T) Activity to support learning – Explanation of Cubic Identity $(a + b)^3 = a^3 + 3a^2b + 3ab^2 + b^3$	polynomial. 2) Understand and apply Remainder theorem and factor theorem. 3) Do factorization of polynomials. 4) Understand and apply algebraic identities. 5) Manipulation and strategies of problem solving.	
July	Coordinate geometry	Students will be able to learn : 1. The coordinate axis divides the plane into four parts called quadrants. 2. The distance of a point from Y-axis is called its X-coordinate, or abscissa and the distance of the point from X-axis is called its Y-coordinate, or ordinate. 3. To locate the quadrant of a given point on the Cartesian plane. 4. To write the coordinates of the points marked on the Cartesian plane. 5. To plot a point on the	*Appraise the use of Cartesian system in real life scenarios like designing 2 – d blue prints of home, offices etc. *Will develop the skills like precision and accuracy.	Activity (to assess learning) To obtain the mirror image of a given geometrical figure with respect to x-axis and y-axis. Activity (to support learning) To locate the position of self with respect to given assumed origin. (where class will be considered as Cartesian plane).	Students would be able to learn: 1. The coordinate axis divides the plane into four parts called quadrants. 2. The distance of a point from Y-axis is called its X-coordinate, or abscissa and the distance of the point from X-axis is called its Y-coordinate, or ordinate. 3. To locate the quadrant of a given point on the Cartesian plane. 4. To write the coordinates of the points marked on the Cartesian plane.	Assessment will be done on the basis of decided rubrics.

		Cartesian plane if its coordinates are given.			5. To plot a point on the Cartesian plane if its coordinates are given. 6. To appraise the use of Cartesian system in real life scenarios like designing 2 – d blue prints of home, offices etc. 7. To develop the skills like precision and accuracy	
AUGUST –	Linear equations in two variable	Students will be able to : • Learn the concept of linear equation in two variables. • 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. • Learn 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	1. Analyze the different aspects of life as any problem has n number of solution. 2. Concept of linear equation in dealing day to day activities like comparing the cost, budgeting a party, making prediction for future and so on. 3. Problem solving ability.	*To obtain a linear equation and draw a graph which represent the linear equation.	Students would be able to : • Learn the concept of linear equation in two variables. • 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. • Learn 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	Assessment will be done on the basis of decided rubrics.

		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. .			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. • Analyze the different aspects of life as any problem has n number of solution. • Concept of linear equation in dealing day to day activities like comparing the cost, budgeting a party (Making prediction for future and so on). • Develop Problem solving ability.	
AUGUST –	Euclid' Geometry	Students will be able to: 1)understand Euclid's definitions. 2) Distinguish between axioms and postulates. 3)understand Equivalent version of Euclid's fifth postulates	Students will be able to define a term and design an algorithm to solve/ prove a problem from real life.		Students would be able to: 1) Understand Euclid's definitions. 2) Distinguish between axioms and postulates. 3)understand Equivalent version of Euclid's fifth postulates 4) Define a term and design an algorithm to solve/ prove a problem from real life.	
AUGUST –	Lines and Angles	Students will be able to: 1. Explain the terms 'line',	Students apply the concept of lines and	Activity (to introduce the	Students would be able to:- 1. Explain the terms 'line',	Assessment will be done on

SEPTEMBER		'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 of the transversal is supplementary 9. Prove that the lines which are parallel to the same line are parallel to each	angle in various sports like basketball, javelin throw etc. Students also use the concept in various designs for their activities Engineers and architects apply the properties of lines and angles while making designs or blueprints for buildings'	lesson) Students will be asked to draw a pair of intersecting lines and measure both pair of opposite angles. Activity (to support learning) If a transversal intersects two parallel lines, then verify that 1. The corresponding angles are equal. 2. The sum of two interior angles or co-interior angles is 180^0. 3. The alternate interior angles are equal.	'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 of the transversal is supplementary 9. Prove that the lines which are parallel to the	the basis of decided rubrics

