Metric 2.4.12- Performance of students during internship is assessed by the institution in terms of observations of different persons such as

1. Self
2. Peers (fellow interns)
3. Teachers / School* Teachers
4. Principal / School* Principal
5. B.Ed. Students / School* Students

Clarification Asked-

HEI has not provided any supporting documents as per SOP. HEI needs to provide the assessment criteria adopted by each of the selected persons (For Bachelor and PG Programmes as applicable) Two filled in sample observation formats for each of the claimed assessors

Response-

1. Two filled in sample observation formats for each of the claimed assessors are attached. (Appendix-I)

2023-2024

APPENDIX

I

SHEELA MULTIPURPOSE SOCIETY

SHEELADEVI COLLEGE OF EDUCATION

WADI, NAGPUR

2023 - 2024

MICRO - TEACHING
LESSON PLANNING BOOK
सूक्ष्म अध्यापन
पाठ नियोजन पुस्तिका

Name Ms. Suman Ketan Sukhdeve
नांव

Number _____
क्रमांक

Subject
विषय

1) Physics

2) Mathematics

अनुक्रमणिका
INDEX

पाठांक S.No.	दिनांक Date	कौशल्य क्रमांक Skill No.	हस्ताक्षर Signature
1.		INTRODUCTION SKILL	Skelbande
	23.11.23	a) Physics	
	25.11.23	b) Mathematics	
2.		QUESTIONING SKILL	Skelbande
	30.11.23	a) Physics	
	02.12.23	b) Mathematics	
3.		EXPLANATION SKILL	skelbande
	05.12.23	a) Physics	
	07.12.23	b) Mathematics	
4.		STIMULUS VARIATION SKILL	Skelbande
	11.12.23	a) Physics	
	13.12.23	b) Mathematics	
5.		BLACKBOARD WRITING SKILL	Skelbande
	16.12.23	a) Physics	
	19.12.23	b) Mathematics	
6.		INSPECTION	Skelbande
	22.12.23	a) Physics	
	26.12.23	b) Mathematics	
7.		REINFORCEMENT SKILL	Skelbande
	22.12.23	a) Physics	
	26.12.23	b) Mathematics	
8.		ILLUSTRATING WITH EXAMPLES	Skelbande
	29.12.23	a) Physics	
	01.01.24	b) Mathematics	
9.		CLOSURE SKILL	Skelbande
	04.01.24	a) Physics	

INTRODUCTION SKILL

प्रस्तावना कौशल्य

SUBJECT - PHYSICS

TOPIC - MOTION

वेळ – ५ मिनिट

Time Duration : 5 Minutes

Teacher Activity (शिक्षक कृती)	Student Activity (विद्यार्थी कृती)	Sub-Skills (उपकौशल्य)
NOTE: Teaches asked.	NOTE: Student answered properly.	
[T] Q. What is movement?	[S] Students answered that going here and there.	To develop the curosity about the topic.
[T] Q. How you will go home?	[S] Student answered that by bicycle, auto, van, etc.	To establish the link between studen
[T] Q. Is movement and exercise are related to each other?	[S] Student answered may be by walk it is exercise.	To know more about their daily routine.

INTRODUCTION SKILL
प्रस्तावना कौशल्य

वेळ – ५ मिनिट
Time Duration : 5 Minutes

Teacher Activity (शिक्षक कृती)	Student Activity (विद्यार्थी कृती)	Sub-Skills (उपकौशल्य)
T Q. How many of know about the direction?	S Student answered that direction is a particular way.	To check the basic knowledge.
T Q. The movement in a particular exercise is done by you or not?	S The excercise of the movement of the body gives a particular direction.	To check their presence of mind.
T Q. Students, can you tell me the what is the phenomenon?	S Student asked exercisal movement.	To develop the curiosity.

ANNOUNCEMENT OF TOPIC :

Found that students are so sharp and answered well about the topics.

Today, we will study about the topic 'MOTION'.

INTRODUCTION SKILL

प्रस्तावना कौशल्य

SUBJECT - MATHEMATICS

TOPIC - QUADRATIC EQUATION

वेळ – ५ मिनिट

Time Duration : 5 Minutes

Teacher Activity (शिक्षक कृती)	Student Activity (विद्यार्थी कृती)	Sub-Skills (उपकौशल्य)
NOTE: Teacher asked.	NOTE: Students answered properly.	
T Q. What is equation polynomials?	S It is the combination of variable and numbers.	To check the basic knowledge.
T Q. What is polynomial?	S It is the equation wherein the operations are used.	To know that what they know about it.
T Q. How many types of polynomials?	S There are three types of polynomials. a) Linear b) Quadratic c) Cubic	To know the previous class knowledge.

INTRODUCTION SKILL
प्रस्तावना कौशल्य

वेळ – ५ मिनिट
Time Duration : 5 Minutes

Teacher Activity (शिक्षक कृती)	Student Activity (विद्यार्थी कृती)	Sub-Skills (उपकौशल्य)
T Q. What is linear equation?	S The polynomial with highest power 1.	Link to previous knowledge
T Q. What is Quadratic equation?	S The polynomial with highest power 2.	
T Q. What is cubic equation?	S The polynomial with highest power 3.	

ANNOUNCEMENT OF TOPIC :

From the topic polynomial, we will learnt about the 'QUADRATIC EQUATION'.

INTRODUCTION SKILL

प्रस्तावना कौशल्य

OBSERVATION CHART
निरीक्षण तक्ता

Time Duration : 5 Minutes

वेळ – ५ मिनिट

उपघटक	पदनिश्चयन श्रेणी (चढत्या क्रमांक)				
	1	2	3	4	5
1) लक्षवेधक प्रेरण मिळाले काय ? अभिप्रेरणा प्राप्त हुई क्या ? Motivated or not				✓	
2) शेवट पर्यंत लक्ष खिळवून ठेवण्यात यश मिळाले काय ? शुरू से अंत तक ध्यान स्थिर रहा की नही ? Attention of the students was from the start till end or not.				✓	
3) अपेक्षित पुर्वज्ञान जागृती केली काय ? अपेक्षित पुर्वज्ञान जागृत हुवा की नही ? Previous knowledge was araised or not.				✓	
4) पाठ्यघटकाची सांगड पुर्वानुभवाशी घातली गेली काय ? पाठ्यांश पुर्वानुभव के साथ जोडा गया की नही ? Whether the topic was related to previous knowledge or not.				✓	

FEEDBACK प्रत्याभरण

Students have previous knowledge.
Topic related to previous knowledge.
Students listen carefully and try to give answers.

INTRODUCTION SKILL

प्रस्तावना कौशल्य

OBSERVATION CHART

निरीक्षण तक्ता

Time Duration : 5 Minutes

वेळ – ५ मिनिट

उपघटक	पदनिश्चयन श्रेणी (चढत्या क्रमांक)				
	1	2	3	4	5
1) लक्षवेधक प्रेरण मिळाले काय ? अभिप्रेरणा प्राप्त हुई क्या ? Motivated or not				✓	
2) शेवट पर्यंत लक्ष खिळवून ठेवण्यात यश मिळाले काय ? शुरू से अंत तक ध्यान स्थिर रहा की नही ? Attention of the students was from the start till end or not.				✓	
3) अपेक्षित पुर्वज्ञान जागृती केली काय ? अपेक्षित पुर्वज्ञान जागृत हुवा की नही ? Previous knowledge was araised or not.				✓	
4) पाठ्यघटकाची सांगड पुर्वानुभवाशी घातली गेली काय ? पाठ्यांश पुर्वानुभव के साथ जोडा गया की नही ? Whether the topic was related to previous knowledge or not.				✓	

FEEDBACK प्रत्याभरण

Topic was related to the previous knowledge. Students were actively answered.

Kulbarde
3/02/2024

QUESTIONING SKILL

प्रश्न कौशल्य

Sr. No. क्रमांक: 2
Subject विषय: Physics
Teaching अध्यापन: Questioning Skills
Sub – Unit विषयांश: Motion
Re-Teaching पुनर्ध्यापन:
Previous Knowledge पूर्वज्ञान: Distance, Speed
Class वर्ग: IX

Questioning Skill प्रश्न कौशल्य	Sub Skill उपकौशल्य	
TEACHER ACTIVITY	STUDENTS ACTIVITY	SUB-S
NOTE: Teacher asked questions.	NOTE: Students answered properly.	
[T] Q. What is motion?	[S] Students write the definition from the blackboard.	Low-level questi
[T] Q. Give some examples of motion.	[S] Students think and tell, movement of bicycle, movement of tyre of vehicle, etc.	Mid-level questio
[T] Q. If we drop an object on the surface of earth from certain height is that a motion?	[S] Movement of any object fall on the surface of earth i.e. there is motion.	High-level quest

QUESTIONING SKILL

प्रश्न कौशल्य

Sr. No. क्रमांक: 2
Subject विषय: Physics
Teaching अध्यापन: Questioning Skill
Sub – Unit विषयांश: Motion
Re-Teaching पुनर्ध्यापन:
Previous Knowledge पूर्वज्ञान: Distance, Speed
Class वर्ग: IX

Questioning Skill प्रश्न कौशल्य	Sub Skill उपकौशल्य	
T Q. What is vertical motion?	S The motion along the Y-axis.	High-level question
T Q. What is horizontal motion?	S The motion along the X-axis.	High-level question
T Q. Give the example of vertical and horizontal motion?	S The sewing machine.	Mid-level question
T Q. What is uniform motion?	S The rate of change of constant velocity with respect to constant time is called uniform motion.	Mid-level question

QUESTIONING SKILL

प्रश्न कौशल्य

Sr. No. क्रमांक: 3
Subject विषय: Mathematics
Teaching अध्यापन: Questioning skill
Sub – Unit विषयांश: Quadratic Equation
Re-Teaching पुनर्ध्यापन:
Previous Knowledge पूर्वज्ञान: About polynomial
Class वर्ग: X

Questioning Skill प्रश्न कौशल्य	Sub Skill उपकौशल्य	
TEACHER ACTIVITY	STUDENTS ACTIVITY	SUB-SK
NOTE: Teacher asked questions. [T] Q. What is algebraic expression?	NOTE: Students answered properly. [S] It is one type of equation in which variables and constants are used.	Low le question
[T] Q. What are the types of polynomials?	[S] Three types of polynomial a) Linear b) Quadratic c) Cubic	Mid-le question
[T] Q. What is linear equation?	[S] The equation in which the degree of the polynomial is 1.	Low-le question

QUESTIONING SKILL

प्रश्न कौशल्य

Sr. No. क्रमांक: 2

Subject विषय: Mathematics

Teaching अध्यापन: Questioning Skill

Sub – Unit विषयांश: Quadratic Equation

Re-Teaching पुनर्ध्यापन:

Previous Knowledge पूर्वज्ञान: About polynomial

Class वर्ग: X

Questioning Skill प्रश्न कौशल्य	Sub Skill उपकौशल्य	
[T] Q. What is quadratic equation?	[S] The equation in which the degree of the polynomial is 2.	Mid-level-question
[T] Q. What is cubic equation?	[S] The equation in which the degree of the polynomial is 3.	Mid-level question
[T] Q. Give the examples of quadratic equation.	[S] Students writing in their notebooks $x^2+2x+2=0$, etc.	High-level-question

QUESTIONING SKILL

प्रश्न कौशल्य

OBSERVATION CHART निरीक्षण तक्ता

Time Duration : 5 Minutes

वेळ – ५ मिनिट

Sub Skills उपकौशल्य	1	2	3	4	5	6	7	8	9	10
1) Type of Question प्रश्नाचे प्रकार/प्रश्न के प्रकार								✓		
2) Level of Question प्रश्नाचे स्तर/प्रश्न का स्थर								✓		
3) Objective of Question उद्दिष्टानुसार प्रश्न उद्दिष्ट के अनुसार प्रश्न								✓		
i) Knowledge ज्ञान										
ii) Understanding आकलन							✓			
iii) Application उपयोजन								✓		
iv) Skill कौशल्य									✓	

FEEDBACK प्रत्याभरण

Students are able to answers the questions and more curious about the topic.

QUESTIONING SKILL

प्रश्न कौशल्य

OBSERVATION CHART निरीक्षण तक्ता

Time Duration : 5 Minutes

वेळ – ५ मिनिट

Sub Skills उपकौशल्य	1	2	3	4	5	6	7	8	9	10
1) Type of Question प्रश्नाचे प्रकार/प्रश्न के प्रकार								✓		
2) Level of Question प्रश्नाचे स्तर/प्रश्न का स्थर								✓		
3) Objective of Question उद्दिष्टानुसार प्रश्न उद्दिष्ट के अनुसार प्रश्न								✓		
i) Knowledge ज्ञान										
ii) Understanding आकलन										
iii) Application उपयोजन										
iv) Skill कौशल्य										

FEEDBACK प्रत्याभरण

Students are able to tell the examples of quadratic equation. Explain the defination which is previous knowledge

Shalbhade
3/02/2024

EXPLANATION SKILL
स्पष्टीकरण कौशल्य

Sr. No. क्रमांक: 3
Subject विषय: Physics
Teaching अध्यापन: Explanation Skill
Sub – Unit विषयांश: Motion
Re-Teaching पुनर्ध्यापन:
Previous Knowledge पूर्वज्ञान: Types of motion and physical quantities used in motion
Class वर्ग: IX

Explanation Skill स्पष्टीकरण कौशल्य	Sub Skill उपकौशल्य	
TEACHERS ACTIVITY	STUDENTS ACTIVITY	SUB-SK
NOTE: Teacher asked T Uniform motion is one of the category of motion. T Here, uniform motion is defined as the motion of the particle or object from one point to another point with uniform speed. T Let us take an example that car is moving with speed 40km/hr. From A to point B. Here speed is constant which means car is covering equal distance in equal interval of time. T Students are listening or not and concentrate on board.	NOTE: Students answered S Students were listening S Students were writing in their notebooks. S Students think and then give answered. S Students are well attentive.	I Initial stateme Explana Conjuct Audio Visual

EXPLANATION SKILL

स्पष्टीकरण कौशल्य

Sr. No. क्रमांक: 3
Subject विषय: Physics
Teaching अध्यापन: Explanation Skill
Sub – Unit विषयांश: Motion
Re-Teaching पुनर्ध्यापन:
Previous Knowledge पूर्वज्ञान: Types of motion & physical quantities used in motion
Class वर्ग: IX

Explanation Skill स्पष्टीकरण कौशल्य	Sub Skill उपकौशल्य	
T Imagine a train is moving with uniform speed of 20m/s it means that for every second train is covering a distance of 20m	S Students calculating the time from given data by their previous knowledge.	Purposive Recapitul-ation
T Hands of clock always moves with uniform speed thus it is an example of uniform motion. Thats why we use clock for the purpose of measurement of time.	S Students are able to know the use of clock.	
T From the above discussion, what we can conclude is that whenever an object moves with constant speed it perform uniform motion and distance covered in unit time is always same through out the motion.	S Students are able to understand the topic content.	final statemer

EXPLANATION SKILL
स्पष्टीकरण कौशल्य

Sr. No 3 क्रमांक
Subject Mathematics विषय
Teaching Explanation Skill अध्यापन
Sub – Unit Quadratic Equations विषयांश
Re-Teaching पुनर्ध्यापन
Previous Knowledge About polynomial पूर्वज्ञान
Class X वर्ग

Explanation Skill स्पष्टीकरण कौशल्य	Sub Skill उपकौशल्य	
TEACHERS ACTIVITY	STUDENT ACTIVITY	SUB-S
T What is quadratic equation? Equation with the degree of polynomial is 2. Ex. $x^2+4x+4=0$	S Students are listening and very attentive as they were copying from blackboard.	Initi state
T Quadratic equation can be in one variable or two variable. One variable: $x^2+4x+2=0$ Two variable: $x^2+3xy+2=0$		Expla conju
T Now, we have to study quadratic equation in one variable	S Students are concentr-ating on blackboard.	Aud visu

EXPLANATION SKILL
स्पष्टीकरण कौशल्य

Sr. No. 3 क्रमांक
Subject Mathematics विषय
Teaching Explanation Skill अध्यापन
Sub – Unit Quadratic Equations विषयांश
Re-Teaching पुनर्ध्यापन
Previous Knowledge About polynomial पूर्वज्ञान
Class X वर्ग

Explanation Skill स्पष्टीकरण कौशल्य	Sub Skill उपकौशल्य	
[T] What is the solution of quadratic eqⁿ? The value of variables that satisfy the equation is called solution or roots or zero's.	[S] Students writing by teachers dictation.	Purposive Recapitulation
[T] Ex. $x^2+4x+4=0$ verify is $x=-2$ is the solution of given equation Put $x=-2$, $\therefore LHS = x^2+4x+4$ $= (-2)^2+4(-2)+4$ $= 4-8+4$ $= 0$ $\therefore LHS = RHS$ $\therefore x=-2$ is the solution of given equation	[S] Students looking and concentrating on board.	
Thus, by putting various values of variables in given equation.	[S] Students are able to find the solution of the given equation	Final statement

EXPLANATION SKILL
स्पष्टीकरण कौशल्य
OBSERVATION CHART निरीक्षण तक्ता

Time Duration : 5 Minutes — वेळ – ५ मिनिट

Sub Skills उपकौशल्य	1	2	3	4	5	6	7	8	9	10
1) Initial Statement प्रथम विधान							✓			
2) Explanation Conjunction स्पष्टीकरण दुवे							✓			
3) Use of audio - visual दृक्श्राव्य साधनाचा वापर							✓			
4) Purposive Recapitulation योजनापुर्वक पुनरावलोकन योजनापुर्वक पुनरावृत्ती							✓			
5) Final Statement अंतिम विधान							✓			

FEEDBACK प्रत्याभरण

Students are able to understand the concept and noted in their notebooks.

EXPLANATION SKILL
स्पष्टीकरण कौशल्य
OBSERVATION CHART निरीक्षण तक्ता

Time Duration : 5 Minutes

वेळ – ५ मिनि

Sub Skills उपकौशल्य	1	2	3	4	5	6	7	8	9	1
1) Initial Statement प्रथम विधान							✓			
2) Explanation Conjunction स्पष्टीकरण दुवे							✓			
3) Use of audio - visual दृक्श्राव्य साधनाचा वापर							✓			
4) Purposive Recapitulation योजनापुर्वक पुनरावलोकन योजनापुर्वक पुनरावृत्ती							✓			
5) Final Statement अंतिम विधान							✓			

FEEDBACK प्रत्याभरण

Students are ready for doing such types of questions and concentrating on the problems.

Kulbande

STIMULUS VARIATION SKILL

चेतक – बदल कौशल्य/उदिपन भिन्नता

Sr. No. क्रमांक: 4
Subject विषय: Physics
Teaching अध्यापन: Stimulus Variation Skill
Sub – Unit विषयांश: Motion
Re-Teaching पुनर्ध्यापन:
Previous Knowledge पूर्वज्ञान: About motion
Class वर्ग: IX

Stimulus Variation Skill चेतक – बदल कौशल्य	Sub Skill उपकौशल्य	
TEACHERS ACTIVITY	STUDENTS ACTIVITY	SUB-SKILL
NOTE: Teachers asked questions.	NOTE: Students answered properly.	
T As we have studied uniform motion is a motion with constant speed. Is earth is performing uniform motion?	S Yes, because earth completes its one rotation in one year.	Gesture of teacher, Verbal participation of students
T Theoretically, we can say that earth rotate with constant speed. Imagine that speed is changed then what with will happened?	S Time will change for the completion of one rotation around earth and we will not get 365 days in one year.	Active participation of students

STIMULUS VARIATION SKILL

चेतक – बदल कौशल्य/उदिपन भिन्नता

Sr. No. 4 क्रमांक

Subject Physics विषय

Teaching Stimulus Variation Skill अध्यापन

Sub – Unit Motion विषयांश

Re-Teaching पुनर्ध्यापन

Previous Knowledge About motion पूर्वज्ञान

Class IX वर्ग

Stimulus Variation Skill चेतक – बदल कौशल्य	Sub Skill उपकौशल्य	
[T] Explanation about non-uniform motion by taking a fractional examples.	[S] Students listening the examples	Movement of teacher
[T] If speed varies with time then the motion is non-uniform motion.		
[T] What happens when we drive on road having heavy traffics, our speed varies every second it means that we are not moving with constant speed thus they have to perform non-uniform motion.	[S] Student eagerly waiting for the response of teacher.	Change in speech pattern

STIMULUS VARIATION SKILL

चेतक – बदल कौशल्य/उदिपन भिन्नता

Sr. No. 4 क्रमांक

Subject Mathematics विषय

Teaching Stimulus Variation Skill अध्यापन

Sub – Unit Quadratic Equation विषयांश

Re-Teaching पुनर्ध्यापन

Previous Knowledge About quadratic equation पूर्वज्ञान

Class X वर्ग

Stimulus Variation Skill चेतक – बदल कौशल्य	Sub Skill उपकौशल्य	
TEACHERS ACTIVITY	STUDENTS ACTIVITY	SUB-SKILL
NOTE: Teacher asked questions.	NOTE: Students answered properly.	
[T] We will study methods for finding the roots of given equation.	[S] Students are trying to factorize according to their previous knowledge.	Gesture of teacher
[T] There are three methods for finding the roots. a) factorization b) Perfect square method c) formula method	[S] Students are copying from the board	Movement of teacher
[T] What is the factor of $x^2+4x+4=0$	[S] Students answered $(x+2)$ is the the factor of $x^2+4x+4=0$	Verbal participation of students
[T] In factorization method, we have to find the factors of middle term.		

STIMULUS VARIATION SKILL

चेतक – बदल कौशल्य/उदिपन भिन्नता

Sr. No. 4 क्रमांक

Subject Mathematics विषय

Teaching Stimulus Variation Skill अध्यापन

Sub – Unit Quadratic Equation विषयांश

Re-Teaching पुनर्ध्यापन

Previous Knowledge About quadratic equation पूर्वज्ञान

Class X वर्ग

Stimulus Variation Skill चेतक – बदल कौशल्य	Sub Skill उपकौशल्य	
[T] Ex. $x^2+4x+4=0$ product $=1\times4=+4$ $x^2+2x+2x+4=0$ Sum of middle term $=+4$ ($+2$, $+2$) $x(x+2)+2(x+2)=0$ $(x+2)(x+2)=0$ $x+2=0$ or $x+2=0$ $x=-2$ or $x=-2$ Here, $(x+2)$ is a factor and $x=-2$ is the solution.	[S] Students give response about multiplication and addition.	Change in speech pattern
[T] Ex. $x^2-4x+4=0$ Product $=1\times4=4$ $x^2-2x-2x+4=0$ Sum of middle term $=-4$ (-2, -2) $x(x-2)-2(x-2)=0$ $(x-2)(x-2)=0$ $x-2=0$ or $x-2=0$ $x=2$ or $x=2$ Here, $(x-2)$ is the factor and $x=2$ is the solution.	[S] Students are trying to solve the question.	Change in Stimulus variation

STIMULUS VARIATION SKILL

चेतक – बदल कौशल्य/उदिपन भिन्नता

OBSERVATION CHART निरीक्षण तक्ता

Time Duration : 5 Minutes

वेळ – ५ मिनिट

Sub Skills उपकौशल्य	1	2	3	4	5	6	7	8	9	10
1) Movement of Teacher शिक्षक हालचाल / विधाऐ								✓		
2) Gesture of Teacher शिक्षक हावभाव								✓		
3) Change in stimulus variation चेतक बदल/उदिपन भिन्नता							✓			
4) Change in Speech Pattern भाषा शैलीत परिवर्तन भाषा शैली में परिवर्तन							✓			
5) Verbal participation of students विद्यार्थ्यांचा शाब्दिक सहभाग छात्र का शाब्दिक सहभाग								✓		
6) Active Participation of Students विद्यार्थ्यांचा सक्रिय सहभाग छात्र का सहभाग								✓		

FEEDBACK प्रत्याभरण

Students are listening and able to think by theoretic data. Students taking interest.

STIMULUS VARIATION SKILL

चेतक – बदल कौशल्य/उदिपन भिन्नता

OBSERVATION CHART निरीक्षण तक्ता

Time Duration : 5 Minutes

वेळ – ५ मिनिट

Sub Skills उपकौशल्य	1	2	3	4	5	6	7	8	9	10
1) Movement of Teacher शिक्षक हालचाल / विद्याऐ								✓		
2) Gesture of Teacher शिक्षक हावभाव								✓		
3) Change in stimulus variation चेतक बदल/उदिपन भिन्नता							✓			
4) Change in Speech Pattern भाषा शैलीत परिवर्तन भाषा शैली में परिवर्तन							✓			
5) Verbal participation of students विद्यार्थ्यांचा शाब्दिक सहभाग छात्र का शाब्दिक सहभाग								✓		
6) Active Participation of Students विद्यार्थ्यांचा सक्रिय सहभाग छात्र का सहभाग									✓	

FEEDBACK प्रत्याभरण

Students are satisfying with the questions and want more questions as a homework.

Kalbande

BLACKBOARD WRITING SKILL

फलक लेखन कौशल्य

Sr. No. 5 क्रमांक

Subject Physics विषय

Teaching Blackboard writing skill अध्यापन

Sub – Unit Motion विषयांश

Re-Teaching पुनर्ध्यापन

Previous Knowledge About types of motion पूर्वज्ञान

Class IX वर्ग

Black Board Writing Skill फलक लेखन कौशल्य	Sub Skill उपकौशल्य	
TEACHERS ACTIVITY	STUDENTS ACTIVITY	SUB-SKILL
1 Teaching Points 1) Definition of motion 2) Types of motion: a) Linear motion b) Angular motion c) Vibrational motion 3) Category: a) Uniform motion b) Non-uniform motion 4) Examples:	S Students are listening and written all the definitions from blackboard.	

