MATHEMATICS LESSON PLAN



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Unit: 01 Methodology: Demonstration cum lecture

method Unit name: Number systems

Date: From to

- 1. Finding many rational numbers between two given rational numbers
- 2. Locate irrational numbers on number line
- 3. Decimal expansion of real numbers
- 4. Operations on real numbers
- 5. To rationalizing the denominator
- 6. Laws of exponents for real number

Steps Activities To Favourable For Learning			Τ	I n	_	
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' ¹				Activity		
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	Elaborat	they also able to solve the problems on			students	
e laws of exponents. textbook	e	laws of exponents.	textbook			
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e problems based on our daily life all	e	problems based on our daily life			all	
situations and help the students in problems		situations and help the students in			problems	

the implementation of the above		in	
formulas in this problems.		textbook.	

Head master or mistress/Principal

Unit: 02 Methodology: Demonstration cum lecture

method Unit name: Polynomials.

Date: From to

Objectives:

1. To understand the degree of the polynomials

- 2. To check the zeros of the polynomials
- 3. Factorizing the polynomials
- 4. Remainder theorem
- 5. Algebraic identities

			Evaluation	Teachers	TIM
<u>Steps</u>	Activities To Favourable For	TLM	Tools &	Introspecti	E
	Learning		Technique	on	
			S		
	Start the session by checking the	Chart of	Discussion	Will try to	
Engage	previous knowledge, asking	algebraic	& group	answers	
	questions monomials, binomials	terms,	discussion.		
	and trinomials, etc.	board.			
	Addition, subtraction, multiplication	Chart	Questionnai	Answering	
Explore	and division of algebraic terms,	Different	re	for	
	Evaluation of an algebraic expression	colors of		supplement	
	for the given values of variable. Now	chalks		ary	
	introduce the chapter polynomials.	projector		questions.	
	Introduction to Polynomials:	Chart	Discussion		
	Recognize variables and their degree in	Different	& group		
	a given algebraic expression in order to	colors of	activities		
	differentiate whether given expression	chalks			
	is a polynomial in one variable or not.	projector			
	Polynomials in one variable:				
_	Substitute the value of 'a' in a given				
Explain	expression p(x) in order to find the				
	value of polynomial at 'a' i.e. p(a).				
	Zeroes of a Polynomial: Use given				
	values for the variable 'x' in a				
	polynomial p(x) in order to identify if				
	the given value is a zero of the				
	polynomials.				
	Remainder Theorem: Using				
	Remainder Theorem, calculate				
	division of $p(x)$ by a linear polynomial				
	'x – a' in order to find that the				
	remainder is p(a) and verify using				
	long division method.				
	Algebraic Identities: Point out to an				
	algebraic identity that can be used in				
	order to factorize a				
	given expression.				

	Identifies/Classifies polynomials among algebraic expressions in order to apply	Exercise problem	Activity	Discussion with	
Elaborat	appropriate algebraic identities to	s In		students	
e	factorize them.	textbook			
Evaluat	Now the teacher will discuss the	Textbook	Evaluation	Try to do	
e	above concepts by taking varied			all	
	examples. Solve the problems given in			problems	
	textbook.			in	
				l texthook - L	

Unit: 09 Methodology: synthetic and analytic

method Unit name: Coordinate geometry.

Date: From to

Objectives:

1. Cartesian plane axis & quadrants.

2. Coordinates of a point, name and terms associated with the coordinate plane.

3. Plotting points in the plane.

<u>Steps</u>	Activities To Favourable For	TLM	Evaluation Tools &	Teachers Introspecti	TIM
<u>эсерь</u>	Learning	1 21.1	Technique	on	Е
			S		
	Start the session by checking the	Chart,	Discussion	Will try to	
Engage	previous knowledge, by asking the	Projector	& group	answers	
	questions algebraic and geometric terms ect.	chalks.	discussion.		
	Teacher ask the class about the	Chart	Questionnai	Answering	
Explore	meaning of word "geometry". After	project	re	for	
	getting the different answers from the	or ppt		supplement	
	class, introduce the chapter.			ary	
				questions.	
	Introduction: to locate the point in the	Graph	Discussion		
	plane we use a system of two lines	Smart	& group		
	which are perpendicular to each other.	board	activities		
	This system was first developed by	Projector			
	French mathematician Rene Descartes.	Geometry			
	Cartesian coordinate system:	kit			
Explain	y, asia	Ect.			
	Horizontal line 4 3 2 1 1 2 3 4 2 x axis				
	-1 -2 -3				
	Deep explanation about Cartesian				
	system. Representation of coordinates				
	in Cartesian plane:				
	,B • • • • • • • • • • • • • • • • • • •				
	74 E				
	-4 -3 -2 -1 0 1 3 3 -4 1 3 -4 1 5 3 -4 1 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5				
	, C 3				

	Make a student group and give them to	Exercise	Activity	Discussion	
	locate the points on Cartesian plane. By	problem		with	
Elaborat	using different examples they make	s In		students	
e	perfect.	textbook			
Evaluat	Teacher will assign some problems to	Textbook	Evaluation	Try to do all	
e	do work. For practice students should			problems in	
	do problems in			textbook.	
	textbook.				

Head master or mistress/Principal

Unit: 04 Methodology: Demonstration & project

method Unit name: linear equations in two variables.

Date: From to

Objectives:

1. To know about equations, linear equations in two variables

- 2. To understand a linear equations in two variables has many solutions.
- 3. To understand the graph of every linear equation in two variables is a straight line
- 4. To find the many solutions in linear equations in two variables
- 5. To know about a linear equations is parallel to x axis and y axis

<u>Steps</u>	Activities To Favourable For Learning	TLM	Evaluation Tools & Technique s	Teachers Introspecti on	TIM E
Engage	Start the session by checking the previous knowledge, by asking the questions related to linear equations in one variable, Cartesian coordinate system and representing points ect.	Chart, Projector chalks.	Discussion & group discussion.	Will try to answers	
Explore	Teacher will ask the class about linear equations in one variable. After getting the different answers from the class, introduce the chapter.	Chart project or ppt	Questionnai re	Answering for supplement ary questions.	

	Linear equations in one variable:	Markers	Discussion		
	ax+b=0, $3x+4=0$ & $-3y+5=0$	Smart	& group		
	Linear equations in two variable:	board	activities		
	3x+2y=4 & 4z-3y+5=0	Projector			
	Solutions of linear pair of linear	Graph			
	equations:	Geometry			
	Let us take an example	kit			
Explain	3x+4y=12, If y=0, then x=4	Ect.			
	If y=3, then				
	x=8 If y=-3,				
	then x=0 If				
	y=-6, then				
	x=-4				
	Make a student group and give them to	Exercise	Activity	Discussion	
	solve the problems by taking different	problem		with	
Elaborat	examples of linear equations. help them	s In		students	
e	to plot the graph.	textbook			
Evaluat	Teacher will assign some problems to do	Textbook	Evaluation	Try to do all	
e	work.			problems in	
	For practice students should do			textbook.	
	problems in textbook.				

Head master or mistress/Principal

Unit: 05 Methodology: inductive and deductive Unit name: Introduction to Euclid's

Geometry.

Date: From to

- 1. To know about undefined terms.
- 2. To know about Euclid's postulates and axioms
- 3. Understand the axioms and postulates
- 4. Know about two equivalent versions of Euclid's fifth postulate.

				Evaluation	Teachers	TIM
	<u>Steps</u>	Activities To Favourable For	TLM	Tools &	Introspecti	E
		Learning		Technique	on	
L				S		
Γ		Basic knowledge of terminology used in	Chart of	Discussion	Will try to	
	Engage	geometry such as circle, point, lines,	numbers,	& group	answers	
L		regions etc	board.	discussion.		