		other 10. Prove that the sum of three angles of a triangle is 180^0			same line are parallel to each other 10. Prove that the sum of three angles of a triangle is 180^0 11. Apply the concept of lines and angle in various sports like basketball, javelin throw etc. 12. To use the concept in various designs for their activities 13. Apply the properties of lines and angles while making designs or blueprints for buildings'	
SEPTEMBER	Triangles	Students will be able to: 1. Describe congruent triangles 2. List the four criteria for the congruence of triangles 3. Understand and apply the Side-Angle-Side (SAS) congruence rule 4. Understand and apply the Angle-Side-Angle (ASA) congruence rule 5. Understand and apply the Side-Side-Side (SSS) congruence rule 6. Understand and apply the Right Angle-Hypotenuse-	Students will be able to understand the concept of congruency which will help them to plot figures of same shape and size.	Activity (to introduce the lesson) Activity will be based on figures whose measurement of sides will be given and students will identify the congruency between them. (NCERT TEXT BOOK) Activity (to support learning) Draw two triangles ABC and PQR such that AB = 2 cm, BC =4 cm and <ABC = 45^0 and PQ = 2	Students would be able to:- 1.Describe congruent triangles 2.List the four criteria for the congruence of triangles 3.Understand and apply the Side-Angle-Side (SAS) congruence rule 4.Understand and apply the Angle-Side-Angle (ASA) congruence rule 5.Understand and apply the Side-Side-Side (SSS) congruence rule 6.Understand and apply the Right Angle-Hypotenuse-Side (RHS) congruence rule 7.Understand corresponding	Assessment will be done on the basis of decided rubrics

		Side (RHS) congruence rule 7. Understand corresponding parts of congruent triangles(CPCT). 8. Explain the non-criteria for the congruence of triangles 9. Prove that the angles opposite to the equal sides of an isosceles triangle are equal 10. Prove that the sides opposite to the equal angles of a triangle are equal 11. Prove that if two sides of a triangle are unequal, then the angle opposite to the longer side is larger 12. Prove that in any triangle, the side opposite to the larger angle is longer 13. Prove that the sum of any two sides of a triangle is greater than the third side		cm, QR = 4 cm and <PQR = 45^0 We will observe the AC = PR and <A = <P and <C = <R. Activity (to assess learning) To show that in a triangle longer side has greater angle opposite to it.(by cutting and pasting method.)	parts of congruent triangles(CPCT). 8.Explain the non-criteria for the congruence of triangles 9.Prove that the angles opposite to the equal sides of an isosceles triangle are equal 10.Prove that the sides opposite to the equal angles of a triangle are equal 11. Prove that if two sides of a triangle are unequal, then the angle opposite to the longer side is larger 12. Prove that in any triangle, the side opposite to the larger angle is longer 13. Prove that the sum of any two sides of a triangle is greater than the third side 14.understand the concept of congruency which will help them to plot figures of same shape and size.	
OCTOBER –	Quadrilaterals	Students will be able to: 1. Describe the types of quadrilaterals and their properties. 2. Prove the angle sum property of	After getting the concept of quadrilateral, the student will analyze the application of their properties in	*Activity (to introduce the lesson) Students will be asked about the shape which has been formed by joining the three sides i.e.,	Students would be able to: 1. Describe the types of quadrilaterals and their properties. 2. Prove the angle sum property of quadrilaterals.	Assessment will be done on the basis of decided rubrics