BLACKBOARD WRITING WORK

फलक लेखन कार्य

Date: 16.12.23

SKILL: BLACKBOARD WRITING

SUBJECT: PHYSICS

TOPIC: MOTION

Total-58
Present-54
Absent-04

Teaching points:

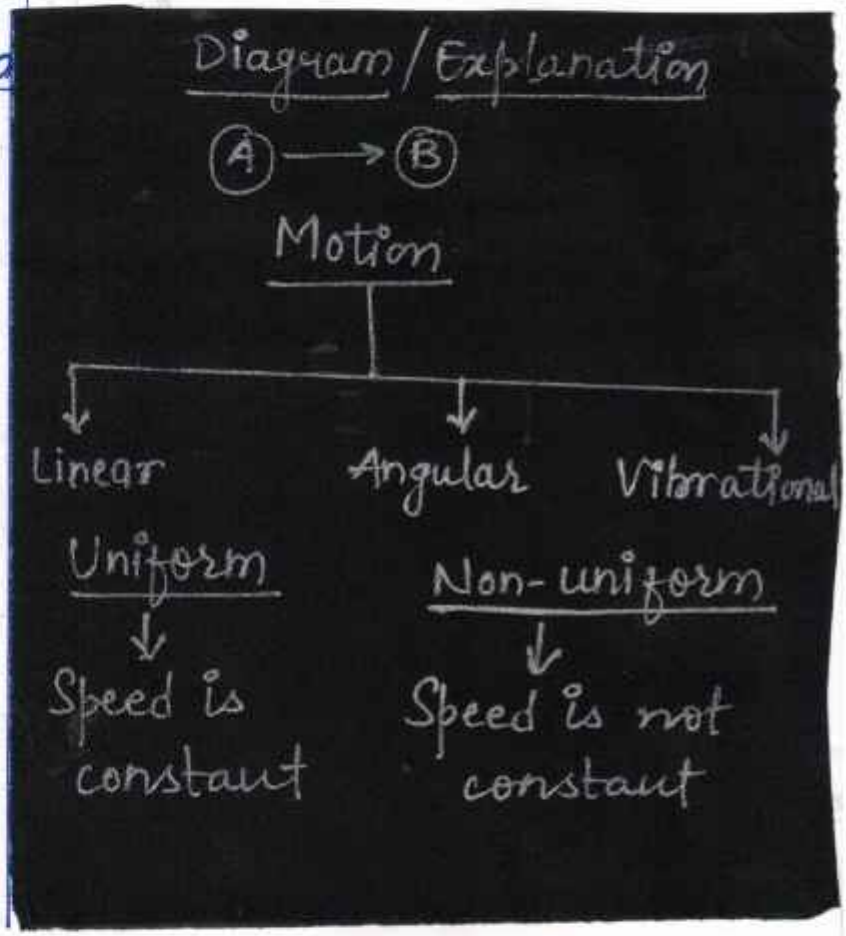
1) Definition of motion

2) Types of motion:
   a) Linear motion
   b) Angular motion
   c) Vibrational motion

3) Category:
   a) Uniform
   b) Non-uniform

4) Examples

Diagram / Explanation



HOMEWORK:

1) Write 3 examples of uniform and non-uniform motion.

2) What is displacement?

BLACKBOARD WRITING SKILL

फलक लेखन कौशल्य

Sr. No. 5
क्रमांक

Teaching Blackboard Writing Skill
अध्यापन

Re-Teaching
पुनर्ध्यापन

Subject Mathematics
विषय

Sub – Unit Quadratic equation
विषयांश

Previous Knowledge About quadratic equation
पूर्वज्ञान

Class X
वर्ग

Black Board Writing Skill फलक लेखन कौशल्य	Sub Skill उपकौशल्य	
TEACHERS ACTIVITY	STUDENTS ACTIVITY	SUB-SKILL
Teaching points: 1) Definition of equation 2) Types of equation a) Linear equation b) Quadratic equation c) Cubic equation d) Polynomial equation 3) Category of equation a) Single variable equation b) Two variable equation 4) Examples:	[S] Students are concentrating towards the board and copying the questions from the board.	

BLACKBOARD WRITING WORK

फलक लेखन कार्य

SKILL: BLACKBOARD WRITING

SUBJECT : MATHEMATICS

TOPIC : QUADRATIC EQUATION

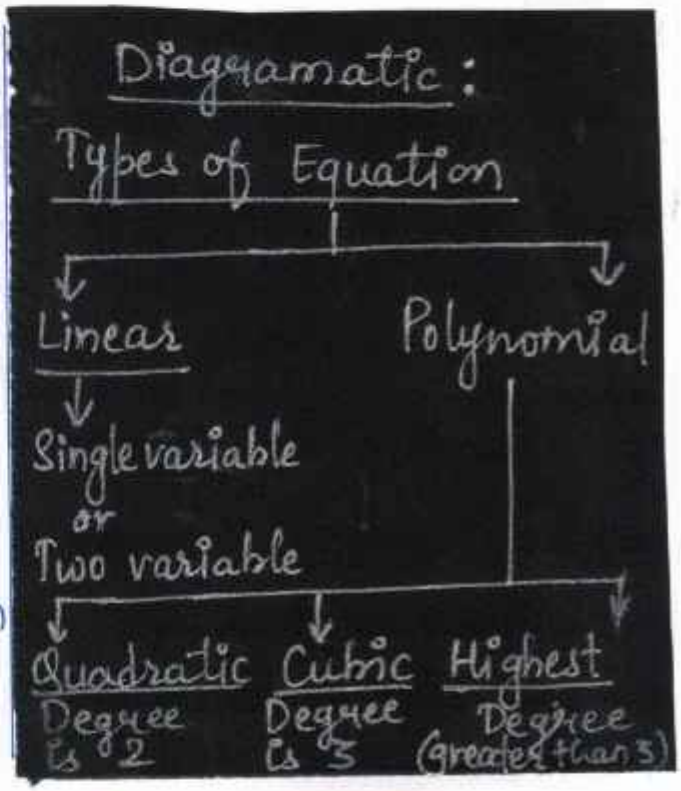
Teaching points:

1) Definition of equation

2) Types of equation:
   a) Linear equation
   b) Quadratic equation
   c) Cubic equation
   d) Polynomial equation

3) Category of equation
   a) Single variable equation
   b) Two variable equation

Diagramatic:



4) Examples:
   a) Single variable : $x+y=0$ (Degree one)
   OR two variable: $3x=0$, $9y=0$ (Linear)
   b) Two variables : $x^2+xy+y^2=0$ (Quadratic)

HOMEWORK:

a) Write 5 examples of lineas equation.

b) Write 5 examples of quadratic equation.

INSPECTION
निरीक्षण तक्ता

BLACK BOARD WRITING / कौशल्य – फलक लेखन

अ) सुवाच्य लेखन

क्रम	उपघटक	पदनिश्चयन श्रेणी चढत्या क्रमाने				
		1	2	3	4	5
1	प्रत्येक अक्षर स्पष्ट					✓
2	दोन अक्षरांमधील योग्य अंतर					✓
3	दोन शब्दांमधील योग्य अंतर					✓
4	अक्षरांचे योग्य वळण				✓	
5	अक्षरांचा योग्य आकार					✓

ब) फलक लेखनातील व्यवस्थितपणा

क्रम	उपघटक	1	2	3	4	5
1	सरळ ओळीत लेखन				✓	
2	दोन ओळींमधील योग्य अंतर					✓
3	लेखन शुध्दता					✓
4	योग्य नियोजन					✓

क) योग्य लेखी काम

क्रम	उपघटक	1	2	3	4	5
1	योग्य मुद्यांची योग्य गुंफण				✓	
2	लेखनातील आटोपशीरपणा				✓	
3	अवधान क्लृप्त्यांचा उपयोग					✓
4	सर्व मुख्य मुद्यांचा समावेश					✓

FEEDBACK प्रत्याभरण

Students are trying to understand the blackboard skill of quadratic equations and trying to solve the numericals.

INSPECTION

निरीक्षण तक्ता

BLACK BOARD WRITING / कौशल्य – फलक लेखन

अ) सुवाच्य लेखन

क्रम	उपघटक	पदनिश्चयन श्रेणी चढत्या क्रमाने				
		1	2	3	4	5
1	प्रत्येक अक्षर स्पष्ट					✓
2	दोन अक्षरांमधील योग्य अंतर					✓
3	दोन शब्दांमधील योग्य अंतर				✓	
4	अक्षरांचे योग्य वळण				✓	
5	अक्षरांचा योग्य आकार					✓

ब) फलक लेखनातील व्यवस्थितपणा

क्रम	उपघटक	1	2	3	4	5
1	सरळ ओळीत लेखन				✓	
2	दोन ओळींमधील योग्य अंतर					✓
3	लेखन शुध्दता					✓
4	योग्य नियोजन				✓	

क) योग्य लेखी काम

क्रम	उपघटक	1	2	3	4	5
1	योग्य मुद्यांची योग्य गुंफण				✓	
2	लेखनातील आटोपशीरपणा					✓
3	अवधान क्लृप्त्यांचा उपयोग				✓	
4	सर्व मुख्य मुद्यांचा समावेश					✓

FEEDBACK प्रत्याभरण

Students are trying to understand the blackboard skill on the topic motion and trying to get perfection in writing and understanding.

Feedback

REINFORCEMENT SKILL
प्रबलन कौशल्य/पुनर्बलन कौशल्य

Sr. No. 7 क्रमांक
Subject Physics विषय
Teaching Reinforcement Skill अध्यापन
Sub – Unit Motion विषयांश
Re-Teaching पुनर्ध्यापन
Previous Knowledge Types of motion पूर्वज्ञान
Class IX वर्ग

Reinforcement Skill प्रबलन कौशल्य/पुनर्बलन कौशल्य	Sub Skill उपकौशल्य	
TEACHERS ACTIVITY	STUDENTS ACTIVITY	SUB-SKILL
NOTE: TEACHER Asked question.	NOTE: Student answered.	
[T] What is momentum?	[S] Momentum is rate of change of displa-cement with respect to time and the multiplication of mass with it.	Acceptance
[T] Very Good.		Verbal motivation,
[T] Very good, you have given a perfect answer (Smile on face)		Motivation through expression.
[T] (Some hint given) i.e. System at rest or in motion.	[S] The system that is in motion have momentum.	Motivate to create thinking power.

REINFORCEMENT SKILL

प्रबलन कौशल्य/पुनर्बलन कौशल्य

Sr. No. 7 क्रमांक
Subject Physics विषय
Teaching Reinforcement Skill अध्यापन
Sub – Unit Motion विषयांश
Re-Teaching पुनर्ध्यापन
Previous Knowledge Types of motion पूर्वज्ञान
Class IX वर्ग

Reinforcement Skill प्रबलन कौशल्य/पुनर्बलन कौशल्य	Sub Skill उपकौशल्य	
T (Student name) Can you tell me the difference between the body at rest (system) and system in motion?	S The system which is in motion, it has velocity and its mass gives the momentum and the velocity of the system at rest will be zero.	Motivate students by announcing their name.
T Very good, how many types of motion are there?	S There are three main types of motion: a) Translational motion b) Angular motion c) Vibrational motion	Motivate students for participation

REINFORCEMENT SKILL

प्रबलन कौशल्य/पुनर्बलन कौशल्य

Sr. No. 7 क्रमांक

Subject Mathematics विषय

Teaching Reinforcement Skill अध्यापन

Sub – Unit Quadratic equation विषयांश

Re-Teaching पुनर्ध्यापन

Previous Knowledge Types of equation पूर्वज्ञान

Class X वर्ग

Reinforcement Skill प्रबलन कौशल्य/पुनर्बलन कौशल्य	Sub Skill उपकौशल्य	
TEACHERS ACTIVITY	STUDENTS ACTIVITY	SUB-SKILL
TE: Teaches asked questions. What is equation?	NOTE: Students answered S Two or more quantities can be expressed in terms of mathem-atical notation, i.e. +, −, × or ÷ called as equation. These quantities are equal to zero or some constant.	Acceptance
]Very good, I'm impressed!		Verbal motivation
]What is quadratic equation?	S Equation which has power 2 i.e. degree is 2. Ex. (a) $x^2+xy+y^2=0$ (b) $3x^2+xy+2=0$	Motivation through expression Create the thinking power among the students.

REINFORCEMENT SKILL

प्रबलन कौशल्य/पुनर्बलन कौशल्य

Sr. No. 1 क्रमांक

Subject Mathematics विषय

Teaching Reinforcement Skill अध्यापन

Sub – Unit Quadratic equation विषयांश

Re-Teaching ..... पुनर्ध्यापन

Previous Knowledge Types of equation पूर्वज्ञान

Class X वर्ग

Reinforcement Skill प्रबलन कौशल्य/पुनर्बलन कौशल्य	Sub Skill उपकौशल्य	
[T] Do you know about cubic equation?	[S] The equation which has power 3. i.e. degree is 3. Ex. $x^3+xy^2+3y^2=0$ $3xy^2+4x^2y+z^3=5$	Increase and create the curiosity power.
[T] Very good. Can you tell me about higher degree equation?	[S] When an equation has two or more than two power (or degree) it is called as polynomial equation.	Motivate the student to increase the thinking power.

REINFORCEMENT SKILL

प्रबलन कौशल्य/पुनर्बलन कौशल

OBSERVATION CHART निरीक्षण तक्ता

Time Duration : 5 Minutes

वेळ – ५ मिनिट

Sub Skills उपकौशल्य	1	2	3	4	5	6	7	8	9	10
1) Acceptance स्वीकृती									✓	
2) Verbal Motivation शाब्दिक प्रशंसा										✓
3) Motivate through expression अशाब्दिक प्रशंसा										✓
4) Motivate students by announcing their name व्यक्तिवाचक उल्लेख									✓	
5) Motivate students for participation सहभागी होण्यास इतर विद्यार्थ्यांना प्रोत्साहन										✓

FEEDBACK प्रत्याभरण

Students are trying to understand and get motivated through the reinforcement skill. Also trying to get perfection in writing examples and telling orally as well as understanding about motion topic of physics.

REINFORCEMENT SKILL

प्रबलन कौशल्य/पुनर्बलन कौशल

OBSERVATION CHART निरीक्षण तक्ता

Time Duration : 5 Minutes

वेळ – ५ मिनिट

Sub Skills उपकौशल्य	1	2	3	4	5	6	7	8	9	10
1) Acceptance स्वीकृती									✓	
2) Verbal Motivation शाब्दिक प्रशंसा										✓
3) Motivate through expression अशाब्दिक प्रशंसा										✓
4) Motivate students by announcing their name व्यक्तिवाचक उल्लेख									✓	
5) Motivate students for participation सहभागी होण्यास इतर विद्यार्थ्यांना प्रोत्साहन										✓

FEEDBACK प्रत्याभरण

Students are trying to understand the reinforcement skill of mathematics on the topic quadratic equation and also trying to get perfection in their skills and writing examples.

✓

Shilpa Bonde

ILLUSTRATING WITH EXAMPLES

उदाहरण व दाखल्यांचा वापर/दृष्टान्तीकरण उदाहरणासहित

Sr. No. ... 8 ..... Subject ... Physics .....
क्रमांक विषय

Teaching ... Illustrating with examples ... Sub – Unit ... Motion .....
अध्यापन विषयांश

Re-Teaching .....
पुनर्ध्यापन

Previous Knowledge ... Types of motion .....
पूर्वज्ञान

Class ... IX .....
वर्ग

Illustrating with examples उदाहरण व दाखल्यांचा वापर/दृष्टान्तीकरण उदाहरणासहित	Sub Skill उपकौशल्य	
TEACHERS ACTIVITY	STUDENT ACTIVITY	SUB-SKILL
NOTE: Teacher asked question. [T] What is motion?	NOTE: Students answered properly. [S] (Another student) motion is mathematically described in terms of displacement, distance velocity, acceleration time and speed.	Interesting explanation as per age.
	[S] Motion is change in position of an object with time.	Example related with content.
[T] Can you tell me about objects motion?	[S] An objects motion cannot change unless it is acted upon by a force, as described.	Gave actual phenomenon

ILLUSTRATING WITH EXAMPLES

उदाहरण व दाखल्यांचा वापर/दृष्टान्तीकरण उदाहरणासहित

Sr. No. 8 क्रमांक
Subject Physics विषय
Teaching Illustrating with examples अध्यापन
Sub – Unit Motion विषयांश
Re-Teaching पुनर्ध्यापन
Previous Knowledge Types of motion पूर्वज्ञान
Class IX वर्ग

Illustrating with examples उदाहरण व दाखल्यांचा वापर/दृष्टान्तीकरण उदाहरणासहित	Sub Skill उपकौशल्य	
[T] Tell me some examples of motion?	[S] When body is in motion or steady state, then this object remains in its state unless external force act on it.	Good explanation of example.
[T] How will measure the motion?	[S] Acceleration is a measure of how much velocity of object changes in a certain time.	Various types of discussion being done with examples.
[T] Can you tell me laws of motion?	[S] There are three laws of motion a) Newton's first law of motion b) Newton's second law of motion c) Newton's third law of motion	Involvement of student Motive achieved

ILLUSTRATING WITH EXAMPLES

उदाहरण व दाखल्यांचा वापर/दृष्टान्तीकरण उदाहरणासहित

Sr. No. 8 क्रमांक
Subject Mathematics विषय
Teaching Illustrating with examples अध्यापन
Sub – Unit Quadratic equation विषयांश
Re-Teaching पुनर्ध्यापन
Previous Knowledge Cubic equation पूर्वज्ञान
Class X वर्ग

Illustrating with examples उदाहरण व दाखल्यांचा वापर/दृष्टान्तीकरण उदाहरणासहित	Sub Skill उपकौशल्य	
TEACHERS ACTIVITY	STUDENTS ACTIVITY	SUB-SKILL
NOTE: Teacher asked question.	NOTE: Students answered properly.	
[T] What is quadratic equation?	[S] Equation has only degree two is called quadratic equation	
[T] Can you tell me some examples?	[S] There are following examples: (a) $x^2+xy+y^2+5z^2=0$ (b) $p^2+9pq+q^2=9$ where, x, y, z, p and q are variables in equation. [S] (Another Student) Ex. $t^2+5qt+9q^2=0$ [S] Is this, equation quadratic?	Example related with content Example as per age Various types of examples.

ILLUSTRATING WITH EXAMPLES

उदाहरण व दाखल्यांचा वापर/दृष्टान्तीकरण उदाहरणासहित

Sr. No. क्रमांक: 8 | Subject विषय: Mathematics

Teaching अध्यापन: Illustrating with examples | Sub – Unit विषयांश: Quadratic equation

Re-Teaching पुनर्ध्यापन: ..... | Previous Knowledge पूर्वज्ञान: Cubic equation

Class वर्ग: X

Illustrating with examples उदाहरण व दाखल्यांचा वापर/दृष्टान्तीकरण उदाहरणासहित	Sub Skill उपकौशल्य	
T If 'q' is variable then this is quadratic equation and if 'q' is constant then it is not a quadratic equation.		
T In quadratic equation, there must be a power or addition of power should be equal to two (2). i.e. $x^1y^1 \Rightarrow 1+1=2$ or $x^2 \longrightarrow$ power $= 2$	S x^2y is not quadratic equation term. It is a cubic equation term.	Various types of examples Involvement of students
T Can you tell me some quadratic equation terms with examples?	S $5xq$, $3xy$, $3y^2$, $4t^2$, etc. where, x, q, y, s, t are all variables.	Motive achieved

ILLUSTRATING WITH EXAMPLES

उदाहरण व दाखल्यांचा वापर / दृष्टान्तीकरण उदाहरणसहित

OBSERVATION CHART निरीक्षण तक्ता

Time Duration : 5 Minutes

वेळ – ५ मिनिट

Sub Skills उपकौशल्य	Rating Scale पदनिश्चयन श्रेणी				
	Lower निम्न	Medium मध्यम	Satisfactory सुयोग्य	Good उत्कृष्ट	Excellent अत्युत्कृष्ट
1) Examples related with content पाठ्यवस्तूस पोषक उदाहरणे					✓
2) Examples as per age वयानुरूप योग्य उदाहरणे				✓	
3) Interesting examples मनोवेदक उदाहरणे					✓
4) Various types of examples विविध प्रकारची उदाहरणे				✓	
5) Number of examples उदाहरणांची संख्या					✓
6) Involvement of students विद्यार्थी सहभाग					✓
7) Motive achieved उद्दिष्ट पूर्ती					✓

FEEDBACK प्रत्याभरण

Students are trying to understand illustrating with examples on the topic motion taken from physics. Students also get perfection in their skills and as well as understanding.

ILLUSTRATING WITH EXAMPLES

उदाहरण व दाखल्यांचा वापर / दृष्टान्तीकरण उदाहरणसहित

OBSERVATION CHART निरीक्षण तक्ता

Time Duration : 5 Minutes

वेळ – ५ मिनिट

Sub Skills उपकौशल्य	Rating Scale पदनिश्चयन श्रेणी				
	Lower निम्न	Medium मध्यम	Satisfactory सुयोग्य	Good उत्कृष्ट	Excellent अत्युत्कृष्ट
1) Examples related with content पाठ्यवस्तूस पोषक उदाहरणे					✓
2) Examples as per age वयानुरूप योग्य उदाहरणे				✓	
3) Interesting examples मनोवेदक उदाहरणे				✓	
4) Various types of examples विविध प्रकारची उदाहरणे					✓
5) Number of examples उदाहरणांची संख्या				✓	
6) Involvement of students विद्यार्थी सहभाग				✓	
7) Motive achieved उद्दिष्ट पूर्ती					✓

FEEDBACK प्रत्याभरण

Students are trying to understand the topic quadratic equation taken from mathematics by illustrating with examples. Students also get perfection in writing examples and understanding the topic.

Shalini

CLOSURE SKILL

समारोप कौशल्य / समाप्ति कौशल

Sr. No. 9 क्रमांक
Subject Physics विषय
Teaching Closure Skill अध्यापन
Sub – Unit Motion (Revision) विषयांश
Re-Teaching पुनर्ध्यापन
Previous Knowledge Laws of motion पूर्वज्ञान
Class IX वर्ग

Closure Skill समारोप कौशल्य/समाप्ति कौशल	Sub Skill उपकौशल्य	
TEACHERS ACTIVITY	STUDENTS ACTIVITY	SUB-SKILL
NOTE: Teacher asked questions.	NOTE: Students answered properly.	
[T] We learnt about motion and its types.		Recalling of topic & recollecting of content.
[T] Can anyone tell me, what are the types of motion?	[S] There are mainly three types of motion	
[T] What are these types?	[S] a) Translational motion b) Rotational motion c) Vibrational motion	Recapitula-tion

CLOSURE SKILL

समारोप कौशल्य / समाप्ति कौशल

Sr. No. क्रमांक: 9
Subject विषय: Physics
Teaching अध्यापन: Closure Skill
Sub – Unit विषयांश: Motion (Revision)
Re-Teaching पुनर्ध्यापन:
Previous Knowledge पूर्वज्ञान: laws of motion
Class वर्ग: IX

Closure Skill समारोप कौशल्य/समाप्ति कौशल	Sub Skill उपकौशल्य	
[T] What is translational motion?	[S] Motion of body along a linear path is called translational motion.	
[T] What is rotational motion?	[S] Motion of body along a circular path is called rotational motion.	
[T] What is vibrational motion?	[S] Motion of body along a to-fro and up-down is called vibrational motion.	
[T] We will further study about laws of motion.		Connect gained knowledge with future.

CLOSURE SKILL

समारोप कौशल्य / समाप्ति कौशल

Sr. No. क्रमांक: 9

Subject विषय: Mathematics

Teaching अध्यापन: Closure Skill

Sub – Unit विषयांश: Quadratic Equation (Revision)

Re-Teaching पुनर्ध्यापन:

Previous Knowledge पूर्वज्ञान: Quadratic equation (example)

Class वर्ग: X

Closure Skill समारोप कौशल्य/समाप्ति कौशल	Sub Skill उपकौशल्य	
TEACHERS ACTIVITY	STUDENTS ACTIVITY	SUB-SKILL
NOTE: Teacher asked questions.	NOTE: Students answered properly.	
[T] We learnt about quadratic equation.		Recollection of topic
[T] What is meant by a quadratic equation?	[S] Equation in which powers or addition of powers of variable is equal to two then it is called quadratic equation.	Recapitulation
[T] Can you tell me some example of it?	[S] ① $x^2+xy+y^2=$ constant ② $t^2+9tq+q^2=0$ ③ $3p^2+7q^2+4pq=5$	

CLOSURE SKILL

समारोप कौशल्य / समाप्ति कौशल

Sr. No. क्रमांक: 9
Subject विषय: Mathematics
Teaching अध्यापन: Closure Skill
Sub – Unit विषयांश: Quadratic equation (Revision)
Re-Teaching पुनर्ध्यापन:
Previous Knowledge पूर्वज्ञान: Quadratic equation (Examples)
Class वर्ग: X

Closure Skill समारोप कौशल्य/समाप्ति कौशल	Sub Skill उपकौशल्य	
T Identify the following quadratic terms/ equations: (a) (b) (c) (d)	S Equation (a) is not quadratic and (b), (c), (d) are quadratic equation.	Evaluation of the content.
T Ex. xy, Is it quadratic term?	S xy is quadratic term if x and y are both variable	
T We will further study about other types of quadratic equation.		Connect gained knowledge with future

CLOSURE SKILL
समारोप कौशल्य / समाप्ति कौशल

OBSERVATION CHART
निरीक्षण तक्ता

Time Duration : 5 Minutes

वेळ – ५ मिनिट

उपघटक	पदनिश्चयन श्रेणी (चढत्या क्रमांक)				
	1	2	3	4	5
1) Recollection of the content मुद्द्यांचे एकत्रीकरण मुद्दों का एकत्रीकरण				✓	
2) Recapitulation पुनरावलोकन करणे पुनरावलोकन करना					✓
3) Evaluation of the content अध्यापन केलेल्या पाठ्यांशाचे मूल्यमापन अध्यापन किए पाठों का मूल्यमापन					✓
4) Connect gained knowledge with future. प्राप्त ज्ञानाचा भावी अध्ययनाशी संबंध जोडणे. प्राप्त ज्ञान का भावी अध्ययन से संबंध स्थापित करना।					✓

FEEDBACK प्रत्याभरण

Students learnt about the previous content, try to recapitulate and recollect the previous content and also gained knowledge with future of the topic from physics.