Explore	Teacher will start the class by defining a rectangle. So, to define one thing, you need to define many other things, and you may get a long chain of definitions without an end, for example, you might get the term 'point' in one of the definitions which is very difficult to simplify/define further.	Chart Calendar projector	Questionna ire	Answering for supplement ary questions.	
	Introduction: Give examples of theorems, postulates and axioms in order to differentiate between them with examples	Board Smart board ppt	Discussion & group activities		
Explain	Euclid's Definitions, Axioms and Postulates: Reproduce Euclid's axioms in your own words in order to give examples for each List Euclid's 5 postulates in order to visualize and illustrate them through a diagram Analyze given statements/postulates in order to determine if they are extensions of Euclid's postulates Apply Euclid's postulates in order to prove basic geometrical concepts about lines, points, planes, shapes, etc				
	Applies axiomatic approach and derives proofs of mathematical statements	Exercise problem	Activity	Discussion with	
Elaborat	particularly geometric shapes in order	s In		students	
e	to solve the problems on them.	textbook			
Evaluat	Now the teacher will discuss the above	Textbook	Evaluation	Try to do	
e	axioms by taking varied examples and			all	
	introducing Postulates in the same way. Solve the problems given in			problems	
	, ,			in textbook	
	textbook.			textbook.	

Unit: 06 Methodology: Demonstration cum lecture

method Unit name: Lines and angles.

Date: From to

Objectives:

1. To know about linear pair axiom.

- 2. To know about how vertically opposite angles are equal.
- 3. To understand what happened if two transversal lines parallel

<u>Steps</u>	Activities To Favourable For Learning	TLM	Evaluati on Tools & Techniq	Teachers Introspection	T I M E
			ues		

Engage	Start the session by checking the previous knowledge, asking questions related to Parallel lines, intersecting	Chart of numbers, board.	Discussio n & group discussio	Will try to answers	
	lines,transversal, corresponding angles, alternate interior angles, etc.		n.		
Explore	The teacher will ask the following questions: What is a transversal? What are exterior angles? What are interior angles? By getting answers, introduce the	Chart Calendar projector	Question naire	Answering for supplementary questions.	
	chapter.				
Explain	Basic Terms and Definitions: Define segment, ray, collinear points, non-collinear points, acute angle, right angle, obtuse angle, straight angle, reflex angle, complementary angles. Pairs of Angles: Label angles created by 2 intersecting lines in order to identify vertically opposite pairs, adjacent angles, linear pairs, complementary/supplementary pairs of angles. Parallel Lines and a Transversal: Label angles created by a transversal intersecting two parallel lines in order to identify corresponding angles, alternate angles, interior angles and define relationship between these angles. Angle Sum Property of a Triangle: Define relationship between angles formed when a triangle is placed between two parallel lines in order to prove that exterior angle of a triangle is the sum of the two opposite interior angles.	Board Smart board Ppt Geometry kit	Discussio n & group activities		
Elaborat		Exercise problems In	Activity	Discussion with students	
e Evaluat e	solve the problems on them. Now the teacher will discuss the above concepts by taking varied examples. Solve the problems given in textbook.	textbook Textbook	Evaluation	Try to do all problems in textbook.	

Unit: 07 Methodology: Demonstration & lecture

method Unit name: Triangles.

Date: From to

- 1. To understand the congruent figures.
- 2. To know about congruent triangles.
- 3. To understand the rule of the congruent.
- 4. To know about sides related to the triangles.

5. Understand the sum of any two sides of a triangle is greater than the third side.

<u>Steps</u>	Activities To Favourable For Learning	TLM	Evaluation Tools & Technique	Teachers Introspecti on	TIM E
Engage	Students know that Construction of triangles, ASA, SSS, SAS, RHS Congruence. On the basis of this knowledge teacher will ask some questions.	Chart, board.	Discussion & group discussion.	Will try to answers	
Explore	Teacher will ask the class about different types of triangles and about simple properties. After getting different answers from the class now teacher introduce the chapter.	Char t Pap er ppt	Questionnai re	Answering for supplement ary questions.	
Explain	Congruence: Now teacher will explain the congruence of things, figures & finally triangles. SSA SSA SSA SAS, RHS theorems.	Geometr y kit Chart paper Markers Smart board projector Ect.	Discussion & group activities		
Elaborat e Evaluat e	Students will understand the different types of triangles, congruence conditions, triangular in equalities and theorems. Now the teacher will discuss the above concepts by taking varied examples. Solve the problems given in textbook.	Exercise problem s In textbook Textbook	Activity Evaluation	Discussion with students Try to do all problems in textbook.	