		quadrilaterals. 3. Describe the types of parallelogram and their properties. 4. Prove that the diagonal of a parallelogram divides it into two congruent triangles. 5. Prove that if each pair of opposite sides of a quadrilateral is equal then it is a parallelogram. 6. Prove that if each pair of opposite angle of a quadrilateral is equal then it is a parallelogram. 7. Prove that if each pair of opposite sides of a quadrilateral is equal and parallel in a quadrilateral, then it is a parallelogram. 8. Prove that if diagonals of a Quadrilateral bisect each other, then it is a parallelogram. 9. Prove the midpoint theorem and its converse.	day to day life, for example- *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 easy to tessellate, or pattern with.	triangle. *Activity (to support learning) Now students will be asked about the shape formed by joining the four sides. i.e., quadrilateral. *Activity (to assess learning) Verification of midpoint theorem by paper folding and pasting method.	3. Describe the types of parallelogram and their properties. 4. Prove that the diagonal of a parallelogram divides it into two congruent triangles. 5. Prove that if each pair of opposite sides of a quadrilateral is equal then it is a parallelogram. 6. Prove that if each pair of opposite angle of a quadrilateral is equal then it is a parallelogram. 7. Prove that if each pair of opposite sides of a quadrilateral is equal and parallel in a quadrilateral, then it is a parallelogram. 8. Prove that if diagonals of a Quadrilateral bisect each other, then it is a parallelogram. 9. Prove the midpoint theorem and its converse. 10. Analyze the application of the properties of quadrilaterals in day to day life, for example- • 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 easy to tessellate, or pattern with. • Shapes like trapeziums: with a wide base and a narrower top, are used for construction of buildings.	
NOVEMBER	Area of Parallelogram & Triangle	Students will be able to 1) Identify Figures on the same base and between the same parallels. 2) Understand and apply the concept that 'a diagonal of parallelogram divides it into two triangles of equal area' 3) Understand and apply the concept that 'Parallelograms on equal bases and between the same parallels are equal in area'. 4) Understand 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'. 5) Apply the formula for finding the area of a trapezium (Formula - Half the product of its height and the sum of the parallel sides)	They will be able to recognize equal areas of triangular and parallelogram shapes and compares the areas of triangles and parallelograms in certain conditions.	Activity (to introduce the lesson) prove that: 1. Area of parallelogram = base x height 2. Area of a parallelogram is the same as the area of the corresponding rectangle by paper cutting and pasting.	Students would be able to: 1) Identify Figures on the same base and between the same parallels. 2) Understand and apply the concept that 'a diagonal of parallelogram divides it into two triangles of equal area' 3) Understand and apply the concept that 'Parallelograms on equal bases and between the same parallels are equal in area'. 4) Understand 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'. 5) Apply the formula for finding the area of a trapezium (Formula - Half the product of its height and the sum of the parallel sides) 6) Develop the ability to	Assessment will be done on the basis of decided rubrics

					recognize equal areas of triangular and parallelogram shapes and compare the areas of triangles and parallelograms in certain conditions.	
DECEMBER	Circles	Students will be able to: 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.	By solving variety of problems, students will attain following behavioral objectives 1. They will be able to understand and apply the properties of circles and circular regions. 2. They can apply the knowledge of circles in making drawings, model making, projects etc	Activity(to assess learning) 1.To verify that – *"The angle subtended by an arc at the centre is double the angle subtended by it at point on the remaining part of the circle"* 2. To verify that – *"Opposite angles of a cyclic quadrilateral are supplementary .*	Students would be able to: 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. 6) apply the knowledge of circles in making drawings, model making, projects etc	Assessment will be done on the basis of decided rubrics
DECEMBER	Constructions	Students will be able to construct: 1) The bisector of a line segment 2) The bisector of a given angle	By solving variety of problems, students will attain following behavioral objectives	Activity (to introduce the lesson) Construct all angles which are multiple of 15^0 on the same ray (like 30^0, 45^0 etc)	Students would be able to construct: 1) The bisector of a line segment	Assessment will be done on the basis of decided rubrics

		3) The angles which are multiples of 15^0 4) A triangle with given conditions and their justification	1. They will be able to understand and apply the properties of constructions wherever required 2. They can apply the knowledge of constructions in making drawings, model making, projects etc	Activities (to assess learning) 1. Construct a perpendicular bisector of a line with measurement 10.5 cm. 2. Draw an angle bisector of angle of 45^0. 3. Construct a triangle whose perimeter is 10.4 cm and its two angles are 45° and 120^0.	2) The bisector of a given angle 3) The angles which are multiples of 15^0 4) A triangle with given conditions and their justification *Students will be able to understand and apply the properties of constructions wherever required * They can apply the knowledge of constructions in making drawings, model making, projects etc	

JANUARY –	Herons formula	Students will be able to
		• Recall the term triangles and area of triangles.
		• Understand and apply the concept of Heron's formula
		• Calculate the area of a triangle using Heron's formula.
		• Calculate the area of a quadrilateral using Heron's formula.
			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:-
			• 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
				• Activity (to introduce the lesson)
				Students will be asked to derive the formula for the area of an equilateral triangle whose side is "a"
				
				• Activity (to support learning)
				Then students will be asked a question.
				There is a slide in a park. One of its side walls has been painted in some color with a message "KEEP THE PARK GREEN AND CLEAN". If the sides of wall are 15m, 11m and 6m, Find the area painted in color.
					Students would be able to:
					• Recall the term triangles and area of triangles.
					• Understand and apply the concept of Heron's formula
					• Calculate the area of a triangle using Heron's formula.
					• Calculate the area of a quadrilateral using Heron's formula.
					• Use Heron's formula in our daily life in the following ways:-
					  • To find the area of triangular park
					  • To find area of scalene
						Assessment will be done on the basis of decided rubrics