✓

CLOSURE SKILL
समारोप कौशल्य / समाप्ति कौशल

OBSERVATION CHART
निरीक्षण तक्ता

Time Duration : 5 Minutes

वेळ – ५ मिनिट

उपघटक	पदनिश्चयन श्रेणी (चढत्या क्रमांक)				
	1	2	3	4	5
1) Recollection of the content मुद्द्यांचे एकत्रीकरण मुद्दों का एकत्रीकरण				✓	
2) Recapitulation पुनरावलोकन करणे पुनरावलोकन करना					✓
3) Evaluation of the content अध्यापन केलेल्या पाठ्यांशाचे मूल्यमापन अध्यापन किए पाठों का मूल्यमापन					✓
4) Connect gained knowledge with future. प्राप्त ज्ञानाचा भावी अध्ययनाशी संबंध जोडणे. प्राप्त ज्ञान का भावी अध्ययन से संबंध स्थापित करना।					✓

FEEDBACK प्रत्याभरण

Students felt the topic is very easy after recollecting and recapitulating the previous content learnt in the class. Also got future ideas related to the topic by connect gained knowledge with future.

Kulbode

SHEELA MULTIPURPOSE SOCIETY

SHEELADEVI COLLEGE OF EDUCATION

DATTAWADI, WADI, NAGPUR

2023 - 2024

LESSON PLANNING BOOK
पाठ नियोजन पुस्तिका

Name: Ketaki Shrikant Ohale
नाव:

Number: _____
कमांक:

Subject: 1) Mathematics
विषय:

2) _____

अनुक्रमणिका
INDEX

पाठांक S.No.	दिनांक Date	शाळा School	वर्ग Class	विषय Subject	विषयांक Topic	स्वाक्षरी Signature
1	16/09	V.L Convent	IX	Maths	Rational and Irrational numbers	Shalbande
2	19/09	—11—	IX	Maths	operations on Real numbers	Shalbande
3	23/09	—11—	IX	Maths	Heron's Formula	Shalbande
4	26/09	—11—	IX	Maths	Polynomials	Shalbande
5	05/10	—11—	IX	Maths	Zeros of a polynomial	Shalbande
6	09/10	—11—	IX	Maths	co-ordinate geometry	Shalbande
7	11/10	—11—	IX	Maths	Euclid's Geometry	Shalbande
8	13/10	—11—	IX	Maths	Lines and Angles	Shalbande
9	17/10	—11—	IX	Maths	Triangles - congruence criterions	Shalbande

अनुक्रमणिका
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पाठांक S.No.	दिनांक Date	शाळा School	वर्ग Class	विषय Subject	विषयांक Topic	स्वाक्षरी Signature
10	20/10	— 11 —	IX	Maths	Quadrilaterals	Shalbanda
11	25/10	— 11 —	IX	Maths	circle and its parts	Shalbanda
12	27/10	— 11 —	IX	Maths	Surface area of cube, cuboid, cone, sphere	Shalbanda
13	31/10	— 11 —	IX	Maths	volume of cube cuboid, cone, sphere	Shalbanda
14	20/11	— 11 —	VIII	Maths	Square and square roots	Shalbanda
15	22/11	— 11 —	VIII	Maths	cube and cube roots	Shalbanda
16	24/11	— 11 —	VIII	Maths	Direct and inverse proportions	Shalbanda
17	25/11	— 11 —	VIII	Maths	comparing quantities	Shalbanda
18	21/12	— 11 —	VIII	Maths	Linear equation in one variable	Shalbanda

अनुक्रमणिका
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अनुक्रमांक S.No.	दिनांक Date	शाळा School	वर्ग Class	विषय Subject	विषयांक Topic	स्वाक्षरी Signature
3	22/12	— 11 —	IX	Maths	Linear equation in two variables	Kalpana
20	23/12	— 11 —	IX	Maths	statistics	Kalpana

पाठांक S.No. 1

विषय Subject Mathematics

शाळा School V.L. Convent

विषयांश Topic Rational and Irrat

पाठ साहित्य Material Aids Chalk, Blackboard, Duster, chart showing Number system

पूर्व ज्ञान Previous Knowledge Whole numbers, Nat

पाठाच्या पायऱ्या Steps of the Lesson	अध्यापन मुद्दे Teaching Points	उद्दिष्टे व विशिष्टके Objectives with Specification
INTRODUCTION	1] Rational Numbers	*] To enable students to identify Rational and Irrational Numbers
	2] Irrational Numbers	*] To enable students to differentiate between Rational and Irrational Numbers
	3] Real Numbers	*] To understand Number system and differentiate between the set of numbers
Statement of Aim - Today, we are going to		

दिनांक Date 16/09/23

Natural Numbers — वर्ग Class IX th

Natural numbers, Integers — तासिका अवधी Length of the Period 35 min

अध्यायनानुभव Learning Experience

अध्यापक कृती Teacher's Activities	छात्र कृती Student's Activities
Teacher ask some introductory questions	students give satisfactory answers to the asked questions
Q 1] What are natural numbers?	Ans] The counting numbers from 1, 2, 3, 4 - - are called natural numbers
Q 2] What are whole numbers?	Ans] Whole numbers are the collection of positive numbers with zero. 0, 1, 2, 3, 4 - - - -
Q 3] What are integers?	Ans] The collection of whole numbers with zero, and negative numbers - - - 2, -1, 0, 1, 2 - - - -
learn about Rational and Irrational Numbers	

पाठाच्या पायऱ्या (Steps of Lesson)	अध्यापन मुद्दे (Teaching Points)	उद्दिष्टे व स्पष्टीकरणे (Objectives with Specification)
PRESENTATION	**Rational Numbers -** The numbers in the form of $\frac{m}{n}$ are called rational numbers. Where, m and n are integers $n \neq 0$. **Examples -** -25 is a rational number, because it can be written in the form of $\frac{m}{n}$ as $\frac{-25}{1}$. **Decimal Expansion -** The decimal expansion of rational numbers is either terminating or non-terminating, recurring. 0.687, $1.272727\ldots = 1.\overline{27}$	1] **Knowledge -** Students are able to know the concept of Rational numbers. 2] **Understanding -** Students are able to understand various rational numbers 3] **Application -** Student are able to apply concept of rational numbers to various examples.

अध्ययनानुभव (Learning Experience)	
शिक्षक कृती (Teacher Activity)	विद्यार्थी कृती (Student Activity)
Teachers ask some questions related to the topic.	Students give appropriate answers to the asked questions.
Q.1] What are Rational numbers?	Ans] When a number can be written in the form of $\frac{m}{n}$ where m, n are integers and $n \neq 0$ are rational numbers.
Q.2] Give any two examples of rational numbers.	Ans] $6, \frac{7}{6}, \frac{8}{6}, \frac{12}{6}, \frac{15}{3}, \frac{-19}{4}$ are examples of some rational numbers.
Q.3] How many rational numbers are there between any given two rational numbers?	Ans] There are infinitely many rational numbers between any given two rational numbers.
Q.4] Find three rational numbers between 6 and 7.	Ans] $3+1=4$ $6 \times \frac{4}{4} = \frac{24}{4}$ $\quad 7 \times \frac{4}{4} = \frac{28}{4}$ Three numbers between 6 and 7 are $\left[\frac{25}{4}, \frac{26}{4}, \frac{27}{4}\right]$

पाठाच्या पायऱ्या (Steps of Lesson)	अध्यापन मुद्दे (Teaching Points)	उद्दिष्टे व स्पष्टीकरणे (Objectives with Specification)
	Irrational Numbers - The numbers which cannot be written in the form of $\frac{m}{n}$ where, m and n are integers and $n \neq 0$ **Examples -** $\sqrt{2}, \sqrt{3}, \sqrt{15}, \pi$ are some of the examples of irrational numbers. **Decimal Expansion -** The decimal expansion of irrational numbers is non-terminating and non-recurring $\sqrt{2} = 1.4142135\ldots$ $\pi = 3.14159265\ldots$	1] **Knowledge -** Students are able to know the concept of Irrational numbers 2] **Understanding** students are able to understand various Irrational Numbers 3] **Application -** students are able to apply the concept of Irrational numbers to various example

अध्ययनानुभव (Learning Experience)	
शिक्षक कृती (Teacher Activity)	विद्यार्थी कृती (Student Activity)
Teachers ask some questions related to the topic	students give appropriate answers to the asked questions.
Q.1] What are irrational numbers ?	Ans] The numbers which cannot be written in the form of $\frac{m}{n}$ where m, n are integers and $n \neq 0$ are called irrational numbers.
Q.2] Give some examples of irrational numbers	Ans] $\sqrt{2}, \sqrt{3}, \sqrt{5}, \sqrt{6}, 0.10110\ldots$ π are some examples of irrational numbers.
Q.3] Are the square roots of all positive integers irrational ?	Ans] No, the square roots of all positive integers are not irrational. for ex. $\sqrt{4} = 2$ - rational
Q.4] Find an irrational number between $\frac{1}{7}$ and $\frac{2}{7}$	Ans] $\frac{1}{7} = 0.\overline{142857}$ $\frac{2}{7} = 0.\overline{285714}$ So, an irrational number between $\frac{1}{7}$ and $\frac{2}{7}$ is $0.150115001\ldots$

पाठाच्या पायऱ्या (Steps of Lesson)	अध्यापन मुद्दे (Teaching Points)	उद्दिष्टे व स्पष्टीकरणे (Objectives with Specification)
RECAPITULATION	1] Rational numbers - i] Definition ii] Examples iii] Decimal Expansion 2] Irrational numbers - i] Definition ii] Examples iii] Decimal expansion	*] To revise the topic taught by the teacher *] To evaluate the understanding of students *] To test the knowledge regarding the number system and examples

अध्ययनानुभव (Learning Experience)

शिक्षक कृती (Teacher Activity)	विद्यार्थी कृती (Student Activity)
Teachers ask some questions related to the topic	students give appropriate answers to the asked questions.
1] What are real numbers.	Ans] The collection of all rational and irrational numbers is called real numbers.
2] Classify the following as rational or irrational numbers. i] $\sqrt{9}$ ii] $\sqrt{2}$ iii] π iv] $\sqrt{225}$	Ans] i] $\sqrt{9} = 3$ .. rational ii] $\sqrt{2} = 1.414...$ irrational iii] $\pi = 3.1415...$ irrational iv] $\sqrt{225} = 15$ .. rational.
3] How can you classify rational and irrational numbers using their decimal expansions?	Ans] If the decimal expansion of a number is terminating or non-terminating recurring, then it is a rational number. If the decimal expansion of a number is non-terminating, non-recurring then it is an irrational number.

पाठाच्या पायऱ्या Steps of the Lesson	अध्यापन मुद्दे Teaching Points	उद्दिष्टे व विशिष्टके Objectives with Specification
HOMEWORK		*] To utilize the free time *] To create interest in the topic taught *] To understand the taught concept properly

फलक सार
Black Board Summary

Day-Saturday Class-IX On Roll-
Date-16/09/23 Sub-Mathematics Present-
Topic-Rational and Irrational Absent-
Numbers

1] Rational Numbers
$Q = \{ \frac{p}{q}$, where p and q are integers $q \neq 0 \}$

2] Irrational Numbers
I = { non-rational numbers }

3] Real numbers
R = { rational, irrational }

Homework - classify the following numbers as rational or irrational numbers
1] $\sqrt{23}$ 2] $\sqrt{625}$ 3] 0.3796 4] 7.478478 -----

अध्ययनानुभव (Learning Experience)

शिक्षक कृती (Teacher Activity)	विद्यार्थी कृती (Student Activity)
Teacher gives homework written on the black-board. Homework- Classify the following numbers as rational & irrational numbers. i] $\sqrt{23}$ ii] $\sqrt{625}$ iii] 0.3796 iv] 7.478478... v] 2.202002000... vi] $\sqrt{3}$	students write it down and solve by themselves in their respective notebooks.

अभिप्राय (Remarks)

पर्यवेक्षकाची सही
(Sign. of Supervisor)

पाठांक S.No 2 | विषय Subject Mathematics

शाळा School V.L Convent | विषयांश Topic Operations on Rational

पाठ साहित्य Material Aids Chalk, Blackboard, Duster | पूर्व ज्ञान Previous Knowledge Rational, Irrational

पाठाच्या पायऱ्या Steps of the Lesson	अध्यापन मुद्दे Teaching Points	उद्दिष्टे व विशिष्टके Objectives with Specification
INTRODUCTION	1] Rationalisation of denominator. 2] Laws of exponents for real numbers	*] To enable students to perform various operation on real numbers *] To enable students to apply laws of indices on real numbers *] To understand operations to be performed and apply it to solve various example
Statement of Aim - Today, we		are going to

दिनांक Date 18/09/23

वर्ग Class IX th

तासिका अवधी Length of the Period 35 min

अध्यायनानुभव Learning Experience

अध्यापक कृती Teacher's Activities	छात्र कृती Student's Activities
Teachers ask some of the introductory questions. Q1] What is $(\sqrt{6})+(-\sqrt{6})$? Q2] What is $(\sqrt{3})\cdot(\sqrt{3})$? Q3] What is $\frac{\sqrt{17}}{\sqrt{17}}$?	Students give satisfactory answers to the asked questions. Ans] The answer of $(\sqrt{6})+(-\sqrt{6})$ is zero $\sqrt{6}+(-\sqrt{6})=0$ Ans] The answer of $(\sqrt{3})\cdot(\sqrt{3})$ is 3 $(\sqrt{3})\cdot(\sqrt{3})=3$ Ans] The answer of $\frac{\sqrt{17}}{\sqrt{17}}$ is 1 $\frac{\sqrt{17}}{\sqrt{17}}=1$

Learn operations on real numbers.

पाठाच्या पायऱ्या (Steps of Lesson)	अध्यापन मुद्दे (Teaching Points)	उद्दिष्टे व स्पष्टीकरणे (Objectives with Specification)
PRESENTATION	Operations on Real Numbers- 1] The sum or difference of a rational number and an irrational number is irrational. ex- $2\sqrt{2}+\sqrt{2}=3\sqrt{2}$ 2] The product or quotient of a non-zero rational number with an irrational number is irrational. ex- $6\sqrt{3}\times 2 = 12\times\sqrt{3}$ $= 12\sqrt{3}$ 3] If we add, subtract multiply or divide two irrationals, the result may be rational or irrational ex- $\frac{8\sqrt{15}}{2\sqrt{3}} = 4\sqrt{5}$ $\frac{3\sqrt{3}}{2\sqrt{3}} = \frac{3}{2}$	1] Knowledge- students are able to know the concept of rationalisation of numbers 2] Understanding students are able to understand why and how real numbers are rationalised. 3] Application- students are able to apply the concept of rationalisation in examples and solve them.

अध्ययनानुभव (Learning Experience)

शिक्षक कृती (Teacher Activity)	विद्यार्थी कृती (Student Activity)
Teacher ask some questions related to the topic	Students give appropriate answers to the asked questions.
1] Rationalise the denominator of $\frac{1}{\sqrt{2}}$	Ans] $\frac{1}{\sqrt{2}} \times \frac{\sqrt{2}}{\sqrt{2}} = \frac{\sqrt{2}}{2}$
2] Rationalise the denominator of $\frac{1}{2+\sqrt{3}}$	Ans] $\frac{1}{2+\sqrt{3}} \times \frac{2-\sqrt{3}}{2-\sqrt{3}} = \frac{2-\sqrt{3}}{(2)^2-(\sqrt{3})^2}$ $= \frac{2-\sqrt{3}}{1}$ $= 2-\sqrt{3}$
3] what is i] $\sqrt{a} \times \sqrt{b}$ - ii] $(\sqrt{a}+b)(\sqrt{a}-b)$	Ans] The answers of i] $\sqrt{a} \times \sqrt{b}$ is $\sqrt{ab}$ ii] $(\sqrt{a}+b)(\sqrt{a}-b)$ is $(\sqrt{a})^2 - b^2 = a - b^2$
4] What is rationalising the denominator?	Ans] when the the denominato contains a term with squar root, the process of converting it to an expr- ession whose denominator is a rational number is called Rationalising the denominator.

पाठाच्या पायऱ्या (Steps of Lesson)	अध्यापन मुद्दे (Teaching Points)	उद्दिष्टे व स्पष्टीकरणे (Objectives with Specification)
	Laws of Exponents Let $a>0$ be a real number and p and q be the rational numbers. then, i] $a^p \cdot a^q = a^{p+q}$ ii] $(a^p)^q = a^{pq}$ iii] $\frac{a^p}{a^q} = a^{p-q}$ iv] $a^p b^p = (ab)^p$	1] Knowledge - students are able to know the concept of laws of indices with respect to real numbers. 2] Understanding - students are able to understand various laws of indices 3] Application - students are able to apply the concept of laws of indices to solve examples

अध्ययनानुभव (Learning Experience)	
शिक्षक कृती (Teacher Activity)	विद्यार्थी कृती (Student Activity)
Teachers ask some questions related to the topic.	Students give appropriate answers to the asked questions.
Q1] In the law $a^m \cdot a^n = a^{m+n}$ what are a, m, n called?	Ans] In the given law a is called the base and m and n are called exponents.
Q2] What is i] $a^0 = ?$ ii] $\frac{1}{a^n} = ?$	Ans] The answer of i] $a^0 = 1$ ii] $\frac{1}{a^n} = a^{-n}$
Q3] What is i] $\sqrt[n]{a} = ?$ ii] $2^{1/3} = ?$	Ans] The answer of i] $\sqrt[n]{a} = a^{\frac{1}{n}}$ ii] $2^{1/3} = \sqrt[3]{2}$
Q4] Explain how you do see at $a^{\frac{m}{n}}$ in the view of Laws of exponents.	Ans] Let $a > 0$ be a real number Let m and n are integers such that they don't have common factors. then. $a^{\frac{m}{n}} = (\sqrt[n]{a})^m = \sqrt[n]{a^m}$

पाठाच्या पायऱ्या (Steps of Lesson)	अध्यापन मुद्दे (Teaching Points)	उद्दिष्टे व स्पष्टीकरणे (Objectives with Specification)
RECAPITULATION	1] Operations on real numbers. 2] Rationalisation of the denominator 3] Laws of exponents.	*] To revise the topic taught by the teacher *] To evaluate the topic understood by the students *] To test the knowledge gained by students regarding operations on real numbers.

अध्ययनानुभव (Learning Experience)	
शिक्षक कृती (Teacher Activity)	विद्यार्थी कृती (Student Activity)
Teachers ask some questions related to the topic.	Students give appropriate answers to the asked questions
1) What should we do to rationalise the denominator of $\frac{1}{\sqrt{a}+b}$?	Ans] To rationalise the given number, we should multiply it by $\frac{\sqrt{a}-b}{\sqrt{a}-b}$ where a, b are integers.
2) If r is rational and s is irrational, what are its addition, subtraction, multiplication and division?	Ans] If r is rational and s is irrational, then r+s and r-s are irrational and rs and $\frac{r}{s}$ are irrational where $r \neq 0$
3) Simplify - $2^{\frac{2}{3}} \cdot 2^{\frac{1}{3}}$	Ans] By using the laws of indices $a^p \cdot a^q = a^{p+q}$ $2^{\frac{2}{3}} \cdot 2^{\frac{1}{3}} = 2^{\frac{2}{3}+\frac{1}{3}}$ $= 2^1 = 2$ The answer is 2.
4) Simplify - $(3^{\frac{1}{5}})^4$	Ans] By using the laws of indices $(a^p)^q = a^{pq}$ $(3^{1/5})^4 = 3^{1/5 \times 4}$ $= 3^{4/5}$ The answer is $3^{4/5}$

पाठाच्या पायऱ्या Steps of the Lesson	अध्यापन मुद्दे Teaching Points	उद्दिष्टें व विशिष्टके Objectives with Specification
HOMEWORK		*] To utilize the free time *] To create interest in the topic taught *] To understand the taught concept properly.

फलक सार

Black Board Summary

Day- Monday
Date - 18/09/23

Class- IX
Sub- Mathematics
Topic - operations on real numbers

On Roll-
Present-
Absent-

1] Rationalisation of denominator

$\sqrt{ab} = \sqrt{a} \times \sqrt{b}$

$(\sqrt{a}+\sqrt{b})(\sqrt{a}-\sqrt{b}) = a-b$

2] Laws of Indices

a] $a^p . a^q = a^{p+q}$

b] $a^p / a^q = a^{p-q}$

c] $(a^p)^q = a^{pq}$

d] $a^p . b^p = (ab)^p$

Homework - simplify -

1] $(3+\sqrt{3})(3-\sqrt{3})$

2] $(3+\sqrt{3})(2+\sqrt{2})$

3] $32^{2/5}$

4] $7^{1/2} . 8^{1/2}$

अध्ययनानुभव (Learning Experience)

शिक्षक कृती (Teacher Activity)	विद्यार्थी कृती (Student Activity)
Teacher gives homework written on blackboard Homework - Q] simplify 1] $(3+\sqrt{3})(3-\sqrt{3})$ 2] $(3+\sqrt{3})(2+\sqrt{2})$ 3] $32^{\frac{2}{5}}$ 4] $?^{\frac{1}{2}} \cdot 8^{\frac{1}{2}}$	Students write it down and solve by themselves in their respective notebooks.

अभिप्राय (Remarks)

Very good.

Kalbonds

पर्यवेक्षकाची सही
(Sign. of Supervisor)

पाठांक S.No. 3

विषय Subject Mathematics

शाळा School V.L. Convent

विषयांश Topic Heron's Formula

पाठ साहित्य Material Aids Chalk, Blackboard, Duster

पूर्व ज्ञान Previous Knowledge Types of Triangles

पाठाच्या पायऱ्या Steps of the Lesson	अध्यापन मुद्दे Teaching Points	उद्दिष्टे व विशिष्टके Objectives with Specification
INTRODUCTION	1] Perimeter 2] Semiperimeter 3] Heron's formula 4] Applications	*] To enable students to find area of scalene triangle *] To enable students to apply Heron's formula to find area of triangles. *] To enable students to apply Heron's formula in real life examples.
Statement of Aim - Today, we		are going to

दिनांक Date 23/09/23

and its Applications

वर्ग Class IX th

- Equilateral, Isosceles, Scalene triangle

तासिका अवधी Length of the Period 35 min

अध्यायनानुभव Learning Experience

अध्यापक कृती Teacher's Activities	छात्र कृती Student's Activities
Teacher asks some introductory questions	Students give appropriate answers of the asked questions
Q1] What are types of triangles with respect to sides?	Ans] The types of triangles based on sides are i] Equilateral triangle ii] Isosceles triangle iii] Scalene triangle
Q2] What are types of triangles with respect to angles	Ans] The types of triangles based on angles are i] Acute angled triangle ii] Obtuse angled triangle iii] Right angled triangle
Q3] What is the formula to calculate area of triangle?	Ans] The area of triangle can be calculated by $A = \frac{1}{2} \times base \times height$
Learn about Heron's Formula	

पाठाच्या पायऱ्या (Steps of Lesson)	अध्यापन मुद्दे (Teaching Points)	उद्दिष्टे व स्पष्टीकरणे (Objectives with Specification)
PRESENTATION	Perimeter of a triangle A triangle with three sides a, b, and c has its perimeter $P = a+b+c$ Semiperimeter of a triangle semiperimeter $S = \frac{a+b+c}{2}$	1] Knowledge - students are able to know the concept of perimeter and semiperimeter. 2] Understanding students are able to understand the use of perimeter and semi-perimeter 3] Application - students are able to apply learned concepts in real life situations.