Subject teacher

Head master or mistress/Principal

Unit: 08 Methodology: Demonstration & lecture

 $method\ Unit\ name:\ Quadrilaterals.$

Date: From to

 $^{^{1\!.}}$ To understand the sum of the angles of the quadrilateral is $360^{0\!.}$

- 2. To know about a diagonal of a parallelogram divides it in to two congruent triangles
- 3. To know about how quadrilaterals is a parallelogram
- 4. To understand diagonals of a rectangle bisect each other and are equal.
- 5. To understand a line through the mid-point of a side of a triangles parallel to another side bisects the third side.
- 6. To know about how the quadrilateral formed by joining the mid-points of the sides of a quadrilateral, in order, is a parallelogram.

<u>Steps</u>	Activities To Favourable For Learning	TLM	Evaluation Tools & Technique s	Teachers Introspecti on	TIM E
Engage	Start the session by checking the previous knowledge, by asking the questions related to properties of triangles, quadrilaterals and types of quadrilaterals, ect.	Chart, Different colors of chalks.	Discussion & group discussion.	Will try to answers	
Explore	Teacher will ask the class about different types of polygons and then different types of quadrilaterals. After getting different answers from the class, introduce the chapter.	Char t Pap er ppt	Questionnai re	Answering for supplement ary questions.	
Explain	Quadrilaterals: explain about quadrilaterals and its properties. Also explain types of quadrilaterals. Teacher should explain all the theorems mentioned in the objective and guide the students to prepare only those theorems for examination. In order to increase the concept of clarity in the minds of the student teacher should divide the content in parts and prepare worksheet for all types of students.	Geometr y kit Chart paper Markers Smart board projector Ect.	Discussion & group activities		
Elaborat e	Students will be able to understand the concept of quadrilaterals, types and properties.	Exercise problem s In textbook	Activity	Discussion with students	
Evaluat e	Teacher will assign some problems to do work. For practice students should do problems in textbook.	Textbook	Evaluation	Try to do all problems in textbook.	

Head master or mistress/Principal

Unit: 09 Methodology: Demonstration & lecture

method Unit name: Circles.

Date: From to

Objectives:

- 1. To understand the definition of circles, related to terms of circles.
- 2. To know about equal chords of the circle subtend equal angles at the centre
- ${\bf 3.}\ To\ understand\ perpendicular\ from\ the\ centre\ of\ a\ circle\ to\ a\ chord\ bisects\ the\ chord.$
- 4. To know there is one and only one circle passing through three non-collinear points.

5. To understand the angles in the same segment of a circle are equal.

5	To understand the angles in the same segment of a	circle are	equal.		
<u>Steps</u>	Activities To Favourable For Learning	TLM	Evalu ation Too ls & Tech	Teachers Introspectio n	T I M E
			niqu es		
Engage	Start the session by checking the previous knowledge, by asking the questions related to parts of circles ect.	Cha rt, ppt color chalks.	Discuss ion & group discuss ion.	Will try to answers	
Explore	Teacher will ask the class about parts of circles. After getting the different answers from the class, introduce the chapter.	Chart proje ctor ppt	Questi onnair e	Answering for supplementa ry questions.	
Explain	Circles and its Related Terms: A Review Define radius, chord, diameter, segment (major and minor), arc (major and minor), interior or exterior of a circle in order to illustrate and label them on a given circle. Angle Subtended by a Chord at a Point: Apply theorems regarding angle subtended by a chord in a circle in order to find the measure of an angle in the given figure. Circle through Three Points: Construct circle passing through 1, 2 & 3 non-collinear points in order to comment on how many circles can be constructed passing through them. Angle subtended by arc of the circle: Interpret and apply theorems on the angles subtended by arcs of a circle in order to solve for unknown values in given examples. Cyclic Quadrilaterals: Apply the relation between angles of a cyclic quadrilateral in order to solve for the value of a given angle.	Marker s Smart board Project or Geomet ry kit Paper cut out of circles Ect.	Discuss ion & group activiti es		
Elaborat e	Make a student group and give them to solve the problems by taking different examples circles, help them to prove themselves.	Exerci se proble ms In textbo ok	Activity	Discussion with students	
Evaluat e	Teacher will assign some problems to do work. For practice students should do problems in textbook.	Textboo k	Evaluati on	Try to do all problems in textbook.	