			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 impossible in this world.		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 impossible in this world.	
JANUARY	Surface Area and Volume	Students will be able to: 1. Understand the concept of surface area and volume 2. Apply the concept of surface areas and volumes of a cuboids. 3. Apply the concept of surface areas and volumes of a cube 4. Apply the concept of surface areas and volumes of a right circular cylinders 5. Apply the concept of surface areas and volumes of a cone.	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.	Activity (to introduce the lesson) To generate formula of LSA and TSA of cylinder.	Students would be able to: 1.Understand the concept of surface area and volume 2. Apply the concept of surface areas and volumes of Cuboids. 3.Apply the concept of surface areas and volumes of a cube 4.Apply the concept of surface areas and volumes of a right circular cylinders 5. Apply the concept of surface areas and volumes of a cone. 6. Apply the concept of surface areas and volumes of a spheres and hemispheres. 7. Calculate and compare the surface areas and volumes of	Assessment will be done on the basis of decided rubrics

		6. Apply the concept of surface areas and volumes of a spheres and hemispheres.			solid shapes like cuboids, cubes, right circular cylinders, right circular cones, spheres and hemispheres.	
FEBRUARY	Statistics	Students will be able to: 1. Define different types of data with example 2. Create a frequency distribution table with suitable class interval . 3. Define and differentiate between terms like range, class interval, class size, class width, class mark and so on 3. Draw a bar graph to represent the given data 4. Interpret data from the given bar graph 5. Draw a histogram to represent the given data 6. Interpret the data represented in a histogram. 7. Differentiate between bar graph, double bar graph and histogram 8. Draw a frequency polygon with the help of a histogram 9. Calculate the mean, median	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.Students become more arranged and systematic	Activity (to support learning) Teacher will give some example from day to day life and ask the Students will compare that which representation (bar graph/double bar graph/histogram/frequency polygon) will be better for given data like 1. To compare the performance of two students in each subject. 2. Average run rate of two teams 3. Height of 35 students of a class 4. Production of automobiles in last 10 years by a particular company.	Students would be able to: 1. Define different types of data with example 2. Create a frequency distribution table with suitable class interval . 3. Define and differentiate between terms like range, class interval, class size, class width, class mark and so on 3. Draw a bar graph to represent the given data 4. Interpret data from the given bar graph 5. Draw a histogram to represent the given data 6. Interpret the data represented in a histogram. 7. Differentiate between bar graph, double bar graph and histogram 8. Draw a frequency polygon with the help of a histogram	Assessment will be done on the basis of decided rubrics

		and mode of the given (group/ungroup) data 10. Interpret the importance of the measure of central tendency for the given data.			9. Calculate the mean, median and mode of the given (group/ungroup) data 10. Interpret the importance of the measure of central tendency for the given data. 11. Find average of anything from real life situation like his/her Result, average of monthly household expenses, run rate of any cricket match 12. Become more arranged and systematic	
FEBRUARY	Probability	Students will be able to: 1. Define probability. 2. Differentiate between theoretical and experimental probability. 3. List the practical applications of probability. 4. Define possible and impossible event. 5. List the examples of possible and impossible event. 6. Conduct experiments to measure probability 7. Define the terms 'experiment', 'trial', 'event' and 'outcome' 8. Calculate probability of an outcome in a given event	1. Student learn idea of fair selection 2. When they repeat a particular activity in real life, *n* number of times they get more precise and accurate results	Activity (to support learning) To understand the probability by the deck of playing cards and throwing the dice.	Students would be able to: 1. Define probability. 2. Differentiate between theoretical and experimental probability. 3. List the practical applications of probability. 4. Define possible and impossible event. 5. List the examples of possible and impossible event. 6. Conduct experiments to measure probability 7. Define the terms 'experiment', 'trial', 'event' and 'outcome' 8. Calculate probability of an outcome in a given event 9. Learn idea of fair selection 10. Get more precise and accurate results, when they repeat a particular activity in real life, *n* number of times	Assessment will be done on the basis of decided rubrics
February - March	REVISION for Final Assessment Test (FAT)					