अध्ययनानुभव (Learning Experience)	
शिक्षक कृती (Teacher Activity)	**विद्यार्थी कृती (Student Activity)**
Teacher ask some questions related to the topic.	students give appropriate answers to the asked questions.
Q.1] What is perimeter of a triangle?	Ans] The sum of lengths of all three sides of a triangle is perimeter $P = a+b+c$
Q.2] What is the unit of perimeter and semiperimeter of a triangle ?	Ans] The unit of perimeter and semiperimeter is same as that of length i.e. m, cm or unit
Q.3] Find the perimeter of a triangle whose sides are 3cm, 4cm and 5cm	Ans] Perimeter of triangle $P = a+b+c$ $= 3+4+5$ $= 12\text{ cm}$ $\therefore$ Perimeter $= 12\text{ cm}$
Q.4] Find the semiperimeter of the triangle in the above question.	Ans] Semiperimeter of a triangle $s = \frac{a+b+c}{2}$ $s = \frac{3+4+5}{2} = \frac{12}{2} = 6\text{cm}$ $\therefore$ Semiperimeter $= 6\text{cm}$

पाठाच्या पायऱ्या (Steps of Lesson)	अध्यापन मुद्दे (Teaching Points)	उद्दिष्टे व स्पष्टीकरणे (Objectives with Specification)
	Heron's Formula Area of a triangle $A = \sqrt{s(s-a)(s-b)(s-c)}$ Where, A is area of triangle s is semiperimeter a, b, c are sides of a triangle **Applications -** 1] To find the area of different types of a triangle 2] To find the area of a quadrilateral.	1] **Knowledge** - Students are able to know the concept of Heron's formula 2] **Understanding** Students are able to understand how Heron's formula is used to find area of triangles. 3] **Application** - Students are able to apply learned concepts to real life examples and scenarios.

अध्ययनानुभव (Learning Experience)	
शिक्षक कृती (Teacher Activity)	विद्यार्थी कृती (Student Activity)
Teachers ask some questions related to the topic	Students give appropriate answers to the asked questions
Q1] What is a Scalene triangle ?	Ans] A triangle whose all three sides are of unequal length is called a Scalene triangl
Q2] Who gave Heron's Formula ?	Ans] Hero of Alexandria derived formula for the calculation of the area of a triangle using lengths of all three sides.
Q3] What is the unit of area of a triangle?	Ans] The unit of area of a triangle is cm^2 or sq. cm m^2 or sq. m $unit^2$ or sq. units.
Q4] Find area of a triangle whose sides are 10m, 17 m and 21m?	Ans] $S = \frac{a+b+c}{2} = \frac{10+17+21}{2} = 24$ m $A = \sqrt{s(s-a)(s-b)(s-c)}$ $= \sqrt{24(24-10)(24-17)(24-21)}$ $= \sqrt{24 \times 14 \times 7 \times 3} = \sqrt{7056}$ $= 84$ sq. m $\therefore$ Area $= 84$ sq. m / m^2

पाठाच्या पायऱ्या (Steps of Lesson)	अध्यापन मुद्दे (Teaching Points)	उद्दिष्टे व स्पष्टीकरणे (Objectives with Specification)
RECAPITULATION	1] Perimeter $P = a+b+c$ 2] Semiperimeter $s = \frac{a+b+c}{2}$ 3] Heron's Formula $A = \sqrt{s(s-a)(s-b)(s-c)}$ 4] Applications of Heron's formula	*] To revise the topic taught by the teacher *] To evaluate the topic understood by the students. *] To test the knowledge gained by the students regarding Heron's formula

अध्ययनानुभव (Learning Experience)	
शिक्षक कृती (Teacher Activity)	**विद्यार्थी कृती (Student Activity)**
Teacher ask some questions related to the topic.	students give appropriate answers to the asked questions.
Q.1] When do we use Heron's formula ?	Ans] Heron's formula is used to find the area of triangle when all its three side-lengths are known to us.
Q.2] What is Heron's formula for equilateral triangle ?	Ans] An equilateral triangle has all its three sides equal. so, Heron's formula to find its area is given by $A = \sqrt{s(s-a)^3}$
Q.3] A triangle has sides 4 cm, 13 cm and 15 cm. Find the area of the triangle.	Ans] $s = \frac{4+13+15}{2} = 16$ cm $A = \sqrt{s(s-a)(s-b)(s-c)}$ $= \sqrt{16(16-4)(16-13)(16-15)}$ $= \sqrt{16 \times 12 \times 3 \times 1} = \sqrt{576} = 24$ sq. cm
Q.4] How can we find the area of a quadrilateral using Heron's formula ?	Ans] We can divide the given quadrilateral into two triangles and find the area for both using Heron's formula. At last add the two areas.

पाठाच्या पायऱ्या Steps of the Lesson	अध्यापन मुद्दे Teaching Points	उद्दिष्टे व विशिष्टके Objectives with Specification
H O M E W O R K		*] To utilize the free time *] To create interest in the topic taught. *] To understand the taught concept properly

फलक सार
Black Board Summary

Day - Monday
Date - 18/09/23

Class - IX
Sub - Mathematics
Topic - Heron's Formula

on Roll -
Present -
Absent -

Perimeter - sum of all the sides of a figure is called Perimeter

$P = a+b+c$

$s = \frac{a+b+c}{2}$

$A = \sqrt{s(s-a)(s-b)(s-c)}$

Homework - Find the area of a triangle whose perimeter is 54 cm and two of its sides measure 12 cm and 25 cm.

अध्ययनानुभव (Learning Experience)	
शिक्षक कृती (Teacher Activity)	विद्यार्थी कृती (Student Activity)
Teacher gives homework written on blackboard. Homework - Q] Find the area of a triangle whose perimeter is 54 cm and two of its sides are 12 cm and 25 cm.	Students write it down and solve in their respective notebooks.

अभिप्राय (Remarks)

पर्यवेक्षकाची सही
(Sign. of Supervisor)

पाठांक S.No. 4 | विषय Subject Mathematics

शाळा School V.L-convent | विषयांश Topic Polynomials (Degree

पाठ साहित्य Material Aids Chalk, duster, Blackboard. | पूर्व ज्ञान Previous Knowledge Basic algebraic

पाठाच्या पायऱ्या Steps of the Lesson	अध्यापन मुद्दे Teaching Points	उद्दिष्टे व विशिष्टके Objectives with Specification
INTRODUCTION	1] Degree of Polynomials 2] Algebraic Identities	*] To enable students to recall algebraic identities *] To enable students to predict the degree of the polynomials. *] Students are able to define co-efficient, degree of polynomials
Statement of Aim - Today we		are going to

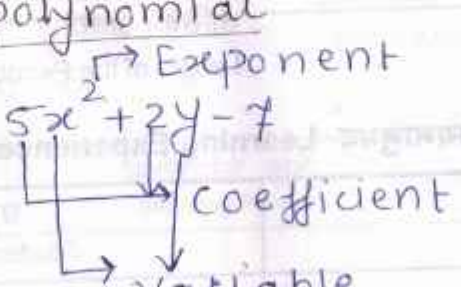
दिनांक Date 26/09/23

वर्ग Class IX th

तासिका अवधी Length of the Period 35 min

अध्यायनानुभव Learning Experience

अध्यापक कृती Teacher's Activities	छात्र कृती Student's Activities
Teacher asks some introductory questions Q1] What are polynomials?	Students give appropriate answers to the asked questions. Ans] An expression of more than two algebraic terms, contain sum and various powers of the variables is called a polynomial.
Q2] In the given polynomial, $5x^2 + 2y - 7$, what is the constant? Q3]	Ans] In the given polynomial, constant term is 7 Ans]
Study the topic Polynomials	

पाठाच्या पायऱ्या (Steps of Lesson)	अध्यापन मुद्दे (Teaching Points)	उद्दिष्टे व स्पष्टीकरणे (Objectives with Specification)
PRESENTATION	**Degree of a polynomial**  The highest power of the variable in a polynomial is called as degree of the polynomial In the given polynomial, highest power of variable is 2. So, degree of the polynomial is 2.	1] Knowledge - The students are able to know various algebraic identities 2] Understanding The students will be able to explain the term and coefficient of polynomials. 3] Application The students are able to predict the degree of the polynomials.

अध्ययनानुभव (Learning Experience)	
शिक्षक कृती (Teacher Activity)	विद्यार्थी कृती (Student Activity)
Teachers ask questions related to the topic	Students give appropriate answers to the asked questions.
Q.1] What are polynomials having one and two terms called?	Ans] Polynomials having one term are called monomials while two terms are called binomials.
Q.2] What is a polynomial having degree one and two called?	Ans] A polynomial of degree one is called linear polynomial while one having degree two is called quadratic Polynomial.
Q.3] What is the degree of a non-zero constant polynomial?	Ans] The degree of a non-zero constant polynomial is zero.
Q.4] What is a polynomial having degree three and four called?	Ans] A polynomial of degree three is called cubic polynomial whereas one having degree four is called as quartic polynomial.

पाठाच्या पायऱ्या (Steps of Lesson)	अध्यापन मुद्दे (Teaching Points)	उद्दिष्टे व स्पष्टीकरणे (Objectives with Specification)
	Algebraic Identities 1] $(x+y)^2 = x^2+2xy+y^2$ 2] $(x-y)^2 = x^2-2xy+y^2$ 3] $x^2-y^2 = (x+y)(x-y)$ 4] $(x+a)(x+b)$ $= x^2+(a+b)x+ab$ 5] $(x+y+z)^2$ $= x^2+y^2+z^2+2xy$ $+2yz+2zx$ 6] $(x+y)^3 = x^3+y^3+$ $3xy(x+y)$ 7] $(x-y)^3 = x^3-y^3$ $-3xy(x-y)$ 8] $x^3+y^3+z^3-3xyz$ $= (x+y+z)$ $(x^2+y^2+z^2-xy$ $-yz-zx)$	1] Knowledge- students are able to know various algebraic identities. 2] Understanding The students will be able to explain the terms coefficients and degree of polynomials. 3] Application- The students are able to predict the degree of the polynomials

अध्ययनानुभव (Learning Experience)	
शिक्षक कृती (Teacher Activity)	विद्यार्थी कृती (Student Activity)
Teachers ask some questions related to the topic	students give appropriate answers to the asked questions.
Q.1] Find the product of $(x-3)(x+5)$	Ans] $(x-3)(x+5)$ $= x^2 + [-3+5]x + (-3)(5)$ $= x^2 + 2x - 15$
Q.2] Evaluate 105×106 without multiplying directly	Ans] $105 \times 106 = (100+5)(100+6)$ $= (100)^2 + (5+6) \times 100 + (5 \times 6)$ $= 10000 + 1100 + 30$ $= 11130$
Q.3] Write $(3a+4b+5c)^2$ in expanded form.	Ans] Let $x = 3a$, $y = 4b$, $z = 5c$ $(3a+4b+5c)^2 = 9a^2 + 16b^2 + 25c^2 + 24ab + 40bc + 30ac$
Q.4] Evaluate $(104)^3$ without calculating numerically	Ans] $(104)^3 = (100+4)^3$ $(104)^3 = (100)^3 + (4)^3 + 3(100)(4)(100+4)$ $= 1000000 + 64 + 124800$ $= 1124864$

पाठाच्या पायऱ्या (Steps of Lesson)	अध्यापन मुद्दे (Teaching Points)	उद्दिष्टे व स्पष्टीकरणे (Objectives with Specification)
RECAPITULATION	1] Degree of a polynomial → a] linear b] quadratic c] cubic d] quartic 2] Algebraic Identities	*] To revise the topic taught by the teacher *] To evaluate the topic understood by the students *] To test the knowledge gained by the students regarding polynomials.

अध्ययनानुभव (Learning Experience)	
शिक्षक कृती (Teacher Activity)	विद्यार्थी कृती (Student Activity)
Teachers ask some questions related to the topic Q1] What is the coefficient of x^2 in the following - i] $2+x^2+x$ ii] $\pi/2\,x^2+x$ Q2] Write the degree of each of the following i] $5x^3+4x^2+7x$ ii] $4-y^2$ iii] $5t-\sqrt{7}$ Q3] Give one example each of a binomial of degree 35 and a monomial of degree 100. Q4] Write the following cube in the expanded form $(3a+4b)^3$	Students give appropriate answers to the asked questions. Ans] The coefficient of x^2 in i] $2+x^2+x$ is 1 ii] $\pi/2\,x^2+x$ is $\pi/2$ Ans] The degree of equations i] $5x^3+4x^2+7x$ is 3 ii] $4-y^2$ is 2 iii] $5t-\sqrt{7}$ is 1 Ans] A binomial of degree 35 is $3x^{35}+25$ Monomial of degree 100 is y^{100}, $3x^{100}$ Ans] $(3a+4b)^3$ $=(3a)^3+(4b)^3+3(3a)(4b)(3a+4b)$ $=27a^3+64b^3+108a^2b+144ab^2$

पाठाच्या पायऱ्या Steps of the Lesson	अध्यापन मुद्दे Teaching Points	उद्दिष्टे व विशिष्टके Objectives with Specification
HOMEWORK		*] To utilize the free time *] To create interest in the topic taught. *] To understand the taught concept properly

फलक सार

Black Board Summary

Day - Saturday
Date - 23/09/23

Class - IX
Sub - Mathematics
Topic - Polynomials

On Roll -
Present -
Absent -

Standard form of a polynomial

$ax^2 + by + c = 0$

Degree of a Polynomial

1] Linear
2] Quadratic
3] Cubic
4] Quartic

Homework - Q.1] Classify the following polynomials as linear, quadratic and quartic.

a] $x^2 + x$ b] $x^4 + 7x^3$ c] $x + 1$ 4] x^2

अध्ययनानुभव (Learning Experience)

शिक्षक कृती (Teacher Activity)	विद्यार्थी कृती (Student Activity)
Teacher gives homework written on blackboard. Homework - 1] Classify the following as linear, quadratic and cubic, quartic polynomials. 1] x^2+x 2] x^4+7x^3 3] $1+x$ 4] t^2 2] Expand 1] $(3x+4)(3x-5)$ 2] $(2a-3b)^3$	Students write it down and solve it in their respective notebooks

अभिप्राय (Remarks)

पर्यवेक्षकांची सही
(Sign. of Supervisor)

पाठांक S.No 5 | विषय Subject Mathematics

शाळा School V.L Convent | विषयांश Topic Zeros of a Polynomial

पाठ साहित्य Material Aids Chalk, duster, blackboard | पूर्व ज्ञान Previous Knowledge Polynomials and

पाठाच्या पायऱ्या Steps of the Lesson	अध्यापन मुद्दे Teaching Points	उद्दिष्टे व विशिष्टके Objectives with Specification
INTRODUCTION	1] Zero of a polynomial 2] Factor Theorem	*] To enable students to identify factors of a polynomial *] To enable students to predict the zeros of a polynomial *] students are able to define factor theorem
Statement of Aim – Today we are going to		

दिनांक Date 05/10/23

वर्ग Class IX th

तासिका अवधी Length of the Period 35 min

अध्यायनानुभव Learning Experience

अध्यापक कृती Teacher's Activities	छात्र कृती Student's Activities
Teachers ask some introductory questions Q1] What is the variable in the equation/ polynomial $5x^3-2x^2+3x-2$? Q2] Which value will you get when you replace x by 1 in the equation? Q3] What can we say from above value?	Students give appropriate answers to the asked questions. Ans] In the polynomial $5x^3-2x^2+3x-2$, x is the variable. Its value varies from a lower range to higher. Ans] $p(x)=5x^3-2x^2+3x-2$ $p(1)=5(1)^3-2(1)^2+3(1)-2$ $=5-2+3-2$ $p(1)=4$ Ans] We can say that the value of $p(x)$ at $x=1$ is 4.

Study Zeros of a Polynomial.

पाठाच्या पायऱ्या (Steps of Lesson)	अध्यापन मुद्दे (Teaching Points)	उद्दिष्टे व स्पष्टीकरणे (Objectives with Specification)
PRESENTATION	**Zeros of a Polynomial** A zero of a polynomial $p(x)$ is a number c such that $p(c) = 0$ Ex- Finding a zero of $p(x)$ is same as solving the equation $p(x) = 0$ if $p(x) = 2x + 1$ $2x + 1 = 0$ $2x = -1$ $\boxed{x = -\frac{1}{2}}$ $\therefore -\frac{1}{2}$ is the zero of the polynomial $p(x) = 2x + 1$	1] Knowledge - The students are able to know zeros of a polynomial 2] Understanding students are able to understand how zeros of polynomial are calculated 3] Application students are able to calculate zeros of polyno and apply it to solve examples

अध्ययनानुभव (Learning Experience)	
शिक्षक कृती (Teacher Activity)	विद्यार्थी कृती (Student Activity)
Teachers ask questions related to the topic	Students give appropriate answers to the asked questions.
Q1] How many zeros does a linear polynomial has?	Ans] Every linear polynomial has one and only one zero.
Q2] Can a polynomial have more than one zero?	Ans] Yes, a polynomial can have more than one zero.
Q3] Verify whether -2 is the zero of the polynomial $x+2$	Ans] Let $p(x) = x+2$ $0 = x+2$ $x = -2$ $\therefore$ Yes, -2 is a zero of the polynomial $x+2$
Q4] Check whether 2 and 0 are zeros of the polynomial $x^2 - 2x$.	Ans] Let $p(x) = x^2 - 2x$ $p(2) = (2)^2 - 2(2)$ $= 4 - 4$ $= 0$ $p(0) = (0)^2 - 2(0)$ $= 0 - 0$ $= 0$ Yes, 2 and 0 are both zeros of the polynomial $x^2 - 2x$

पाठाच्या पायऱ्या (Steps of Lesson)	अध्यापन मुद्दे (Teaching Points)	उद्दिष्टे व स्पष्टीकरणे (Objectives with Specification)
	Factor Theorem:- If $p(x)$ is a polynomial of degree $n \geq 1$ and a is any real number, then i] $x-a$ is a factor of $p(x)$ if $p(a)=0$ ii] $p(a)=0$ if $x-a$ is a factor of $p(x)$ **Ex** - Examine whether $x+2$ is a factor of $2x+4$. The zero of $2x+4$ is $p(x) = 2x+4$ $0 = 2x+4$ $2x = -4$ $x = -2$ $p(-2) = 2(-2)+4$ $= -4+4$ $= 0$ $\therefore (x+2)$ is a factor of $2x+4$	1] **Knowledge**- Students are able to know factor theorem of polynomials. 2] **Understanding**- Students are able to understand how factors of a polynomial are predicted 3] **Application**- Students are able to apply factor theorem to solve examples.

अध्ययनानुभव (Learning Experience)	
शिक्षक कृती (Teacher Activity)	विद्यार्थी कृती (Student Activity)
Teachers ask questions related to the topic	students give appropriate answers to asked questions
6] Factorise y^2-5y+6 by factor theorem.	Ans] $p(y)=(y-a)(y-b)$ $p(2)=2^2-(5\times2)+6=0$ $\therefore y-2$ is a factor of $p(y)$ $p(3)=3^2-(5\times3)+6=0$ $\therefore y-3$ is a factor of $p(y)$ $\therefore (y-2)(y-3)$ are factors
6] Factorise y^2-5y+6 by splitting the middle term	Ans] y^2-5y+6 $=y^2-3y-2y+6$ $=y(y-3)-2(y-3)$ $=(y-2)(y-3)$ $6y^2$ $-3y, -2y$ $-5y$ $\therefore (y-2)(y-3)$ are the factors.
3] If $p(a)=0$ by $p(x)$ then what can you say about its factor?	Ans] If $p(a)=0$ then $(x-a)$ is a factor of given $(p(x))$.
4] Find the value of 'k' if $x-1$ is a factor of $4x^3+3x^2-4x+k$.	Ans] $x-1$ is a factor of $p(x)$ $\therefore p(1)=0$ $p(1)=4(1)^3+3(1)^2-4(1)+k$ $0=4+3-4+k$ $\boxed{k=-3}$ $\therefore$ value of k is -3.

पाठाच्या पायऱ्या (Steps of Lesson)	अध्यापन मुद्दे (Teaching Points)	उद्दिष्टे व स्पष्टीकरणे (Objectives with Specification)
RECAPITULATION	1] Zeros of a polynomial 2] Factor Theorem if $x-a$ is a factor of $p(x)$ then $p(a) = 0$ 3] Splitting the middle term	*] To revise the topic taught by the teacher *] To evaluate the topic understood by the students. *] To test the knowledge gained by the students regarding polynomials

अध्ययनानुभव (Learning Experience)	
शिक्षक कृती (Teacher Activity)	विद्यार्थी कृती (Student Activity)
Teachers ask questions related to the topic	students give appropriate answers to the asked questions.
Q1] Find the value of the polynomial $5x-4x^2-3$ at $x=0$	Ans] let $p(x) = 5x-4x^2-3$ $p(0) = 5(0)-4(0)^2-3$ $= -3$ $\therefore$ at $x=0$, value of polynomial is -3.
Q2] Find $p(1)$ of the polynomial $p(y) = y^2-y+1$	Ans] let $p(y) = y^2-y+1$ $p(1) = (1)^2-(1)+1$ $p(1) = 1$ $\therefore p(1)$ of $p(y)$ is 1.
Q3] Is it necessary that zero of a polynomial is zero?	Ans] No, a zero of a polynomial need not to be zero.
Q4] Determine whether $g(x) = x+1$ is a factor of $p(x) = 2x^3+x^2-2x-1$	Ans] $p(x) = 2x^3+x^2-2x-1$ $x+1=0 \quad x=-1$ $p(-1) = 2(-1)^3+(-1)^2-2(-1)-1$ $= -2+1+2-1$ $= 0$ $\therefore g(x)$ is a factor of $p(x)$

पाठाच्या पायऱ्या Steps of the Lesson	अध्यापन मुद्दे Teaching Points	उद्दिष्टे व विशिष्टके Objectives with Specification
HOMEWORK		*] To utilize the free time *] To create interest in the topic taught *] To understand the taught concept properly.

फलक सार

Black Board Summary

Day - Tuesday
Date - 26/09/23

Class - IX
Sub - Mathematics
Topic - Zero of a polynomial

On Roll -
Present -
Absent -

1] Zero of a polynomial $p(x)$ is $p(c) = 0$

2] Factor theorem
→ If $(x-a)$ is a factor of $p(x)$ then $p(a) = 0$

Homework - Q.1] Find the zero of $p(x)$ in each case.

1] $p(x) = 3x - 2$ 2] $p(x) = 2x + 5$

अध्ययनानुभव (Learning Experience)	
शिक्षक कृती (Teacher Activity)	विद्यार्थी कृती (Student Activity)
Teacher gives homework written on the blackboard Homework - 1] Find zero of the polynomial p(x) in each case i] $p(x) = 3x - 2$ ii] $p(x) = 2x + 5$ 2] Factorise i] $12x^2 + 7x + 1$ ii] $6x^2 + 5x - 6$	Students write it do and solve it in th notebooks.

अभिप्राय (Remarks)

पर्यवेक्षकाची सही
(Sign. of Supervisor)

पाठांक S.No 6 | विषय Subject Mathematics

शाळा School V.L. convent | विषयांश Topic Co-ordinate Geo

पाठ साहित्य Material Aids Chalk, Duster, Blackboard, Graph Paper | पूर्व ज्ञान Previous Knowledge Position of point

पाठाच्या पायऱ्या Steps of the Lesson	अध्यापन मुद्दे Teaching Points	उद्दिष्टे व विशिष्टके Objectives with Specification
INTRODUCTION	1] Cartesian system 2] Plotting the points in the cartesian plane	*] To enable students to know and understand co-ordinate geometry *] To enable students to determine x and y coordinates of the points. *] students are able to plot points in the cartesian plane
Statement of Aim - Today, we		are going to

दिनांक Date 09/10/23

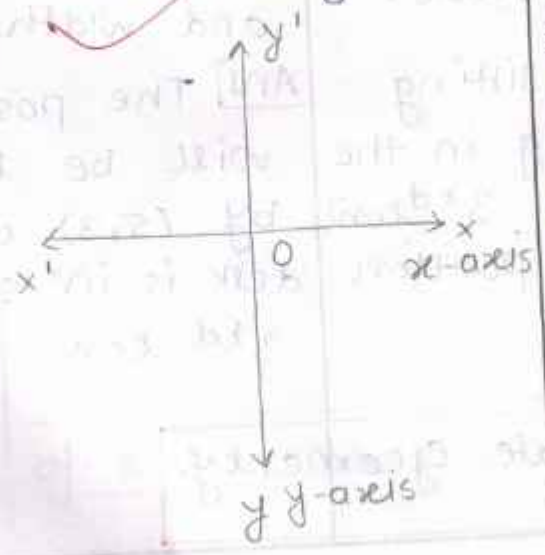
वर्ग Class IX th

तासिका अवधी Length of the Period 35 min

अध्यायनानुभव Learning Experience

अध्यापक कृती Teacher's Activities	छात्र कृती Student's Activities
Teachers ask some introductory questions	Students give appropriate answers to the asked questions
Q1] How many informations do you need to represent a dot?	Ans] We need two independant informations to represent the position of a dot
Q2] How will you describe the position of table lamp on your study table?	Ans] We will describe the position of table lamp with the help of length and width to the position.
Q3] If you are sitting on the desk lying in the 5th column and 3rd row, how will your position be represented?	Ans] The position of desk will be represented by (5,3) as the position of desk is in 5th column and 3rd row.

Learn co-ordinate geometry.