Unit: 10 Methodology: Demonstration &

inductive Unit name: Heron's formula.

Date: From to

- 1. To understand the areas of different types of geometrical figures
- 2. To know about how to find the area of triangle
- 3. To understand the finding of area of triangle when 3 sides given.
- 4. To calculate the area of a quadrilateral whose sides and diagonal are given by using Heron's formula

<u>Steps</u>	Activities To Favourable For Learning	TLM	Evaluation Tools & Technique s	Teachers Introspecti on	TIM E
Engage	Start the session by checking the previous knowledge, by asking the questions related to different types of triangles, perimeter, & area ect.	Chart, Projector chalks.	Discussion & group discussion.	Will try to answers	
Explore	Teacher will ask the class about meaning of lines and angles, and different types of angles. After getting the different answers from the class, introduce the chapter.	Chart project or ppt	Questionnai re	Answering for supplement ary questions.	
Explain	Introduction: Calculate area of a given triangle to state the limitation of the Standard formula (Area of Triangle = $1/2 \times b \times h$). Area = $\frac{1}{2}absin(\alpha) = 24$ Area of a Triangle by Heron's formula: Apply Heron's formula in order to calculate the area of a Triangle. Application of Heron's Formula in finding Areas of Quadrilateral: Breakdown a given polygon into	Markers Smart board projector Ect.	Discussion & group activities		
	triangles in order to find the area of a given polygon as a sum of areas of those triangles. Students will be able to understand the	Exercise	Activity	Discussion	
Elaborat e	concept of Heron's formula, will do problems individually. Additional problems will solve with the help of teacher.	problem s In textbook		with students	

Evaluat	Teacher will assign some problems to	Textbook	Evaluation	Try to do	ĺ
e	do work. For practice students should			all	
	do problems in textbook.			problems	
				in	
				textbook.	

Head master or mistress/Principal

Unit: 11 Methodology: Demonstration, problem solving & lecture

method Unit name: Surface area and volumes.

Date: From to

Objectives:

1. To calculate surface area of a cuboid

- 2. To calculate the surface area of a cube
- 3. To calculate the surface area of a cylinder
- 4. To calculate the total surface area of cylinder
- 5. To calculate the curved surface area of cone
- 6. To calculate the total surface area of a right circular cone
- 7. To calculate the surface area of sphere
- 8. To calculate the volume of cube
- 9. To calculate the volume of cylinder
- 10.To calculate the volume of cone

<u>Steps</u>	Activities To Favourable For Learning	TLM	Evaluation Tools & Technique s	Teachers Introspecti on	111
Engage	Start the session by checking the previous knowledge, by asking the questions related constructions of cubes ect.	Chart, ppt color chalks.	Discussion & group discussion.	Will try to answers	
Explore	Teacher will ask the class about solid shaped regarding to the geometry. After getting the different answers from the class, introduce the chapter.	Chart projecto r scissor, paper cut ppt	Questionnaire	Answering for supplemen tary questions.	