पाठाच्या पायऱ्या (Steps of Lesson)	अध्यापन मुद्दे (Teaching Points)	उद्दिष्टे व स्पष्टीकरणे (Objectives with Specification)
PRESENTATION	Cartesian system 1] x-axis x'x The horizontal line is called x-axis 2] y-axis y'y The vertical line is called y-axis 3] Origin O The point where x and y axis cross is called origin 4] Negative directions ox and oy 5] Positive directions ox' and oy'  	1] knowledge students are able to know about cartesian plane 2] Understanding students are able to understand positions of a point on the graph paper 3] Application students are able to apply the knowledge to plot points on the graph paper

	अध्ययनानुभव (Learning Experience)	
	शिक्षक कृती (Teacher Activity)	विद्यार्थी कृती (Student Activity)
	Teachers ask questions related to the topic	Students give apptopria answers to the asked questions
	Q1] The concept of co-ordinate geometry was mainly developed by which mathematician?	Ans] The concept of coordi geometry was developed French philosopher and mathematician Rene Descartes.
	Q2] What is the name of horizontal and vertical lines drawn to determine the position of any point on the cartesian plane?	Ans] In the cartesian plane, horizontal line called x-axis and vertical line is called y-axis.
	Q3] What is the name of each part of the plane formed by the two lines?	Ans] The name of the par of the plane formed by two lines is called quadrants. There are for quadrants in cartesian pl
	Q4] What is the name of the point of inter-section of x and y axis?	Ans] Both x and y interse at a point called orig co-ordinates of origin are O(0,0).

स्पष्टीकरणे
with Specification)

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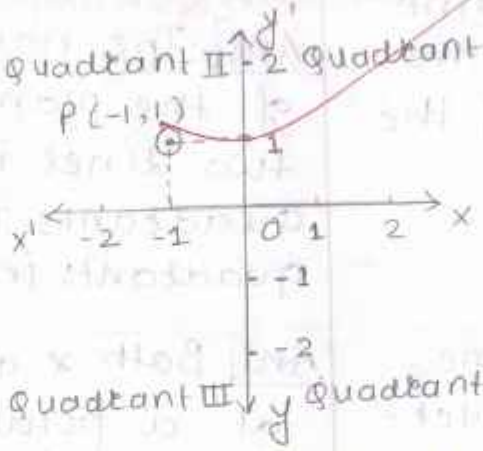
पाठाच्या पायऱ्या (Steps of Lesson)	अध्यापन मुद्दे (Teaching Points)	उद्दिष्टे व स्पष्टीकरणे (Objectives with Specification)
	Quadrants - x and y axes divide the cartesian plane into four parts, these parts are called quadrants **x - coordinate -** perpendicular distance measured along x-axis from y-axis. abscissa **y - coordinate -** perpendicular distance measured along y-axis from x-axis. ordinate.  The position of point P is represented by P(-1,1)	**1] Knowledge** students are able to know about cartesian plane and coordinates of points. **2] Understanding** students are able to understand position of a point on the graph paper. **3] Application** students are able to apply the knowledge of cartesian system to plot points on the graph paper.

अध्ययनानुभव (Learning Experience)	
शिक्षक कृती (Teacher Activity)	विद्यार्थी कृती (Student Activity)
Teachers ask questions related to the topic	students give appropriate answers to the asked questions.
Q.1] To locate the position of an object in a plane, what do we need?	Ans] To determine position of an object in a plane, we require two perpendicular lines, one horizontal and one vertical.
Q.2] What are the plane and intersecting lines called?	Ans] The plane is called as cartesian plane and the lines are called co-ordinate axes. x-axis and y-axis
Q.3] Define x-coordinate.	Ans] The distance of a point from the y-axis is called x-coordinate or abscissa.
Q.4] Define y-coordinate	Ans] The distance of the point from the x-axis is called y-coordinate or ordinate

पाठाच्या पायऱ्या (Steps of Lesson)	अध्यापन मुद्दे (Teaching Points)	उद्दिष्टे व स्पष्टीकरणे (Objectives with Specification)
RECAPITULATION	1] cartesian system → a] x-axis b] y-axis c] origin d] Negative direction e] Positive direction 2] Quadrants → a] Quadrant I (+,+) b] Quadrant II (−,+) c] Quadrant III (−,−) d] Quadrant IV (+,−) 3] x-coordinate abscissa 4] y-coordinate ordinate	*] To revise the topic taught by the teacher. *] To evaluate the topic understood by the students. *] To test the knowledge gained by students regarding co-ordinate geometry

अध्ययनानुभव (Learning Experience)	
शिक्षक कृती (Teacher Activity)	विद्यार्थी कृती (Student Activity)
Teachers ask questions related to the topic	students give appropriate answers to the asked questions.
Q.1] If the abscissa of a point is x and the ordinate is y, then what are the co-ordinates of the point?	Ans] If the abscissa of a point is x and the ordinate is y, then the co-ordinates of point are (x, y)
Q.2] What are the co-ordinates of a point lying on x-axis?	Ans] The co-ordinates of a point lying on x-axis is $(x, 0)$
Q.3] What are the co-ordinates of a point lying on y-axis?	Ans] The co-ordinates of a point lying on y-axis is $(0, y)$
Q.4] What are signs of the four quadrant co-ordiriates?	Ans] The signs of four quadrants are $(+,+)$, $(-,+)$, $(-,-)$, $(+,-)$ respectively.

पाठाच्या पायऱ्या Steps of the Lesson	अध्यापन मुद्दे Teaching Points	उद्दिष्टे व विशिष्टके Objectives with Specification
HOMEWORK		*] To utilize the free time. *] To create the interest in the topic taught *] To understand the taught concept properly

फलक सार

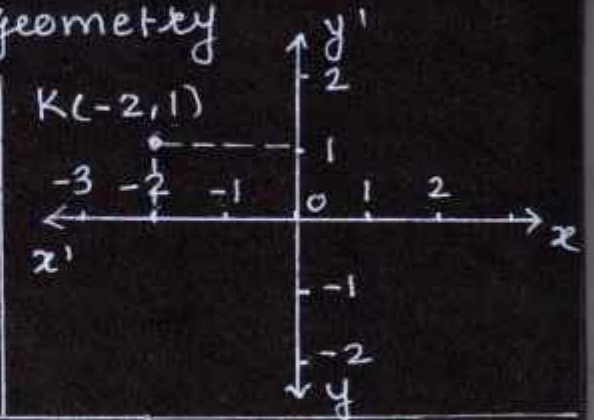
Black Board Summary

Day - Thursday
Date - 05/10/23

Class - IX
Sub - Mathematics
Topic - Co-ordinate geometry

On Roll - Present - Absent

Cartesian system
The co-ordinates of point K are (-2, 1)
x-co-ordinate = -2
y-co-ordinate = 1



Homework - Plot the following points on the graph paper - 1] M(-3,4) 2] L(-5,-4)

अध्ययनानुभव (Learning Experience)

शिक्षक कृती (Teacher Activity)	विद्यार्थी कृती (Student Activity)
Teacher gives homework written on the blackboard. Homework - 1. Plot the following points on the graph paper. M(-3, 4) L(-5, -4) S(3, -4)	Students write it down and solve it in their respective notebooks.

अभिप्राय (Remarks)

INTRODUCTION

पर्यवेक्षकाची सही
(Sign. of Supervisor)

पाठांक S.No 7

विषय Subject Mathematics

शाळा School V. L. Convent

विषयांश Topic Euclid's geomet

पाठ साहित्य Material Aids chalk, duster, blackboard

पूर्व ज्ञान Previous Knowledge Lines, angles, pair

पाठाच्या पायऱ्या Steps of the Lesson	अध्यापन मुद्दे Teaching Points	उद्दिष्टे व विशिष्टके Objectives with Specification
INTRODUCTION	1] Euclid's Axioms 2] Euclid's Postulates	*] To enable students to understand the term geometry. *] students are enable to know about Euclid and his work *] To enable students to about axioms and postulates of Euclid's geometry.
Statement of Aim - Today, we		are going to

दिनांक Date 11/10/23

वर्ग Class IX th

तासिका अवधी Length of the Period 35 min

अध्यायनानुभव Learning Experience

अध्यापक कृती Teacher's Activities	छात्र कृती Student's Activities
Teachers ask some introductory questions Q.1] What is the meaning of the word 'geometry'?	students give appropriate answers to the asked questions. Ans] The word geometry comes from greek word 'geo' meaning 'earth' and 'metrein' meaning 'to measure'
Q.2] What is a point?	Ans] A point is that which has no part. A mark of location is a point.
Q.3] What is a line?	Ans] A line is a breadthless length.
study Euclid's geometry.	

पाठाच्या पायऱ्या (Steps of Lesson)	अध्यापन मुद्दे (Teaching Points)	उद्दिष्टे व स्पष्टीकरणे (Objectives with Specification)
PRESENTATION	Euclid's Axioms 1] Things which are equal to the same thing are equal to one another. 2] If equals are added to equals, the wholes are equals. 3] If equals are subtracted from equals, the remainders are equal. 4] Things which coincide with one another are equal ~~to one~~ another 5] The whole is always greater than the part	1] knowledge - students are able to know Euclid's Axioms and their importance 2] Understanding students are able to understand Euclid's Axioms 3] Application - students are able to apply Euclid's Axioms to solve various examples

अध्ययनानुभव (Learning Experience)	
शिक्षक कृती (Teacher Activity)	विद्यार्थी कृती (Student Activity)
Teachers ask some questions related to the topic	Students give appropriate answers to the asked questions
2] What are Axioms?	Ans] Common notations in Mathematics which are specifically used throughout the whole Mathematics are called Axioms.
3] What is a plane/ what is a surface?	Ans] A surface is that which has length and breadth only.
4] What are ends of a line segment?	Ans] Ends of a line segment are points.
5] How many diamensions does the following have? 1] Solid 2] surface	Ans] A solid has three diamensions while a surface has two diamensions.

पाठाच्या पायऱ्या (Steps of Lesson)	अध्यापन मुद्दे (Teaching Points)	उद्दिष्टे व स्पष्टीकरणे (Objectives with Specification)
	Euclid's Postulates - 1] A straight line may be drawn from any one point to any other point. 2] A terminated line can be produced indefinately 3] A circle can be drawn with any centre and any radius. 4] All right angles are equal to one another 5] Two distinct intersecting lines cannot be parallel to the same line.	1] Knowledge - Students are able to know Euclid's Postulates and their importance 2] Understanding Students are able to understand Euclid's Postulates. 3] Application - Students are able to apply Euclid's Postulates to solve various examples.

ष्टीकरणे Specification)	अध्ययनानुभव (Learning Experience)	
	शिक्षक कृती (Teacher Activity)	विद्यार्थी कृती (Student Activity)
dge- are know es and ance	Teacher asks some questions related to the topic	Students give appropriate answers to the asked questions.
	2] What are postulates?	Ans] Common notations in mathematics which are specifically used in geometry are called postulates.
tanding are nd el.	3] What are parallel lines?	Ans] Lines which never intersect each other and are always at a constant distance from each other are called parallel lines.
on- are apply s to ions	4] What are perpendicular lines?	Ans] Lines which intersect each other at right angles are called perpendicular lines.
	5] What is radius of a circle?	Ans] A line from any point on the circumference of the circle to the centre of circle is called radius of a circle.

पाठाच्या पायऱ्या (Steps of Lesson)	अध्यापन मुद्दे (Teaching Points)	उद्दिष्टे व स्पष्टीकरणे (Objectives with Specification)
RECAPITULATION	1] Euclid's Axioms 2] Euclid's Postulates	*] To revise the topic taught by the teacher. *] To evaluate the topic understood by the students *] To test the knowledge gained by students regarding Euclid's geometry

अध्ययनानुभव (Learning Experience)	
शिक्षक कृती (Teacher Activity)	विद्यार्थी कृती (Student Activity)
Teacher asks some questions related to the topic	Students give appropriate answers to the asked questions.
Q.1] What are universal truths in mathematics?	Ans] Euclid assumed certain properties which were not to be proved. These assumptions are called universal truths.
Q.2] What is Euclid's geometry?	Ans] Euclidean geometry is the study of plane and solid figures on the basis of axioms and theorems employed by Euclid.
Q.3] What is an infinity point?	Ans] An ideal mathematical point in projective geometry that preserves the magnitudes of all angles is an infinity point
Q.4] Who was Alexandrian?	Ans] Alexandrian was a greek mathematician and engineer who was active in his native city of Alexandria, Roman Egypt.

पाठाच्या पायऱ्या Steps of the Lesson	अध्यापन मुद्दे Teaching Points	उद्दिष्टे व विशिष्टके Objectives with Specification
HOMEWORK		*] To utilize the free time *] To revise the topic taught *] To create the interest in the topic taught

फलक सार

Black Board Summary

Day - Monday
Date - 09/10/23

Class - IX
Sub - Mathematics
Topic - Euclid's geometry

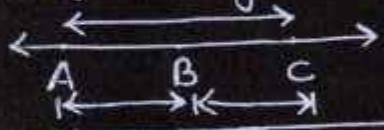
On Roll -
Present -
Absent -

Euclid's Axioms -

Things which are equal to the same thing are equal to one another.

Euclid's Postulates -

A terminated line can be produced indefinately



Homework - Q] If A, B, C are three points on a line, and B lies between A and C, prove that $AB + BC = AC$.

अध्ययनानुभव (Learning Experience)

शिक्षक कृती (Teacher Activity)	विद्यार्थी कृती (Student Activity)
The teacher gives homework written on the blackboard. Homework - A, B, C are three points on a line and B lies between A and C, prove that AB + BC = AC	Students write it down and solve it in their respective notebooks.

अभिप्राय (Remarks)

पर्यवेक्षकाची सही
(Sign. of Supervisor)

पाठांक S.No 8

विषय Subject Mathematics

शाळा School V.L. convent

विषयांश Topic Lines and Angles

पाठ साहित्य Material Aids Chalk, duster, blackboard

पूर्व ज्ञान Previous Knowledge Points, Parallel

पाठाच्या पायऱ्या Steps of the Lesson	अध्यापन मुद्दे Teaching Points	उद्दिष्टे व विशिष्टके Objectives with Specification
INTRODUCTION	1] Angles 2] Lineal pair of angles 3] Parallel lines and intersecting lines 4] Parallel lines and transversal	*] To enable students to know various types of lines and angles *] To enable students to know concept of parallel lines *] To enable students to know the concept of transversal

Statement of Aim - Today, we are going

दिनांक Date 13/10/23

वर्ग Class IX

Types of angles

तासिका अवधी Length of the Period 35 min

अध्यायनानुभव Learning Experience

अध्यापक कृती Teacher's Activities	छात्र कृती Student's Activities
Teacher asks some introductory questions 1] What is a line and what is a line segment? 2] What are collinear points? 3] What is an angle?	Students give appropriate answers to the asked questions. Ans] A breadthless length is called a line. If a line has two end points then it is called a line segment. Ans] If three or more points lie on a straight line are called collinear points. Ans] When two rays originate from same endpoint, angle is formed
To study about Lines and Angles.	

दिनांक Date 13/10/23

वर्ग Class IX

es, types of angles

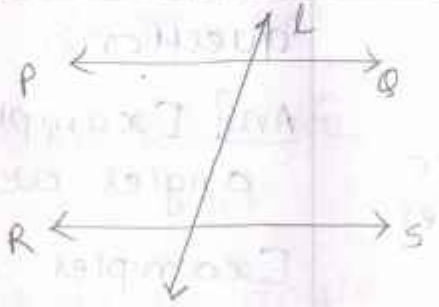
तासिका अवधी Length of the Period 35 min

अध्यायनानुभव Learning Experience

अध्यापक कृती Teacher's Activities	छात्र कृती Student's Activities
Teacher asks some introductory questions 1] What is a line and what is a line segment? 2] What are collinear points? 3] What is an angle?	students give appropriate answers to the asked questions. Ans] A breadthless length is called a line. If a line has two end points then it is called a line segment. Ans] If three or more points lie on a straight line are called collinear points. Ans] When two rays originate from same endpoint, angle is formed
study about Lines	and Angles.

पाठाच्या पायऱ्या (Steps of Lesson)	अध्यापन मुद्दे (Teaching Points)	उद्दिष्टे व स्पष्टीकरणे (Objectives with Specification)
PRESENTATION	**Types of Angles** 1] Acute angle $0° < x < 90°$ 2] Right angle $x = 90°$ 3] obtuse angle $90° < x < 180°$ 4] Straight angle $x = 180°$ 5] Reflex angle $180° < x < 360°$ **Lineat pair of Angles** If sum of two adjacent angles is equal to 180°, then the angles make a lineat pair $\angle a + \angle b = 180°$ $\therefore \angle a$ and $\angle b$ make a lineat pair	1] Knowledge - Students are able to know types and details of angles. 2] Understanding Students are able to understand lineat pair of angles. 3] Application - Students are able to apply types of angles to solve varions examples

अध्ययनानुभव (Learning Experience)	
शिक्षक कृती (Teacher Activity)	विद्यार्थी कृती (Student Activity)
Teacher asks some questions related to the topic.	Students give appropriate answers to the asked questions.
Q1] What are two examples of obtuse and reflex angles.	Ans] Examples of obtuse angles are 112° and 177° Examples of reflex angles are 210° and 300°
Q2] Find the measure of angle that is supplementary to 137°?	Ans] let x be the angle needed $x + 137° = 180°$ $x = 180° - 137°$ $x = 43°$
Q3] What is the measure of a complete angle?	Ans] The measure of a complete angle is 360°
Q4] If $3x + 24°$ and $5x - 16°$ are congruent then find the value of x	Ans] $3x + 24° = 5x - 16°$ $24° + 16° = 5x - 3x$ $2x = 40°$ $x = \frac{40°}{2}$ $x = 20°$

पाठाच्या पायऱ्या (Steps of Lesson)	अध्यापन मुद्दे (Teaching Points)	उद्दिष्टे व स्पष्टीकरणे (Objectives with Specification
	Parallel lines and a transversal  Any line which intersect two or more parallel lines is called a transversal. 1] Pair of corresponding angles are equal 2] Pair of alternate angles are equal 3] Pair of alternate exterior and interior angles are equal. 4] Co-interior angles are supplimentary.	1] Knowledge - students are able to know about parallel lines and transversal. 2] Understanding - students are able to understand angles formed by parallel lines and transversal. 3] Application - students are able to apply the knowledge to solve various examples.

अध्ययनानुभव (Learning Experience)	
शिक्षक कृती (Teacher Activity)	विद्यार्थी कृती (Student Activity)
Teachers ask some questions related to the topic	Students give appropriate answers to the asked questions.
Q1] What are parallel lines?	Ans] Two lines which do not intersect each other and are always at a constant distance from each other are called parallel lines.
Q2] What are intersecting lines?	Ans] Two lines which are not parallel but intersect each other in a common point are called intersecting lines.
Q3] What are perpendicular lines?	Ans] When two lines meet or intersect at an angle of 90°, then they are perpendicular to each other.
Q4] What are the characteristics of alternate angles?	Ans] The alternate interior angles are always equal.

पाठाच्या पायऱ्या (Steps of Lesson)	अध्यापन मुद्दे (Teaching Points)	उद्दिष्टे व स्पष्टीकरणे (Objectives with Specification)
RECAPITULATION	1] Types of Angles →a] acute angle b] right angle c] obtuse angle d] straight angle e] Reflex angle 2] Linear pair of angles 3] Parallel lines and intersecting lines. 4] Parallel lines and a transversal	*] To revise the topic taught by the teacher *] To evaluate the topic understood by the students. *] To test the knowledge gained by students regarding lines and angles.

अध्ययनानुभव (Learning Experience)	
शिक्षक कृती (Teacher Activity)	विद्यार्थी कृती (Student Activity)
Teacher asks some questions related to the topic.	Students give appropriate answers to the asked questions.
1] What is a transversal?	Ans] Any line which intersects two or more parallel lines is called a transversal.
2] Three angles at a point are 135°, 75° and x. Find the value of x.	Ans] Sum of angles at a point is 360° $135° + 75° + x = 360°$ $210° + x = 360°$ $x = 360° - 210°$ $x = 150°$
3] Define line.	Ans] A line is a figure in geometry, which has only length and no width in a two-dimensional plane and extends indefinately.
4] What are corresponding angles?	Ans] The angles formed when a transversal intersects any two parallel lines are called corresponding angles

पाठाच्या पायऱ्या Steps of the Lesson	अध्यापन मुद्दे Teaching Points	उद्दिष्टें व विशिष्टके Objectives with Specification
HOMEWORK		✱] To utilize the free time ✱] To revise the topic taught ✱] To create interest in the topic

फलक सार
Black Board Summary

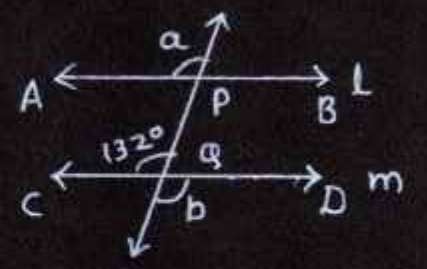
Day - Wednesday
Date - 11/10/23

Class - IX
Sub - Mathematics
Topic - Lines and Angles

On Roll -
Present -
Absent -

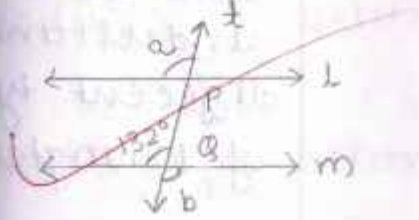
Parallel lines and a transversal

AB || CD i.e. l || m and line t is a transversal



Homework - In the figure, l || m and line t intersects lines l and m at P and Q. Find the sum - '2a + b'.

अध्ययनानुभव (Learning Experience)

शिक्षक कृती (Teacher Activity)	विद्यार्थी कृती (Student Activity)
The teacher gives homework written on the blackboard. Homework - In the figure $l \parallel m$ and line t intersect lines l and m at P and Q. Find - '2a+b'  	Students write it down and solve it in their respective notebooks.

अभिप्राय (Remarks)

पर्यवेक्षकाची सही
(Sign. of Supervisor)

पाठांक S.No 9

विषय Subject Mathematics

शाळा School V.L. Convent

विषयांश Topic Triangles - Congru

पाठ साहित्य Material Aids Chalk, blackboard, duster

पूर्व ज्ञान Previous Knowledge Types of triangle

पाठाच्या पायऱ्या Steps of the Lesson	अध्यापन मुद्दे Teaching Points	उद्दिष्टे व विशिष्टके Objectives with Specification
INTRODUCTION	1] Types of Triangles 2] congruence in triangles.	*] students are able to understand different types of triangles. *] To enable students to predict different congruence conditions *] To enable students to identify triangular inequalities.
statement of Aim - Today, we		are going to

दिनांक Date 17/10/23

वर्ग Class IX

तासिका अवधी Length of the Period 35 min

अध्यायनानुभव Learning Experience

अध्यापक कृती Teacher's Activities	छात्र कृती Student's Activities
Teacher asks some introductory questions	Students give appropriate answers to the asked questions.
What is a triangle?	Ans] A polygon which has three sides and three angles is called triangle
What is an equilateral triangle?	Ans] The triangle whose three sides are of equal length is called equilateral triangle.
What is the sum of three angles of a triangle?	Ans] Sum of three angles of a triangle is always 180°
Study the topic Triangles.	

अध्ययनानुभव (Learning Experience)	
शिक्षक कृती (Teacher Activity)	विद्यार्थी कृती (Student Activity)
Teacher asks some questions related to the topic	Students give appropriate answers to the asked questions.
1] What are the types of triangles on the basis of angles?	Ans] Three types of triangles on the basis of angles are i] Acute angled triangle ii] Right angled triangle iii] obtuse angled triangle
2] What are the types of triangles on the basis of sides?	Ans] Three types of triangles on the basis of sides are i] Equilateral triangle ii] Isosceles triangle iii] Scalene triangle.
3] Identify the shape of triangle if in $\triangle PQR$, $\angle P = \angle Q + \angle R$	Ans] By using angle sum property, $\angle P + \angle Q + \angle R = 180^\circ$ $\angle P + \angle P = 180^\circ$ $2\angle P = 180^\circ$ $\angle P = 180^\circ/2 = 90^\circ$ $\therefore \triangle PQR$ is right angled $\triangle$
4] In $\triangle PQR$, $PQ = PR$ and $\angle Q = 70^\circ$, Find P.	Ans] In $\triangle PQR$, $PQ = PR$ $\therefore \angle R = \angle Q$ $\angle P + \angle Q + \angle R = 180^\circ$ $\angle P + 70^\circ + 70^\circ = 180^\circ$ $\angle P + 140^\circ = 180^\circ$ $\angle P = 180^\circ - 140^\circ$ $\angle P = 40^\circ$

पाठाच्या पायऱ्या (Steps of Lesson)	अध्यापन मुद्दे (Teaching Points)	उद्दिष्टे व स्पष्टीकरणे (Objectives with Specification)
	Congruence in Triangles -	1] Knowledge - students are able to know congruence conditions in triangles
	Two triangles are congruent if their corresponding sides and angles are equal.	
	There are five conditions to prove congruence in triangles	
	1] SSS (side - side - side)	2] understanding - students are able to understand corresponding parts of congruent triangles.
	2] SAS (side - Angle - side)	
	3] ASA (Angle - side - Angle)	3] Application - students are able to apply congruency criterion to solve various examples.
	4] AAS (Angle - Angle - side)	
	5] RHS (Right angle - hypotenuse - side)	

अध्ययनानुभव (Learning Experience)	
शिक्षक कृती (Teacher Activity)	विद्यार्थी कृती (Student Activity)
Teacher asks some questions related to the topic	Students give appropriate answers to the asked questions.
[2] What can you say about angles in an isosceles triangle?	Ans] In an isosceles triangle two sides are equal. The angles opposite to equal sides are equal to one another.
[3] Find the three equalities of the corresponding angle if $\triangle ABC \cong \triangle PQR$ using SSS congruence rule	Ans] Using SSS congruency criterion, three equalities are $\angle A = \angle P$ $\angle B = \angle Q$ $\angle C = \angle R$
[3] Determine the longest side in $\triangle PQR$ if $\angle Q = 90°$	Ans] If $\angle Q = 90°$, then side opposite to $\angle Q$ is PR which is hypotenuse $\therefore$ The longest side of $\triangle PQR$ is PR.
[4] Determine the measure of all the angles in an equilateral triangle.	Ans] Let each angle of equilateral triangle be x $x + x + x = 180°$ $3x = 180°$ $x = 180°/3$ $x = 60°$ $\therefore$ Each angle in equilateral triangle is 60°.