	Surface Area of a Cuboid and a Cube:	Chart	Discussion &		Ī
	Calculate the surface area (lateral and	projecto	group		
	total) of the cube or cuboid in order to	r	activities		
	determine the cost of painting/covering	scissor,			
	the given surface.	paper			
	Surface Area of a Right Circular	cut ppt			
	Cylinder: Calculate the surface area	modals			
Explain	(curved and total) of a cylinder to				
	determine the cost of painting/covering				
	the given surface.				l
	Surface Area of a Right Circular Cone:				l
	Calculate the surface area (curved and				l
	total) of a cone to determine the cost of				l
	painting/covering the given surface.				l
	Surface Area of a Sphere: Calculate the				l
	surface area of a sphere/hemisphere to				
	determine the cost of painting/covering				
	the given surface of a				
	sphere/hemisphere.				
	Volume of a Cube: Calculate the volume				
	of a given cube in order to infer the				
	quantity of any substance it can hold.				
	Volume of a Cuboid: Calculate the volume				
	of a				
	given cuboid in order to infer the quantity				
	of any substance it can hold.]
	Volume of a Cylinder: Calculate the		<u> </u>		1
	volume of a given cylinder in order to				ĺ

	volume of a given cone in order to infer the quantity of any substance it can hold Volume of a sphere: Calculate the volume of a given sphere in order to infer the quantity of any substance it can hold. Volume of a hemisphere: Calculate the volume of a given hemisphere in order to infer the quantity of any substance it can hold. Volume of a hemisphere: Calculate the volume of a given hemisphere in order to infer the quantity of any substance it can hold.				
	Make a student group and give them to	Exercise	Activity	Discussion	
Elaborat e	solve the problems by taking different examples in surface area and volumes, help them to prove themselves.	problem s In textbook		with students	

Evaluat	Teacher will assign some problems to	Textbook	Evaluation	Try to do		ĺ
e	do work. For practice students should			all	ı	l
	do problems in textbook.			problems	ı	ĺ
				in	ı	l
				textbook.	ı	ĺ

Head master or mistress/Principal

Unit: 12 Methodology: Demonstration & lecture

method Unit name: Statistics.

Date: From to

- 1. To understand facts or figures, collected with a definite purpose, are called data.
- 2. To understand bar graph, pie chart.
- 3. Statistics is the area of study dealing with the presentation, analysis and interpretation of data.
- 4. How data can be presented graphically in the form of bar graphs, histograms and frequency polygons.
- 5. The three measures of central tendency for ungrouped data.

			Evaluation	Teachers	TIM
<u>Steps</u>	Activities To Favourable For	TLM	Tools &	Introspecti	TIM E
34455	Learning	1 2 1	Technique	on	E
	3		S		
	Start the session by checking the	Chart	Discussion	Will try to	
Engage	previous knowledge, by asking the	, ppt	& group	answers	
	questions related to tally marks,	color	discussion.		
	frequency ect.	chalks.			
	Teacher will ask the class about	Chart	Questionnai	Answering	
Explore		project	re	for	
	interval ect. After getting the different	or		supplement	
	answers from the class, introduce the	paper		ary	
	chapter.	cut ppt		questions.	
	Frequency Table: Record and label a	Pen	Discussion		
	given data set in order to create a	Paper	& group		
	frequency table.	Penci	activities		
	Bar Graph: Identify an appropriate	ls			
	scale and labels in order to represent	Scale			
	given data through a bar graph.	ect			
_ , ,	Histogram: Read the given data in				
Explain	order to create a histogram for				
	continuous and discontinuous data				
	sets.				
	Frequency Polygon: Read the given				
	data in order to create a frequency				
	polygon for given data sets.	г .	A atiit	D: :	
	Represents given data in different forms	Exercise	Activity	Discussion	
F1 1	like, tabular form (grouped or	problem		with	
	ungrouped), bar graph, histogram (with	s In		students	
e	equal and varying width and length),	textbook			
	and frequency polygon in order to				
	analyze				

	given data.				
Evaluat	Teacher will assign some problems to	Textbook	Evaluation	Try to do all	
e	do work. For practice students should			problems in	
	do problems in			textbook.	
	textbook.				

Head master or mistress/Principal