पाठाच्या पायऱ्या (Steps of Lesson)	अध्यापन मुद्दे (Teaching Points)	उद्दिष्टे व स्पष्टीकरणे (Objectives with Specification)
RECAPITULATION	1] Types of Triangles → a] Acute angled b] Right angled c] Obtuse angled → d] Equilateral e] Isosceles f] Scalene 2] Congruence in Triangles → a] SSS b] SAS c] ASA d] AAS e] RHS	*] To revise the topic taught by the teacher. *] To evaluate the topic understood by the students *] To test the knowledge gained by the students regarding Triangles

अध्ययनानुभव (Learning Experience)	
शिक्षक कृती (Teacher Activity)	विद्यार्थी कृती (Student Activity)
Teacher asks some questions related to the topic	Students give appropriate answers to the asked questions.
Q.1] What can you say about sum of any two sides of a triangle wrt third side?	Ans] The sum of any two sides of a triangle is always greater than the third side.
Q.2] If PQ = 6 cm, QR = 4cm and PR = 1.5 cm, is triangle PQR possible?	Ans] PQ = 6cm; QR = 4 cm; PR = 1.5 cm QR + PR = 4 + 1.5 = 5.5 cm which is less than PQ = 6 cm ∴ △PQR is not possible.
Q.3] What is the measure of each exterior angle of an equilateral triangle?	Ans] Exterior angle = 180 - interior angle = 180 - 60 = 120° ∴ Each exterior angle is 120°
Q.4] The sum of two angles of a triangle is equal to its third angle. Find the third angle.	Ans] In a triangle, 45° + 45° = 90° ∴ first angle = 45°/30° second angle = 45°/60° third angle = 90°

पाठाच्या पायऱ्या Steps of the Lesson	अध्यापन मुद्दे Teaching Points	उद्दिष्टे व विशिष्टके Objectives with Specification
HOMEWORK		*] To create interest in the taught topic *] To utilize the free time. *] To understand the taught concept properly

फलक सार

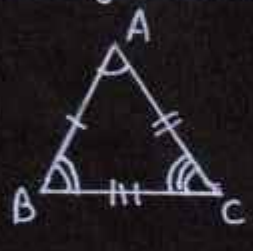
Black Board Summary

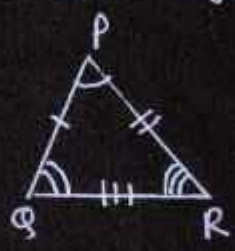
Day - Friday
Date - 13/10/23

Class - IX
Sub - Mathematics
Topic - Triangles

On roll -
Present -
Absent -

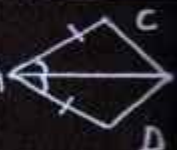
Congruence in Triangles



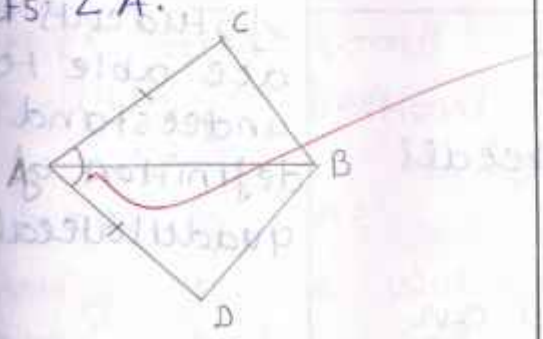


1] SSS - side-side-side
2] SAS - side-angle-side
3] ASA - angle-side-angle
4] AAS - angle-angle-side
5] RHS - Right angle - Hypotenuse - side

Homework - In quadrilateral ABCD AC = AD and AB bisects ∠A. Show that △ABC ≅ △ABD



अध्ययनानुभव (Learning Experience)

शिक्षक कृती (Teacher Activity)	विद्यार्थी कृती (Student Activity)
Teacher gives homework written on the blackboard. Homework - In quadrilateral ABCD, AC = AD. Show that $\triangle ABC \cong \triangle ABD$. Also, AB bisects $\angle A$.  	Students write it down and solve it in their respective notebooks.

अभिप्राय (Remarks)

पर्यवेक्षकाची सही
(Sign. of Supervisor)

पाठांक S.No 10

विषय Subject Mathematics

शाळा School V.L. Convent

विषयांश Topic Quadrilaterals

पाठ साहित्य Material Aids Chalk, Blackboard, Duster

पूर्व ज्ञान Previous Knowledge Quadrilateral basic

पाठाच्या पायऱ्या Steps of the Lesson	अध्यापन मुद्दे Teaching Points	उद्दिष्टे व विशिष्टके Objectives with Specificatio
INTRODUCTION	1] Types of quadrilaterals 2] Theorems on quadrilaterals	*] Students are able to understand definition of quadrilateral *] To enable students to know different types of quadrilaterals *] To enable students to know theorems related to quadrilaterals
Statement of Aim - Today, we		are going to

दिनांक Date 20/10/23

(Theorems)

वर्ग Class IX

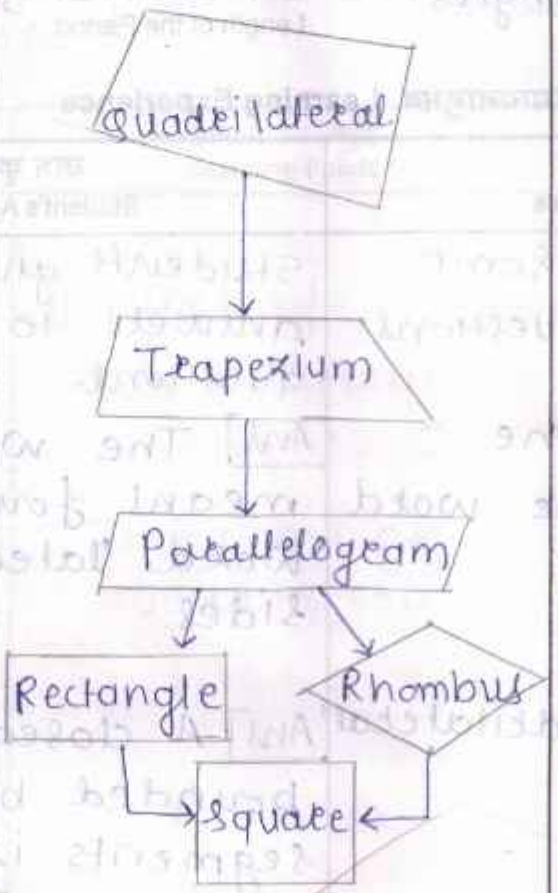
diagonals, angles

तासिका अवधी Length of the Period 35 min

अध्यायनानुभव Learning Experience

अध्यापक कृती Teacher's Activities	छात्र कृती Student's Activities
Teacher asks some introductory questions	Students give appropriate answers to the asked questions.
Q 1] What is the meaning of the word quadrilateral?	Ans] The word 'quad' means four and the word 'lateral' means sides.
Q 2] Define 'quadrilateral'	Ans] A closed figure plane bounded by four line segments is called quadrilateral.
Q 3] Give some examples of quadrilaterals	Ans] Square, Rectangle, Rhombus, Kite are some examples of quadrilaterals.

Learn about quadrilaterals.

पाठाच्या पायऱ्या (Steps of Lesson)	अध्यापन मुद्दे (Teaching Points)	उद्दिष्टे व स्पष्टीकरणे (Objectives with Specification)
PRESENTATION	Family of Quadrilaterals  All the different types of quadrilaterals have different properties depending upon their sides, angles and diagonals	1] Knowledge students are able to know the family of quadrilaterals 2] Understanding students are able to understand the classification of quadrilaterals. 3] Application students are able to use classification to solve various example

अध्ययनानुभव (Learning Experience)	
शिक्षक कृती (Teacher Activity)	विद्यार्थी कृती (Student Activity)
Teacher asks some questions related to the topic	students give appropriate answers to the asked questions.
Q.1] What is the name of a quadrilateral whose opposite sides are equal and all the angles 90°?	Ans] Rectangle is a quadrilateral whose opposite sides are equal and all angles are 90°
Q.2] What are the special types of Parallelogram?	Ans] The special types of the parallelogram are Square, Rectangle and Rhombus
Q.3] A rhombus with right angle will represent which type of quadrilateral?	Ans] A rhombus with right angle will become a Square
Q.4] What is the sum of all the interior angles of a quadrilateral?	Ans] The sum of interior angles of a quadrilateral is 360°

पाठाच्या पायऱ्या (Steps of Lesson)	अध्यापन मुद्दे (Teaching Points)	उद्दिष्टे व स्पष्टीकरणे (Objectives with Specification)
	Theorems - Quadrilaterals 1] A diagonal of a $\|\|^m$ divides it into two congruent triangles. 2] In a $\|\|^m$, opposite sides are equal. 3] If each pair of opposite sides of a quadrilateral is equal, then it is a $\|\|^m$ 4] In a $\|\|^m$, opposite angles are equal 5] If in a quadrilateral each pair of opposite angles is equal, then it is a parallelogram 6] The diagonals of a $\|\|^m$ bisect each other	1] Knowledge - students are able to know various theorems based on quadrilaterals 2] Understanding students are able to understand proofs of all these theorems 3] Application - students are able to apply quadrilateral theorems to solve various examples.

अध्ययनानुभव (Learning Experience)	
शिक्षक कृती (Teacher Activity)	विद्यार्थी कृती (Student Activity)
Teacher asks some questions related to the topic	Students give appropriate answers to the asked questions.
Q 1] The three angles of a quadrilateral are 60°, 30° and 110°. What is the fourth angle?	Ans] We know that, $\angle 1 + \angle 2 + \angle 3 + \angle 4 = 360°$ $60° + 30° + 110° + \angle 4 = 360°$ $\angle 4 = 360° - (60° + 30° + 110°)$ $= 100°$ ∴ Fourth angle is 100°
Q 2] In which quadrilateral, diagonals are equal and also bisect each other at 90°	Ans] In square, the diagonals are equal and bisect each other at 90°.
Q 3] Find all the angles of a ∥gm, if one angle is 80°	Ans] In a ∥gm, opposite angles are equal ∴ $\angle 1 = \angle 3 = 80°$ $\angle 2 = \angle 4 = 100°$
Q 4] Is it possible to draw a quadrilateral whose all angles are obtuse angles	Ans] To have all obtuse angles, they will be greater than 360°. So, it is not possible for a quadrilateral to have all angles as obtuse angles.

पाठाच्या पायऱ्या (Steps of Lesson)	अध्यापन मुद्दे (Teaching Points)	उद्दिष्टे व स्पष्टीकरणे (Objectives with Specification)
RECAPITULATION	1] Family of Quadrilaterals → a] Trapezium b] Parallelogram c] Rectangle d] Rhombus e] Square 2] Quadrilaterals - Theorems	*] To revise the topic taught by the teacher. *] To evaluate the topic understood by the students *] To test the knowledge gained by students regarding quadrilaterals

अध्ययनानुभव (Learning Experience)	
शिक्षक कृती (Teacher Activity)	विद्यार्थी कृती (Student Activity)
Teacher asks some questions related to the topic	students give appropriate answers to the asked questions.
Q.1] ABCD is a rhombus, if $\angle ACB = 30°$, then what is the measure of $\angle ADB$?	Ans] Angle $\angle A + \angle B + \angle C + \angle D = 360°$ $\angle C = \angle A = 30°$ let $\angle B = \angle D = x$ $30 + x + 30 + x = 360°$ $2x + 60 = 360°$ $x = 300/2 = 150°$
Q.2] If the diagonals of a quadrilateral bisect each other, what is the name of the quadrilateral?	Ans] If the diagonals of a quadrilateral bisect each other, the quadrilateral is parallelogram.
Q.3] A quadrilateral with one pair of opposite parallel sides is called?	Ans] A quadrilateral with one pair of opposite parallel sides is called Trapezium.
Q.4] What is the name of quadrilateral in which both the diagonals are completely contained within the figure?	Ans] A quadrilateral in which both the diagonals are completely contained within a figure is called convex quadrilateral

पाठाच्या पायऱ्या Steps of the Lesson	अध्यापन मुद्दे Teaching Points	उद्दिष्टे व विशिष्टके Objectives with Specification
HOMEWORK		*] To create interest in the topic taught *] To utilize the free time *] To understand the taught concept properly.

फलक सार
Black Board Summary

Day - Tuesday
Date - 17/10/23

Class - IX
Sub - Mathematics
Topic - Quadrilaterals

On Roll -
Present -
Absent -

Quadrilateral -

A closed figure plane bounded by four lines segment is called as quadrilateral.

Types of quadrilateral

1] Trapezium
2] Parallelogram
3] Rhombus
4] Rectangle
5] Square

Homework - 1] If the diagonals of a parallelogram are equal, then prove that it is a rectangle.

अध्ययनानुभव (Learning Experience)

शिक्षक कृती (Teacher Activity)	विद्यार्थी कृती (Student Activity)
Teacher gives homework written on blackboard Homework- 1) The angles of a quadrilateral are in the ratio 9:13. Find all the angles of quadrilateral. 2) If the diagonals of a parallelogram are equal, then prove that it is a rectangle.	students write it down and solve in their respective notebooks

अभिप्राय (Remarks)

Kedbarde

पर्यवेक्षकाची सही

(Sign. of Supervisor)

पाठांक S.No 11 | विषय Subject Mathematics

शाळा School V.L. convent | विषयांश Topic Circles Its parts

पाठ साहित्य Material Aids Chalk, Blackboard, Duster | पूर्व ज्ञान Previous Knowledge Radius, Diameter,

पाठाच्या पायऱ्या Steps of the Lesson	अध्यापन मुद्दे Teaching Points	उद्दिष्टे व विशिष्टके Objectives with Specification
INTRODUCTION	1] Parts of circle 2] circles Theorems.	*] To enable students to know various parts of circle *] To develop twinking, reasoning and imagination among students *] To enable students to understand applications of circles.
Statement of Aim - Today, we are going		

दिनांक Date 25/10/23

वर्ग Class IX

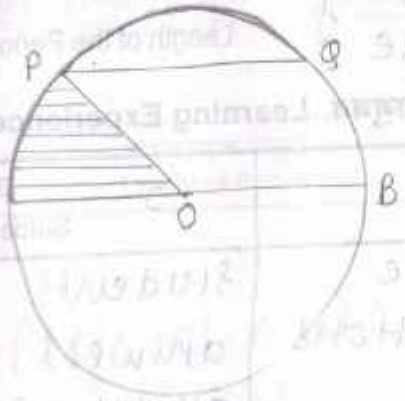
Theorems

तासिका अवधी Length of the Period 35 min

Circumference, Area of circle

अध्यायनानुभव Learning Experience

अध्यापक कृती Teacher's Activities	छात्र कृती Student's Activities
Teacher asks some introductory questions	Students give appropriate answers to the asked questions.
Q1] What is a circle?	Ans] Collection of all points in a plane which are at a fixed distance from centre is called circle.
Q2] What are concentric circles?	Ans] Two or more circles having same centre but different radii are called concentric circles.
Q3] Who invented circle?	Ans] The first theorems relating to circles are attributed to Thales around 650 BC.
to study circles	

पाठाच्या पायऱ्या (Steps of Lesson)	अध्यापन मुद्दे (Teaching Points)	उद्दिष्टे व स्पष्टीकरणे (Objectives with Specification)
PRESENTATION	Parts of circle  1] centre - O 2] Radius - OA, OB 3] Diameter - AB 4] Chord - PQ 5] Sector - AOP 6] minor arc - APQ 7] Major arc - QBA 8] Segment - PQ	1] Knowledge Students are able to know about various parts of a circle and their relationship with each other 2] Understanding Students are able to understand parts of circle. 3] Application Students are able to apply knowledge of parts of circle to solve various examples.

अध्ययनानुभव (Learning Experience)	
शिक्षक कृती (Teacher Activity)	विद्यार्थी कृती (Student Activity)
Teacher asks some questions related to the topic	students give appropriate answers to the asked question.
Q.1] If the radius of a circle is 2cm, what is its diameter?	Ans] If the radius of a circle is 2cm, its diameter is 4cm.
Q.2] What is the longest chord of a circle?	Ans] Diameter is the longest chord of a circle.
Q.3] How many lines of symmetry does a circle have?	Ans] A circle has infinite lines of symmetry.
Q.4] What is the circumference of a circle if the radius of the circle is 7cm?	Ans] The circumference of a circle is $2\pi r$ $C = 2 \times \frac{22}{7} \times 7$ $= 44\,cm$ ∴ circumference of circle is 44 cm.

पाठाच्या पायऱ्या (Steps of Lesson)	अध्यापन मुद्दे (Teaching Points)	उद्दिष्टे व स्पष्टीकरणे (Objectives with Specification)
	Circles Theorems- 1] Equal chords of a circle subtend equal angles at the centre 2] The perpendicular from the centre of a circle to a chord bisects the chord 3] 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. 4] Angles in the same segment of a circle are equal	1] Knowledge Students are able to know about theorems of circle and their proofs with converse. 2] Understanding Students are able to understand theorems of circle and their converse 3] Application Students are able to apply knowledge of circles to solve examples

अध्ययनानुभव (Learning Experience)	
शिक्षक कृती (Teacher Activity)	विद्यार्थी कृती (Student Activity)
Teacher asks some questions related to the topic.	Students give appropriate answers to the asked questions.
Q.1] What is a cyclic quadrilateral?	Ans] A quadrilateral which has its all four vertices lying on a circle is called cyclic quadrilateral.
Q.2] What is the sum of either pair of opposite angle of a cyclic quadrilateral?	Ans] The sum of either pair of opposite angles of a cyclic quadrilateral is 180°
Q.3] What is the whole arc of a circle called?	Ans] The whole arc of a circle is called circumference of a circle.
Q.4] PS and RS are two chords such that PQ = 10 cm and RS = 24 cm and PQ ∥ RS. The distance between PQ and RS is 17 cm. Find the radius of circle.	Ans] PQ = 10 cm RS = 24 cm The radius of the given circle is 13 cm.

पाठाच्या पायऱ्या (Steps of Lesson)	अध्यापन मुद्दे (Teaching Points)	उद्दिष्टे व स्पष्टीकरणे (Objectives with Specification)
RECAPITULATION	1] Parts of a circle → a] centre b] Radius c] Diameter d] chord e] sector f] minor arc g] major arc h] segment 2] circle - Theorems	*] To revise the topic taught in the class *] To evaluate the knowledge gained by students x] To test the concepts understood by students regarding circles

अध्ययनानुभव (Learning Experience)	
शिक्षक कृती (Teacher Activity)	विद्यार्थी कृती (Student Activity)
Teacher asks some questions related to the topic.	Students give appropriate answers to the asked questions.
Q1] What can you say about angles subtended by equal chords at the centre?	Ans] Equal chords of the ~~sub~~ congruent circles subtend equal angles at the centers.
Q2] If there are two seperate circles drawn apart from each other, how many common points do they have?	Ans] If there are two seperate circles drawn apart from each other, then they have no common points in them.
Q3] What is the measure of the angle subtended by the diameter of a circle?	Ans] The angle subtended by a diameter at the centre is 180°.
Q4] If AB = 12 cm, BC = 16 cm and AB is perpendicular to BC, then the radius of circle passing through points A, B and C is?	Ans] AB = 12 cm BC = 16 cm $AC^2 = BC^2 + AB^2$ $= 12^2 + 16^2 = 144 + 256$ $= 400$ AC = 20 cm ∴ diameter = 20 cm ∴ radius of circle is 10 cm

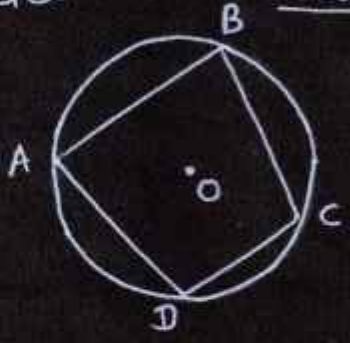
पाठाच्या पायऱ्या Steps of the Lesson	अध्यापन मुद्दे Teaching Points	उद्दिष्टें व विशिष्टके Objectives with Specification
HOMEWORK		*] To utilize the free time *] To create interest in the topic taught *] To understand the taught concept properly

फलक सार
Black Board Summary

Day - Friday
Date - 20/10/23
Class - IX
Sub - Mathematics
Topic - circles
On Roll -
Present -
Absent -

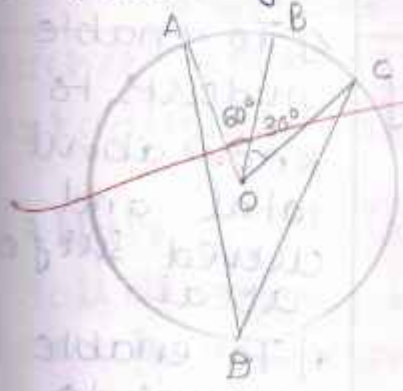
cyclic quadrilateral

A quadrilateral which has its all four vertices lying on a circle is called cyclic quadrilateral.



Homework - In the given figure, find the value of ∠ADC

अध्ययनानुभव (Learning Experience)

शिक्षक कृती (Teacher Activity)	विद्यार्थी कृती (Student Activity)
The teacher gives homework written on the blackboard. Homework- In the given figure, the value of ∠ADC is-  	Students write it down and solve it in their respective notebooks.

अभिप्राय (Remarks)

पर्यवेक्षकाची सही
(Sign. of Supervisor)

पाठांक S.No. 12 | विषय Subject Mathematics

शाळा School V.L. convent | विषयांश Topic Surface area of

पाठ साहित्य Material Aids chalk, Blackboard, Duster | पूर्व ज्ञान Previous Knowledge Area of rectangle

पाठाच्या पायऱ्या Steps of the Lesson	अध्यापन मुद्दे Teaching Points	उद्दिष्टे व विशिष्टके Objectives with Specification
INTRODUCTION	1] Surface areas of → a] cube b] cuboid c] cone d] sphere	*] To enable students to know about total and curved surface areas *] To enable students to understand how surface areas are calculated *] To develop thinking, reasoning and imagination among students
Statement of Aim - Today, we	are going to	

दिनांक Date 27/10/23

वर्ग Class IX

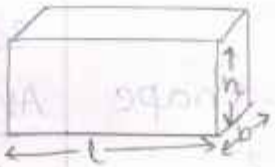
तासिका अवधी Length of the Period 35 min

cube, cuboid, cone, sphere

ude and circle

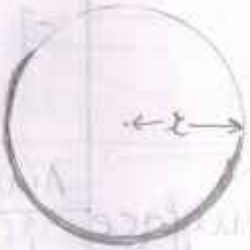
अध्यायनानुभव Learning Experience

अध्यापक कृती Teacher's Activities	छात्र कृती Student's Activities
Teacher asks some introductory questions	Students give appropriate answers to the asked questions.
Q.1] Name some 3D solids you have learnt till now?	Ans] Cube, cuboid, cone, sphere, hemisphere and cylinder are some 3D solids.
Q.2] What is the shape of your book?	Ans] Our book is cuboid shaped.
Q.3] How do you calculate how much paper you need to cover your textbook?	Ans] We need to find areas of two faces of textbook and one face of the binding side and add them.
learn about surface	areas of solids.

पाठाच्या पायऱ्या (Steps of Lesson)	अध्यापन मुद्दे (Teaching Points)	उद्दिष्टे व स्पष्टीकरणे (Objectives with Specification)
PRESENTATION	Surface area of 1] cube  TSA = 6 × area of each face = 6 × (a × a) = $6a^2$ unit^2 or sq. units TSA of cube = $6a^2$ 2] cuboid  TSA = 2 × area of face1 + 2 × area of face2 + 2 × area of face3 = 2 × lb + 2 × bh + 2 × lh = 2 (lb + bh + lh) sq. units or unit^2 TSA of cuboid = 2 (lb + bh + lh)	1] Knowledge Students are able to know about surface areas of cube and cuboid 2] Understanding students are able to understand how surface areas of cube and cuboid are calculated 3] Application- students are able to apply surface area formula to solve various example

अध्ययनानुभव (Learning Experience)

शिक्षक कृती (Teacher Activity)	विद्यार्थी कृती (Student Activity)
Teacher asks some questions related to the topic	Students give appropriate answers to the asked questions.
Q-1] What is surface area ?	Ans] The space occupied by a two diamensional flat surface is called the surface area.
Q-2] How many types of areas surface are there?	Ans] There are two types of surface areas 1] Total surface area 2] curved surface area
Q-3] How do you calculate total surface areas of a cube?	Ans] The side of a cube is a units. So its total surface area is equal to $6a^2$ unit^2
Q-4] How do you calculate total surface area of cuboid ?	Ans] A cuboid has length, breadth and height. So, its total surface ared is $2(lb + bh + lh)$ unit^2

पाठाच्या पायऱ्या (Steps of Lesson)	अध्यापन मुद्दे (Teaching Points)	उद्दिष्टे व स्पष्टीकरणे (Objectives with Specification)
	Surface area of 1] Cone  TSA = Area of curved surface + area of base $= \frac{1}{2} \times l \times 2\pi r + \pi r^2$ $= \pi r l + \pi r^2$ $= \pi r (l + r)$ 2] Sphere  TSA = 4 x area of a circle with radius r $= 4 \times \pi r^2$ $= 4\pi r^2$ TSA $= 4\pi r^2$	1] Knowledge - students are able to know about surface area of cone and sphere 2] Understanding students are able to understand how surface areas of cone and sphere are calculated. 3] Application - students are able to apply surface area formulas to solve examples.

अध्ययनानुभव (Learning Experience)	
शिक्षक कृती (Teacher Activity)	**विद्यार्थी कृती (Student Activity)**
The teacher asks some questions related to the topic Q 1] Calculate total surface area of a cube having side 5cm.	Students give appropriate answers to the asked questions. Ans] TSA of cube $= 6a^2$ $= 6 \times 5 \times 5$ $= 6 \times 25$ $= 150\ cm^2$ ∴ Total surface area of cube is $150\ cm^2$
Q 2] Calculate total surface area of a cuboid whose length is 2cm, breadth is 1cm and height is 3cm.	Ans] TSA of cuboid $= 2(lb+bh+lh$ $= 2(2\times1 + 1\times3 + 2\times3)$ $= 2(2+3+6) = 2 \times 11$ $= 22\ cm^2$ ∴ Total surface area of cuboid is $22\ cm^2$
Q 3] How do you calculate total surface areas of cone?	Ans] For a cone having radius 'r' and slanting height 'l', total surface area is calculated by formula $\pi r(l+r)$
Q 4] How do you calculate total surface area of a sphere?	Ans] For a sphere having radius r, total surface area is calculated by formula $4\pi r^2$

पाठाच्या पायऱ्या (Steps of Lesson)	अध्यापन मुद्दे (Teaching Points)	उद्दिष्टे व स्पष्टीकरणे (Objectives with Specification)
RECAPITULATION	Surface areas of 1] cube- $6a^2$ 2] cuboid $2(lb+bh+lh)$ 3] cone- $= \pi r(l+r)$ 4] sphere $4\pi r^2$	*] To revise the topic taught in the class. *] To evaluate the knowledge gained by the students. *] To test the concepts understood by the students regarding surface areas of cube, cuboid cone, sphere.

अध्ययनानुभव (Learning Experience)	
शिक्षक कृती (Teacher Activity)	विद्यार्थी कृती (Student Activity)
The teacher asks some introductory questions.	Students give appropriate answers to the asked questions.
Q.1] Find the total surface area of a cone whole slant height is 10 cm and base radius is 7 cm.	Ans] TSA of cone $= \pi r(l+r)$ $= \frac{22}{7} \times 7 \times (10+7)$ $= 22 \times 17 = 374\ cm^2$ ∴ Total surface area of the given cone is $374\ cm^2$
Q.2] Find the surface area of a sphere of radius 7 cm.	Ans] TSA of sphere $= 4\pi r^2$ $= 4 \times \frac{22}{7} \times 7 \times 7$ $= 4 \times 22 \times 7 = 88 \times 7 = 616\ cm^2$ Total surface area of the given sphere is $616\ cm^2$
Q.3] Find the total surface area of a cuboid having equal length, breadth & height.	Ans] let length, breadth and height of the given cuboid be x cm TSA $= 2(x^2+x^2+x^2) = 2 \times 3x^2$ $= 6x^2$ unit^2
Q.4] What is the total surface area of a hemisphere?	Ans] Total surface area of a sphere is $4\pi r^2$ ∴ For a hemisphere it is $2\pi r^2$ Adding base area to it πr^2 ∴ TSA of hemisphere $= 2\pi r^2 + \pi r^2$ $= 3\pi r^2$

पाठाच्या पायऱ्या Steps of the Lesson	अध्यापन मुद्दे Teaching Points	उद्दिष्टे व विशिष्टके Objectives with Specification
HOMEWORK		*] To utilize the free time. *] To create interest in the topic taught *] To understand the taught concept properly.

फलक सार

Black Board Summary

Day - Wednesday
Date - 25/10/23

Class - IX
Sub - Mathematics
Topic - surface Areas of solids

On Roll -
Present -
Absent -

Total surface areas of solids -

1] Cube - $6a^2$

2] Cuboid - $2(lb+bh+lh)$

3] Cone - $\pi r(l+r)$

4] Sphere - $4\pi r^2$

Homework - 1] Find the total surface area of a cone whose slant height is 5 cm and base radius is 7 cm

अध्ययनानुभव (Learning Experience)

शिक्षक कृती (Teacher Activity)	विद्यार्थी कृती (Student Activity)
The teacher gives homework written on the blackboard. Homework- 1] Find total surface area of a cone whose slant height is 5 cm and base radius is 7cm. 2] Find the surface area of a hemisphere of radius 7 cm.	Students write it down and solve in their notebooks.

अभिप्राय (Remarks)

पर्यवेक्षकाची सही
(Sign. of Supervisor)

पाठांक S.No. 13

विषय Subject Mathematics

शाळा School V. L. convent

विषयांश Topic Volume of cube,

पाठ साहित्य Material Aids Chalk, Blackboard, Duster

पूर्व ज्ञान Previous Knowledge Volume, capacity

पाठाच्या पायऱ्या Steps of the Lesson	अध्यापन मुद्दे Teaching Points	उद्दिष्टे व विशिष्टके Objectives with Specification
INTRODUCTION	Volume of 1] cube 2] cuboid 3] cone 4] sphere	*] To enable students to know about volume of solids *] To enable students to understand volume *] To develop thinking, reasoning and imagination among students
Statement of Aim - Today, we are going		

...oid, Cone and Sphere | वर्ग Class: IXth

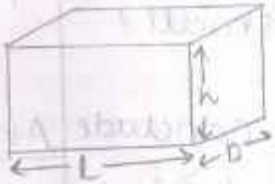
... container | तासिका अवधी Length of the Period: 35 min

दिनांक Date: 31/10/23

अध्ययनानुभव Learning Experience

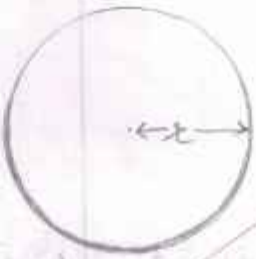
अध्यापक कृती Teacher's Activities	छात्र कृती Student's Activities
The teacher asks some introductory questions.	Students give appropriate answers to the asked questions.
Q.1] If you go to buy a juice bottle, which bottle do you prefer big or small?	Ans] We do prefer big bottle of juice, because it contains more juice
Q.2] How do you conclude that big bottle has more juice?	Ans] We prefer big bottle of juice because big bottle has more volume.
Q.3] What is volume in your words?	Ans] Volume is the amount of space occupied by any three-diamensional solid.

to learn about volume of 3D shapes

पाठाच्या पायऱ्या (Steps of Lesson)	अध्यापन मुद्दे (Teaching Points)	उद्दिष्टे व स्पष्टीकरणे (Objectives with Specification)
PRESENTATION	Volume of 1] cube  Volume of cube = side x side x side = a x a x a = a^3 cu. units or unit^3 2] cuboid  Volume of cuboid = length x breadth x height = l x b x h cu units or unit^3	1] Knowledge - students are able to know about volumes of cube and cuboid 2] Understanding students are able to understand how formulas of volume of cube and cuboid are derived. 3] Application - students are able to apply formulas of volume to solve various examples

अध्ययनानुभव (Learning Experience)

शिक्षक कृती (Teacher Activity)	विद्यार्थी कृती (Student Activity)
Teacher asks some questions related to the topic	Students give appropriate answers to the asked questions.
Q1] Find the volume of a cuboid whose length = 5cm, width = 2cm and height = 3cm.	Ans] $l = 5cm$; $b = 2cm$; $h = 3cm$ Volume of cuboid $= l \times b \times h$ $= 5 \times 2 \times 3 = 30$ cu·cm ∴ Volume of the given cuboid is 30 cu·cm.
Q2] Find the volume of a cube whose side is 10 cm.	Ans] $a = 10cm$ Volume of a cube $= a \times a \times a$ $= 10 \times 10 \times 10$ $= 1000$ cu·cm. ∴ Volume of the given cube is 1000 cu·cm
Q3] How do we define volume of cubaid?	Ans] Volume of cuboid is the amount of space occupied by the walls of cuboid in a 3D space.
Q4] Does the order of cuboid matters to calculate the volume?	Ans] No, the order of cuboid does not matter if it is kept vertically or horizontally. The volume of the shape remains same.

पाठाच्या पायऱ्या (Steps of Lesson)	अध्यापन मुद्दे (Teaching Points)	उद्दिष्टे व स्पष्टीकरणे (Objectives with Specification)
	Volume of 3] Cone  For a cone with perpendicular height h and base radius r. Volume of cone $= \frac{1}{3} \pi r^2 h$ cu-units or unit^3 4] Sphere  For a sphere with radius r; Volume of sphere $= \frac{4}{3} \pi r^3$ cu-unit or unit^3	1] Knowledge- students are able to know about volume of cone and sphere. 2] Understanding students are able to understand formula of volume of cone and sphere 3] Application students are able to apply formulas of volume to solve various examples

अध्ययनानुभव (Learning Experience)	
शिक्षक कृती (Teacher Activity)	**विद्यार्थी कृती (Student Activity)**
Teacher asks some questions related to the topic.	Students give appropriate answers to the asked questions.
Q-1] Find the volume of a sphere of radius 11.2 cm.	Ans] $r = 11.2$ cm volume of sphere $= \frac{4}{3}\pi r^3$ $= \frac{4}{3} \times \frac{22}{7} \times 11.2 \times 11.2 \times 11.2$ $= 5887.32\ cm^3$ ∴ volume of given sphere is $5887.32\ cm^3$
Q-2] What is volume of a semisphere?	Ans] volume of a semisphere is half of the volume of a sphere. ∴ volume of semisphere $= \frac{2}{3}\pi r^3$
Q-3] Find the volume of a cone whose radius is 6cm and height is 7cm.	Ans] volume of the given cone $= \frac{1}{3}\pi r^2 h$ $= \frac{1}{3} \times \frac{22}{7} \times 6 \times 6 \times 7$ $= 264\ cm^3$
Q-4] The height and the slant height of a cone are 21 cm and 28 cm. Find the volume of the cone.	Ans] $r = 28$ cm $\quad h = 21$ cm $l = \sqrt{l^2 - h^2} = \sqrt{28^2 - 21^2}$ $= 7\sqrt{7}$ cm ∴ volume of cone $= \frac{1}{3}\pi r^2 h$ $= \frac{1}{3} \times \frac{22}{7} \times 7\sqrt{7} \times 7\sqrt{7} \times 21$ $= 7546\ cm^3$

पाठाच्या पायऱ्या (Steps of Lesson)	अध्यापन मुद्दे (Teaching Points)	उद्दिष्टे व स्पष्टीकरणे (Objectives with Specification)
RECAPITULATION	Volume of 1] cube a^3 2] cubaid $l \times b \times h$ 3] Cone $\frac{1}{3} \pi r^2 h$ 4] sphere $\frac{4}{3} \pi r^3$	*] To revise the topic taught in the class *] To evaluate the knowledge gained by students *] To test the concept understood by the students regarding volume of 3D shapes.

अध्ययनानुभव (Learning Experience)

शिक्षक कृती (Teacher Activity)	विद्यार्थी कृती (Student Activity)
Teacher asks some questions related to the topic.	Students give appropriate answers to the asked questions.
Q1] If two cubes of side 6 cm are joined face to face, then find the volume of the resulting cuboid.	Ans] If we join two cubes $l = 6+6 = 12$ cm; $b = 6$cm and $h = 6$cm ∴ Volume of resulting cuboid $= l \times b \times h = 12 \times 6 \times 6 = 432 cm^3$
Q2] Find the ratio of the total surface area and lateral surface area of a cube.	Ans] TSA of cube $= 6 side^2$ LSA of cube $= 4 side^2$ Ratio $= \frac{6\ side^2}{4 side^2} = \frac{3}{2}$ 3:2
Q3] Find the volume of a cone whose radius is 3.5 cm and height is 12cm.	Ans] Volume of cone $= \frac{1}{3}\pi r^2 h$ $= \frac{1}{3} \times \frac{22}{7} \times 3.5 \times 3.5 \times 12$ $= 154\ cm^3$
Q4] A hemispherical bowl has a radius of 3.5 cm. How much volume of water it would contain?	Ans] Volume of hemispherical bowl $= \frac{2}{3}\pi r^3$ $= \frac{2}{3} \times \frac{22}{7} \times 3.5 \times 3.5 \times 3.5$ $= 89.8\ cm^3$ ∴ volume of the given bowl is $89.8\ cm^3$

पाठाच्या पायऱ्या Steps of the Lesson	अध्यापन मुद्दे Teaching Points	उद्दिष्टें व विशिष्टके Objectives with Specification
HOMEWORK		*] To utilize the free time *] To create the interest in the topic taught. *] To understand the taught concept properly.

फलक सार

Black Board Summary

Day - Friday
Date - 27/10/23

Class - IX
Sub - Mathematics
Topic - Volume of solids

on roll -
Present -
Absent -

Volumes of solids

1] Cube $= a^3$

2] Cuboid $= l \times b \times h$

3] Sphere $= \frac{4}{3} \pi r^3$

4] hemisphere $= \frac{2}{3} \pi r^3$

5] cylinder $= \pi r^2 h$

6] Cone $= \frac{1}{3} \pi r^2 h$

Homework - Find the volume of a sphere whose radius is i] 7 cm ii] 0.63 m

अध्ययनानुभव (Learning Experience)

शिक्षक कृती (Teacher Activity)	विद्यार्थी कृती (Student Activity)
gives homework on blackboard Homework - The height of a cone is ... If its volume is ..., find the diameter ... ... the volume ... whose ... is - ... ii] 0.63 m.	students write it down and solve in their notebooks.

अभिप्राय (Remarks)

पर्यवेक्षकाची सही
(Sign. of Supervisor)

पाठांक S.No 14 | विषय Subject Mathematics

शाळा School V.L. convent | विषयांश Topic Square and square

पाठ साहित्य Material Aids Chalk, Blackboard, Duster | पूर्व ज्ञान Previous Knowledge Multiplication

पाठाच्या पायऱ्या Steps of the Lesson	अध्यापन मुद्दे Teaching Points	उद्दिष्टे व विशिष्टके Objectives with Specification
INTRODUCTION	1] square 2] square root	*] To enable students to know about square and square roots *] To enable students to understand practical applications of square and square roots *] To develop thinking, reasoning and imagination among students
Statement of Aim - Today, we are going to		

दिनांक Date 20/11/23

वर्ग Class VIII th

तासिका अवधी Length of the Period 35 mins

अध्यायनानुभव Learning Experience

अध्यापक कृती Teacher's Activities	छात्र कृती Student's Activities
Teacher asks some introductory questions Q1] How do you calculate area of a square? Q2] What is the square of 10? Q3] What is the square root of 100?	Students give appropriate answers to the asked questions Ans] Area of square is side x side where side means the length of a side. Ans] The square of 10 is 10 x 10 = 100. Ans] 100 can be expressed as product of 10 x 10. So, square root of 100 is 10.
study about square and square roots	

पाठाच्या पायऱ्या (Steps of Lesson)	अध्यापन मुद्दे (Teaching Points)	उद्दिष्टे व स्पष्टीकरणे (Objectives with Specification)
PRESENTATION	Square If a natural number m can be expressed as n^2 where n is also a natural number, then m is a square number.	1] Knowledge - students are able to know about square numbers. 2] Understanding - students are able to understand how squares are calculated. 3] Application - students are able to apply calculation of squares to real life situations.

Number	Square
1	1
2	4
3	9
4	16
5	25
6	36
7	49
8	64
9	81
10	100
11	121
12	144
13	169
14	196
15	225

अध्ययनानुभव (Learning Experience)	
शिक्षक कृती (Teacher Activity)	विद्यार्थी कृती (Student Activity)
Teachers ask some questions related to the topic.	Students give appropriate answers to the asked questions.
Q1 What is a square of a number?	Ans A square is a number that is obtained by multiplying a number by itself.
Q2 Give some examples of squares.	Ans The squares of 1, 2 and 3 are 1, 4 and 9 respectively.
Q3 What are triangular numbers?	Ans Triangular numbers are the numbers whose dot patterns can be arranged as triangles.
Q4 Find the square of 23 without actual multiplication.	Ans $23 = 20 + 3$ $23^2 = (20+3)^2$ $= 20^2 + 2 \times 20 \times 3 + 3^2$ $= 400 + 120 + 9$ $= 529$ ∴ Square of 23 is 529.

पाठाच्या पायऱ्या (Steps of Lesson)	अध्यापन मुद्दे (Teaching Points)	उद्दिष्टे व स्पष्टीकरणे (Objectives with Specification)
	Square Roots - Square root is an inverse operation of square. Positive square root of a number is denoted by the symbol $\sqrt{}$.	1] knowledge - students are able to know about square roots.

Number	square root
1	$\sqrt{1} = 1$
4	$\sqrt{4} = 2$
9	$\sqrt{9} = 3$
16	$\sqrt{16} = 4$
25	$\sqrt{25} = 5$
36	$\sqrt{36} = 6$
49	$\sqrt{49} = 7$
64	$\sqrt{64} = 8$
81	$\sqrt{81} = 9$
100	$\sqrt{100} = 10$
121	$\sqrt{121} = 11$
144	$\sqrt{144} = 12$
169	$\sqrt{169} = 13$

2] Understanding students are able to understand to calculate square roots

3] Application students are able to apply the learned concept in real life situations.

अध्ययनानुभव (Learning Experience)

शिक्षक कृती (Teacher Activity)	विद्यार्थी कृती (Student Activity)
Teachers ask some questions related to the topic	Students give appropriate answers to the asked questions.
Q1] What is a square root?	Ans] A square root is the inverse operation of squaring. It is the number that when multiplied by it self gives the original number
Q2] Give some examples of square roots.	Ans] Some common examples of square roots are $\sqrt{1}=1$, $\sqrt{4}=2$; $\sqrt{9}=3$ and $\sqrt{16}=4$
Q3] Find the least number that must be subtracted from 5607 to get a perfect square	Ans] 74^2 is less than 5607 by 131. So, $5607-131=5476$ $\sqrt{5476}=74$ $\therefore$ 131 should be subtracted
Q4] Find the square root of by prime factorisation.	Ans] 2 | 64 ; 2 | 32 ; 2 | 16 ; 2 | 8 ; 2 | 4 ; 2 | 2 ; | 1 $64=2\times2\times2\times2\times2\times2$ $\sqrt{64}=2\times2\times2=8$ $\therefore$ 8 is the square root of 64.

पाठाच्या पायऱ्या (Steps of Lesson)	अध्यापन मुद्दे (Teaching Points)	उद्दिष्टे व स्पष्टीकरणे (Objectives with Specification)
RECAPITULATION	1] Square 2] Square roots 3] Triangular numbers 4] Pythagorean triplet 5] Prime factorisation 6] Applications of square and square roots	*] To revise the topic taught in the class *] To evaluate the knowledge gained by students *] To test the concept understood by the students regarding square and square roots

अध्ययनानुभव (Learning Experience)	
शिक्षक कृती (Teacher Activity)	विद्यार्थी कृती (Student Activity)
Teachers ask some questions related to the topic.	Students give appropriate answers to the asked questions.
Q.1] What are practical applications of squares?	Ans] The practical applications of squares are measuring area and calculating distances.
Q.2] What are the practical applications of square roots?	Ans] The practical applications of square roots are calculating side lengths of squares and finding distances.
Q.3] Square numbers end with which digits?	Ans] All square numbers can only have 0, 1, 4, 5, 6, 9 at its unit places.
Q.4] What is a pythagorean triplet?	Ans] For any natural number m, if $(2m)^2 + (m^2-1)^2 = (m^2+1)^2$ so, $2m$, m^2-1 and $m+1$ forms a pythagorean triplet. for ex - 6, 8 and 10 is a pythagorean triplet.

पाठाच्या पायऱ्या Steps of the Lesson	अध्यापन मुद्दे Teaching Points	उद्दिष्टे व विशिष्टके Objectives with Specification
HOMEWORK		*] To utilize the free time. *] To create interest in the topic taught. *] To understand the taught concept properly.

फलक सार
Black Board Summary

Day - Tuesday
Date - 31/10/23

Class - IX
Sub - Mathematics
Topic - Square and square root

on roll -
Present -
Absent -

Squares

1	1
2	4
3	9
4	16

5	25
6	36
7	49
8	64

2	100
2	50
5	25
5	5
	1

$\sqrt{100} = 2 \times 5 = 10$

$100 = 2 \times 2 \times 5 \times 5$

Homework - Area of a square plot is 2304 m^2. Find the side of square plot.

अध्ययनानुभव (Learning Experience)

शिक्षक कृती (Teacher Activity)	विद्यार्थी कृती (Student Activity)
Teacher gives homework on blackboard Homework- Area of a square plot is 2304 m^2. Find the side of square plot. What will be the unit digit of the squares of the following numbers i) 272 ii) 799	Students write it down and solve it in their notebook

अभिप्राय (Remarks)

पर्यवेक्षकाची सही
(Sign. of Supervisor)

पाठांक S.No. 15

विषय Subject Mathematics

शाळा School V.L. Convent

विषयांश Topic Cube and cube

पाठ साहित्य Material Aids Chalk, Blackboard, Duster

पूर्व ज्ञान Previous Knowledge Multiplication

पाठाच्या पायऱ्या Steps of the Lesson	अध्यापन मुद्दे Teaching Points	उद्दिष्टे व विशिष्टके Objectives with Specification
INTRODUCTION	1] Cube 2] Cube Roots	*] To develop twinking, reasoning and imagination among students *] To enable students to understand the concept of cube and cube roots *] To enable students to know about applications of cube and cube roots
Statement of Aim- Today, we		are going to

दिनांक Date 22/11/23

वर्ग Class VIII th

Roots

Tables

तालिका अवधी Length of the Period 35 mins

अध्यायनानुभव Learning Experience

अध्यापक कृती Teacher's Activities	छात्र कृती Student's Activities
Teacher asks some introductory questions	students give appropriate answers to the asked questions.
Q1] What is volume of a cube of side a unit?	Ans] Volume of a cube is a^3 unit^3. or cu units.
Q2] What is the cube of 4^2.	Ans] The cube of 4 is $4 \times 4 \times 4 = 64$
Q3] What is the cube root of 64?	Ans] The cube root of 64 is $4^3 = 64$ ie. 4.
Study about cube and	cube roots

पाठाच्या पायऱ्या (Steps of Lesson)	अध्यापन मुद्दे (Teaching Points)	उद्दिष्टे व स्पष्टीकरणे (Objectives with Specification)
PRESENTATION	Cubes A perfect cube or cube number is obtained when a number is multiplied by taking it three times.	1] Knowledge students are able to know about cubes of the numbers

Number	Cube
1	1
2	8
3	27
4	64
5	125
6	216
7	343
8	512
9	729
10	1000
11	1331
12	1728
13	2179
14	2744

2] Understanding
students are able to understand how cubes of numbers are calculated.

3] Application
students are able to apply knowledge of cubes to solve problems in real life situations.

अध्ययनानुभव (Learning Experience)	
शिक्षक कृती (Teacher Activity)	विद्यार्थी कृती (Student Activity)
Teachers ask some questions related to the topic.	Students give appropriate answers to the asked questions
I] What is cube of a number ?	Ans] The cube of a number is the number raised to the power of three.
II] Give an example of cube of a number?	Ans] The cube of 2 is $2 \times 2 \times 2 = 8$
III] What are the cubes of odd numbers and cubes of negative numbers ?	Ans] The cubes of odd numbers is odd and cubes of negative numbers is negative
IV] Find the cubes of a] 3 b] 5 c] -2	Ans] The cubes of given numbers are a] $3^3 = 3 \times 3 \times 3 = 27$ b] $5^3 = 5 \times 5 \times 5 = 125$ c] $(-2)^3 = -2 \times -2 \times -2 = -8$

पाठाच्या पायऱ्या (Steps of Lesson)	अध्यापन मुद्दे (Teaching Points)	उद्दिष्टे व स्पष्टीकरणे (Objectives with Specification)

Cube Roots

Cube root is the inverse operation of finding cube. The symbol $\sqrt[3]{}$ denotes cube root

Numbers	Cube Roots
1	$\sqrt[3]{1} = 1$
8	$\sqrt[3]{8} = 2$
27	$\sqrt[3]{27} = 3$
64	$\sqrt[3]{64} = 4$
125	$\sqrt[3]{125} = 5$
216	$\sqrt[3]{216} = 6$
343	$\sqrt[3]{343} = 7$
512	$\sqrt[3]{512} = 8$
729	$\sqrt[3]{729} = 9$
1000	$\sqrt[3]{1000} = 10$

1] Knowledge
Students are able to know about cube roots of the numbers.

2] Understanding
Students are able to understand how cube roots of numbers are calculated.

3] Application
Students are able to apply knowledge of cube roots to solve problems in daily life situations.

अध्ययनानुभव (Learning Experience)	
शिक्षक कृती (Teacher Activity)	विद्यार्थी कृती (Student Activity)
Teacher asks some questions related to the topic	Students give appropriate answers to the asked questions.
Q1] What is cube root of a number?	Ans] The cube root of a number is the number that when cubed gives the original numbe
Q2] Give an example of cube root.	Ans] The cube root of 8 is 2 because $2 \times 2 \times 2 = 8$
Q3] Which is the method to find cube root of a number?	Ans] The cube root of a number can be found out by factorization and method of esHmation.
Q4] Find the cube root of 125 by prime factorisation	Ans] $5 \mid 125$ $5 \mid 25$ $5 \mid 5$ 1 $125 = 5 \times 5 \times 5$ $\sqrt[3]{125} = 5$ 5 is the cube root of 125

पाठाच्या पायऱ्या (Steps of Lesson)	अध्यापन मुद्दे (Teaching Points)	उद्दिष्टे व स्पष्टीकरणे (Objectives with Specification)
RECAPITULATION	1] cubes 2] cube roots 3] Factorisation 4] Estimation	*] To revise the topic taught in the class. *] To evaluate the knowledge gained by students *] To test the concepts understood by the students regarding cube and cube roots

अध्ययनानुभव (Learning Experience)

शिक्षक कृती (Teacher Activity)	विद्यार्थी कृती (Student Activity)
Teachers ask some questions related to the topic	Students give appropriate answers to the asked questions.
Q1] What is the real life application of cube?	Ans] Cutting a vegetable into square sided shapes or in the shape of dice.
Q2] What is a cube?	Ans] In terms of geometry, a cube is a three-dimensional square cut from something.
Q3] What is the real life application of cube roots?	Ans] Cube roots are used in carpentry, engineering, designing buildings, flooring and technology.
Q4] Is 243 a perfect cube?	Ans] $243 = \underline{3\times3\times3}\times3\times3$ In the above factorisation 3×3 remains ungrouped in the triplets. ∴ 243 is not a perfect cube.

पाठाच्या पायऱ्या Steps of the Lesson	अध्यापन मुद्दे Teaching Points	उद्दिष्टे व विशिष्टके Objectives with Specification
HOMEWORK		*] To utilize the free time *] To create interest in the topic taught *] To understand the taught concept properly

फलक सार

Black Board Summary

Day - Wednesday
Date - 22/11/23

Class - IX
Sub - Mathematics
Topic - Cube and cube roots

an roll -
Present -
Absent -

1	1
2	8
3	27
4	64
5	125

6	216
7	343
8	512
9	729
10	1000

$\sqrt[3]{1000} = 10$

2	1000
2	500
2	250
5	125
5	25
5	5
	1

Homework - Ketaki makes a cuboid of sides 5 cm, 2 cm, 5 cm. How many such cuboids will she need to form a cube?

अध्ययनानुभव (Learning Experience)	
शिक्षक कृती (Teacher Activity)	विद्यार्थी कृती (Student Activity)
The teacher gives homework written on blackboard Homework - 1] Ketaki makes a cuboid of sides 5cm, 2cm, 5cm. How many such cuboids will she need to form a cube? 2] Which of the following are perfect cubes? i] 400 ii] 9000	Students write it down and solve it in their notebooks.

अभिप्राय (Remarks)

पर्यवेक्षकांची सही
(Sign. of Supervisor)

पाठांक S.No 16

विषय Subject Mathematics

शाळा School V.L. convent

विषयांश Topic Direct and Inverse

पाठ साहित्य Material Aids Chalk, Blackboard, Duster

पूर्व ज्ञान Previous Knowledge Multiplication, Di

पाठाच्या पायऱ्या Steps of the Lesson	अध्यापन मुद्दे Teaching Points	उद्दिष्टे व विशिष्टके Objectives with Specification
INTRODUCTION	1] Direct Proportions.	*] To develop thinking, reasoning and imagination among students.
	2] Inverse Proportions	*] To enable students to understand direct and inverse propor *] To enable students to know about practical applications of proportions.
statement of Aim - Today, we are going to		

दिनांक Date 24/11/23

वर्ग Class VIII th

तासिका अवधी Length of the Period 35 mins

अध्ययनानुभव Learning Experience

अध्यापक कृती Teacher's Activities	छात्र कृती Student's Activities
Teacher asks some introductory questions	Students give appropriate answers to the asked questions
Q1] If you park your car at a parking where parking charges are ₹60 per hour. How much will you pay for two hours?	Ans] The charges of parking are ₹ 60 for one hour so, for two hours, charges will be 60 × 2 = ₹120
Q2] If you buy a pen, how can you explain the costing?	Ans] If we buy more pens, we need more money.
Q3] How can you explain number of workers and number of days?	Ans] The more number of workers will require less number of days to complete the work
Study about Direct and	Inverse Proportions.

पाठाच्या पायऱ्या (Steps of Lesson)	अध्यापन मुद्दे (Teaching Points)	उद्दिष्टे व स्पष्टीकरणे (Objectives with Specification)
PRESENTATION	**Direct Proportion** When the relationship between two quantities is such that if we increase one, the other will also increase and if we decrease one, the other quantity will also decrease. **Example** - The number of food items bought is directly proportional to the total money spent. **Formula** If $y \propto x$ $y = kx$ for a constant k	1] **Knowledge** - Students are able to know about direct proportion 2] **Understanding** students are able to understand how direct proportions are calculated 3] **Application** students are able to apply formulas of direct proportion to various examples.

अध्ययनानुभव (Learning Experience)	
शिक्षक कृती (Teacher Activity)	विद्यार्थी कृती (Student Activity)
Teacher asks some questions about the topic.	Students give appropriate answers to the asked questions
Q.1] Explain direct proportion in terms of x and y.	Ans] In direct proportion, y increases as x increases and y decreases as x decreases.
Q.2] If a man earns ₹ 805 per week, how much will he earn in 16 days.	Ans] 1 week = 7 days Income per day = $\frac{805}{7}$ = ₹ 115 ∴ Income in 16 days = 115 × 16 = ₹ 1840
Q.3] If two cardboard boxes occupy 500 cm^3 of space, then find the space occupied by one cardboard box?	Ans] 2 boxes occupy 500 cm^3 of space ∴ Space for one box = 500/2 = 250 cm^3
Q.4] How the graph of direct proportion is denoted?	Ans] The graph of direct proportion is a straight line with an upward slope.

पाठाच्या पायऱ्या (Steps of Lesson)	अध्यापन मुद्दे (Teaching Points)	उद्दिष्टे व स्पष्टीकरणे (Objectives with Specification)
RECAPITULATION	**Inverse Proportions** When two quantities are related to each other inversely i.e. when an increase in one quantity brings a decrease in other and vice versa then they are said to be in inverse proportion. **Example -** More number of workers will complete the given work in less number of days. **Formula** $y \propto \frac{1}{x}$ $y = k \times \frac{1}{x}$ $y = \frac{k}{x}$ for a constant k.	1] Knowledge - students are able to know about inverse proportion. 2] Understanding - students are able to understand how inverse proportions are calculated 3] Application - students are able to apply formulas of inverse proportion to solve various exam

अध्ययनानुभव (Learning Experience)	
शिक्षक कृती (Teacher Activity)	विद्यार्थी कृती (Student Activity)
Teacher asks some questions related to the topic	Students give appropriate answers to the asked questions.
Q1] Explain inverse proportion in terms of x and y.	Ans] In inverse proportion y decreases as x increases and y increases as x decreases.
Q2] Suppose x and y are in inverse proportion If $y = 12$ then $x = 4$. Find the value of y when $x = 8$.	Ans] $x \propto 1/y \Rightarrow x = \frac{k}{y}$ $4 = \frac{k}{12} \Rightarrow k = 48$ also $8 = \frac{48}{y} \Rightarrow y = 48/8$ $y = 6$.
Q3] If 35 men can do a work in 8 days, in how many days can 20 men complete the same work?	Ans] 1 man can do the work in 35×8 days $\therefore$ for 20 men $\frac{35 \times 8}{20}$ $= 14$ days will be required.
Q4] How the graph of Inverse proportion is denoted?	Ans] The graph of inverse proportion is usually a curve that bends towards the origin forming a shape of hyperbola.

पाठाच्या पायऱ्या (Steps of Lesson)	अध्यापन मुद्दे (Teaching Points)	उद्दिष्टे व स्पष्टीकरणे (Objectives with Specification)
	1] Direct proportion - Definition - Example - Formula 2] Inverse proportion - Definition - Example - Formula	*] To revise the topic taught in the class *] To evaluate the knowledge gained by students. *] To test the concept understood by the students regarding direct and inverse proportion

अध्ययनानुभव (Learning Experience)	
शिक्षक कृती (Teacher Activity)	**विद्यार्थी कृती (Student Activity)**
Teacher asks some questions related to the topic.	Students give appropriate answers to the asked questions.
[1] Find the value of x if a and b are in inverse proportion a 12 x b 30 5	Ans] $a = \frac{k}{b} \Rightarrow k = ab$ $k = 12 \times 30 = 360$ $x = \frac{360}{5} = 72$
[2] If P is directly proportional to Q^2, then find a formula for P in terms of Q.	Ans] As P is directly proportional to Q^2. $P \propto Q^2$ $P = kQ^2$ is the formula required.
[3] Give an example of direct proportion.	Ans] The cost of a banana is 70p. As the number of bananas increases, so does the cost increases.
[4] Give an example of inverse proportion.	Ans] It takes 1 worker 9 hours to dig a hole. As the number of workers increases, the number of hours to dig the same hole decreases.

पाठाच्या पायऱ्या Steps of the Lesson	अध्यापन मुद्दे Teaching Points	उद्दिष्टे व विशिष्टके Objectives with Specification
HOMEWORK		*] To revise the topic taught *] To utilize free the time *] To create interest in the topic taught

फलक सार
Black Board Summary

Day - Friday
Date - 24/11/23

Class - IX
Sub - Mathematics
Topic - Direct and Inverse Proportion

On Roll -
Present -
Absent -

Direct proportion	Inverse Proportion
$y \propto x$ $y = kx$ where k is constant	$y \propto 1/x$ $y = k/x$ where k is constant

Homework - An electric pole 14 m casts a shadow of 10 m. Find the height of a tree that casts a shadow of 15 m under same situation

अध्ययनानुभव (Learning Experience)	
शिक्षक कृती (Teacher Activity)	विद्यार्थी कृती (Student Activity)
Teacher gives homework written on the black board. Homework- An electric pole, 14 m high casts a shadow of 10 m. Find the height of a tree that casts a shadow of 15 m under similar situations.	Students write it down and solve in their notebooks.

अभिप्राय (Remarks)

पर्यवेक्षकाची सही
(Sign. of Supervisor)

पाठांक S.No 17

विषय Subject Mathematics

शाळा School V.L. Convent

विषयांश Topic Comparing Qua

पाठ साहित्य Material Aids Chalk, Blackboard, Duster

पूर्व ज्ञान Previous Knowledge Ratios, Percentag

पाठाच्या पायऱ्या Steps of the Lesson	अध्यापन मुद्दे Teaching Points	उद्दिष्टे व विशिष्टके Objectives with Specification
INTRODUCTION		*] To develop thinking, reasoning and imagination among students *] To enable students to understand quantities *] To enable students to know about how different quantities are compared.
statement of Aim - Today,		we are going

दिनांक Date 25/11/23

वर्ग Class VIII th

तासिका अवधी Length of the Period 35 mins

ary method

अध्यायनानुभव Learning Experience

अध्यापक कृती Teacher's Activities	छात्र कृती Student's Activities
Teacher asks some introductory questions Q1] What is the use of ratios? Q2] If in a picnic, 60% of the total number of students are girls. Find the number of girls if total students are 18. Q3] If in a class, there are 18 girls and 12 boys, find the ratio of girls to boys	Students give appropriate answers to the asked questions. Ans] Ratios are very commonly used for comparing two or more quantities. Ans] Let x be 60% of girls $\frac{60}{100} \times x = 18$ $x = \frac{18 \times 100}{60} = 30$ students. Ans] The number of girls is 18 and those of boys is 12. Their ratio is 18/12 3:2 read as 3 is to 2.

→ study about comparing quantities

पाठाच्या पायऱ्या (Steps of Lesson)	अध्यापन मुद्दे (Teaching Points)	उद्दिष्टे व स्पष्टीकरणे (Objectives with Specification)
PRESENTATION	Ratio and Percentages A basket has two types of fruits, say 20 apples and 5 oranges. Then the ratio of number of oranges to apples is 5:20 or 1:4 There are 5 oranges out of 25 fruits % of oranges $= \frac{5}{25} \times 100 = 20\%$ % of oranges = 20% Similarly, % of apples = 80%	1] Knowledge students are able to know about ratio and percentage 2] Understanding students are able to understand how ratios and percentage are calculated 3] Application students are able to apply

अध्ययनानुभव (Learning Experience)	
शिक्षक कृती (Teacher Activity)	विद्यार्थी कृती (Student Activity)
Teacher asks some questions related to the topic.	Students give appropriate answers to the asked questions.
1] Find the ratio of 50 paise to ₹5.	Ans] Since ₹1 = 100 p $\frac{50p}{₹5} = \frac{50}{5\times100} = \frac{50}{500} = \frac{1}{10}$ ∴ The required ratio is 1:10
2] 72% of 25 students are interested in maths. How many are not interested in maths?	Ans] % of students who are not good in maths = 100 − 72 = 28% ∴ number of these students $\frac{28}{100} \times 25 = 7$ ∴ 7 students are not good in maths
3] Find the ratio of 5m to 10km.	Ans] Since 10 km = 10000 m $\therefore \frac{5}{10000} = \frac{1}{2000}$ ∴ The required ratio is 1:2000
4] Convert the ratio 3:4 to percentage.	Ans] $\frac{3}{4} \times 100$ $= 3 \times 25 = 75\%$ ∴ The required percentage is 75%

पाठाच्या पायऱ्या (Steps of Lesson)	अध्यापन मुद्दे (Teaching Points)	उद्दिष्टे व स्पष्टीकरणे (Objectives with Specification)
	Discount : Discount is the reduction given on the marked price (MP) of the article. **Discount = MP − SP** **Profit** SP − CP = Profit **% Profit = $\frac{\text{Profit}}{CP} \times 100$** **Loss** Loss = CP − SP **% loss = $\frac{\text{loss}}{CP} \times 100$**	1] Knowledge Students are able to know about discount, profit and loss values 2] Understanding Students are able to understand about calculation of discount, profit and loss 3) Application students are able to apply formulas of profit and in real life examples

अध्ययनानुभव (Learning Experience)

शिक्षक कृती (Teacher Activity)	विद्यार्थी कृती (Student Activity)
Teacher asks some questions related to the topic	Students give appropriate answers to the asked questions
Q1] An item marked at ₹ 840 is sold for ₹ 714. What is the discount and % discount?	Ans] Discount = MP − SP = 840 − 714 = ₹ 126 ∴ % discount = $\frac{126}{840} \times 100$ = 15%
Q2] Your bill in a shop is ₹ 580 and the shopkeeper gives 15% discount. What is the amount to be paid?	Ans] 15% of 580 = $\frac{15}{100} \times 580$ = ₹ 87 ∴ 580 − 87 = ₹ 493 ∴ ₹ 493 is the bill to be paid
Q3] By selling 100 books, a shopkeeper gains the SP of 20 books. What is his gain percentage?	Ans] Let SP of one book be ₹1 and SP of 100 books be ₹100 gain = SP of 20 books = ₹20 CP = SP − gain = 100 − 20 = ₹80 gain % = $\frac{20}{80} \times 100 = 25\%$
Q4] What is overhead expense?	Ans] Additional expenses on transportation, rent, repair are included in the original CP. CP = original price + overhead expenses.

पाठाच्या पायऱ्या (Steps of Lesson)	अध्यापन मुद्दे (Teaching Points)	उद्दिष्टे व स्पष्टीकरणे (Objectives with Specification)
RECAPITULATION	1] Ratio and percentages 2] Discount 3] Profit 4] Loss	*] To revise the topic taught in the class *] To evaluate the knowledge gained by students. *] To test the concept understood by the students regarding comparing quantities

अध्ययनानुभव (Learning Experience)	
शिक्षक कृती (Teacher Activity)	विद्यार्थी कृती (Student Activity)
Teacher asks some questions related to the topic.	Students give appropriate answers to the asked questions.
[1] Find the ratio of speed of cycle 15 kmph to the speed of a scooter 30 kmph.	Ans] Ratio of speed of cycle to the speed of scooter $= \frac{15}{30} = \frac{1}{2} = 1:2$ ∴ The required ratio is 1:2
[2] If the marked price of a book is ₹ 50 and ₹ 10 discount is given what is % discount?	Ans] Discount % $= \frac{10}{50} \times 100$ $= 20\%$ ∴ Percentage discount is 20%
[3] If CP of a fridge is ₹ 10,500 and SP is ₹ 11,500, then find the profit.	Ans] CP = ₹ 10,500 SP = ₹ 11,500 Profit = 11500 − 10500 = ₹ 1000 ∴ The required profit is ₹ 1000
[4] A student bought a bag for ₹ 350 and sold it for ₹ 400. Find the profit %.	Ans] CP = ₹ 350 SP = ₹ 400 profit = 400 − 350 = ₹ 50 % profit $= \frac{50}{350} \times 100$ $= 14.28\%$ ∴ The percentage profit is 14.28%

पाठाच्या पायऱ्या Steps of the Lesson	अध्यापन मुद्दे Teaching Points	उद्दिष्टे व विशिष्टके Objectives with Specification
HOMEWORK		*] To revise the topic taught *] To utilize the free time *] To create interest in the topic taught

फलक सार

Black Board Summary

Date- 25/11/23 Class- IX on roll- present- absent-

Day- Friday Sub- Mathematics

Topic- Comparing quantities

Discount = MP - SP

MP -- marked price

SP --- selling price

CP --- cost price

% profit = $\frac{\text{Profit}}{\text{CP}} \times 100$

% loss = $\frac{\text{loss}}{\text{CP}} \times 100$

Homework - 1] Convert the ratio 2:3 to %

2] A shopkeeper bought two TV sets at ₹ [illegible] each. He sold one at a profit of 10% and [illegible] at a loss of 10%. Find overall profit or loss

अध्ययनानुभव (Learning Experience)

शिक्षक कृती (Teacher Activity)	विद्यार्थी कृती (Student Activity)
gives homework on the blackboard Homework- Convert the ratio 2:3 to percentage. A shopkeeper bought TV sets at ₹10000 each. He sold one at a profit 10% and other at a loss of 10%. Find overall profit or loss.	Students write it down and solve it in their notebooks

अभिप्राय (Remarks)

पर्यवेक्षकाची सही
(Sign. of Supervisor)

पाठांक S.No. 18

विषय Subject Mathematics

शाला School V.L.convent

विषयांश Topic Linear Equation

पाठ साहित्य Material Aids Chalk, Duster, Blackboard

पूर्व ज्ञान Previous Knowledge Equalities, expr

पाठाच्या पायऱ्या Steps of the Lesson	अध्यापन मुद्दे Teaching Points	उद्दिष्टे व विशिष्टके Objectives with Specification
INTRODUCTION	1] Linear equation in one variable 2] Solution of linear equation in one variable	*] To develop thinking, reason and imagin among students *] To enable student to understand variables and their use *] To enable student to know about linear equa in one vari
Statement of Aim - Today, we		are going to

दिनांक Date 21/12/23

variable

वर्ग Class VIII th

variables

तासिका अवधी Length of the Period 35 mins

अध्यायनानुभव Learning Experience

अध्यापक कृती Teacher's Activities	छात्र कृती Student's Activities
Teachers ask some introductory questions	Students give appropriate answers to the asked questions.
Q1] Let the cost of a pen be ₹x. Cost of a book is equal to two pens. How will you form equation?	Ans] cost of one pen = ₹x Cost of a book = 2 × cost of pen = 2 × x = 2x
Q2] Age of mother is two times her child. How will you form equation?	Ans] Let age of the child = y years Age of mother = 2 × age of child = 2y
Q3] I have some candies. I gave you two candies. Represent this in the equation.	Ans] Let I have x candies ∴ The equation for this relationship is x − 2

Study about Linear Equation in one variable.

पाठाच्या पायऱ्या (Steps of Lesson)	अध्यापन मुद्दे (Teaching Points)	उद्दिष्टे व स्पष्टीकरणे (Objectives with Specification)
P R E S E N T A T I O N	**Linear Equation in one variable** An equation which is expressed in the form of $ax+b=0$ where, a and b are two integers and x is a variable. It has only one solution. **Examples-** 1] $3x=1$ 2] $22x-1=0$ 3] $4x+9=0$ **standard form-** $ax+b=0$	1] **Knowledge** students are able to know about parts of linear equation and its standard form 2] **Understanding** students are able to understand how equations are formed 3] **Application** students are able to apply knowledge to solve in real situations

अध्ययनानुभव (Learning Experience)	
शिक्षक कृती (Teacher Activity)	विद्यार्थी कृती (Student Activity)
Teacher asks some questions related to the topic.	Students give appropriate answers to the asked questions.
Q.1 How many solutions does a linear equation in one variable have?	Ans] Every linear equation in one variable has one and unique solution.
Q.2 What is the formula of linear equation in one variable?	Ans] The formula of the standard form of an equation having only one variable is given as $ax + b = 0$.
Q.3 Form a linear equation sum of two numbers is 95. If one exceeds the other by 15.	Ans] Let one number be x. Then the other number becomes $x + 15$. According to the question, $x + x + 15 = 95$ $2x + 15 = 95$
Q.4 Three consecutive integers add up to 51. What are these integers?	Ans] Let consecutive integers be x, $x+1$, $x+2$. According to the question, $x + x + 1 + x + 2 = 51$ $3x + 3 = 51$ $3x = 51 - 3$ $3x = 48$ $x = 16$ 16, 17, 18 are the numbers

पाठाच्या पायऱ्या (Steps of Lesson)	अध्यापन मुद्दे (Teaching Points)	उद्दिष्टे व स्पष्टीकरणे (Objectives with Specification)
	Solving Linear Equation in one variable For solving an equation in one variable, following steps are followed. 1] Using LCM, clear the fractions if any 2] Simplify both sides of the equation 3] Isolate the variable 4] Verify your answer Ex → $5x - 9 = -3x + 19$ $5x + 3x = 19 + 9$ $8x = 28$ $x = 28/8$ $x = 14/4$ $\boxed{x = 7/2}$	1] Knowledge Students are able to know how linear equations in one variable are solved. 2] Understanding Students are able to understand solutions of linear equation in one variable. 3] Application Students are able to apply knowledge to solve problems in real life examples.

अध्ययनानुभव (Learning Experience)	
शिक्षक कृती (Teacher Activity)	विद्यार्थी कृती (Student Activity)
Teacher asks some questions related to the topic	Students give appropriate answers to the asked questions
Solve : $2x - 4 = 0$	Ans] $2x - 4 = 0$ $2x = 4$ $x = 4/2$ $\boxed{x = 2}$
Solve : $\frac{x}{5} = 10$	Ans] $\frac{x}{5} = 10$ $x = 10 \times 5$ $\boxed{x = 50}$
Solve $\frac{5x}{3} + \frac{2}{5} = 1$ $15 \times \frac{5x}{3} + 15 \times \frac{2}{5} = 15$ $25x + 6 = 15$	Ans] LCM of 3 and 5 is 15 $25x + 6 = 15$ $25x = 15 - 6$ $25x = 9$ $\boxed{x = \frac{9}{25}}$
What are applications of Linear equations in real life?	Ans] 1] Finding unknown age 2] Finding unknown angles in geometry 3] For calculation of speed, distance or time 4] Solving problems based on force and pressure

पाठाच्या पायऱ्या (Steps of Lesson)	अध्यापन मुद्दे (Teaching Points)	उद्दिष्टे व स्पष्टीकरणे (Objectives with Specification)
RECAPITULATION	1] Linear equation in one variable 2] Examples 3] Standard Form 4] Solving Linear Equation in one variable 5] Steps of solving linear equation in one variable	*] To revise the topic taught in the class. *] To evaluate the knowledge gained by the students *] To test the concept understood by the students regarding linear equation in one variable

अध्ययनानुभव (Learning Experience)	
शिक्षक कृती (Teacher Activity)	विद्यार्थी कृती (Student Activity)
Teacher asks some questions related to the topic	Students give appropriate answers to the asked questions.
Q1] What is a linear equation?	Ans] A linear equation is an algebraic equation in which each term is either a constant or the product of constant and a variable $ax+b=0$
Q2] What is a linear equation with one variable?	Ans] A linear equation with one variable and degree one is called a linear equation in one variable. $ex - 3x + 5 = 0$
Q3] solve $12m - 10 = 6$	Ans] $12m - 10 = 6$ $12m = 6 + 10$ $12m = 16$ $m = \frac{16}{12}$ $\boxed{m = 4/3}$
Q4] Fifteen years from now Ravi's age will be four times his present age. What is Ravi's present age?	Ans] let x be Ravi's present age $x + 15 = 4x$ $15 = 4x - x$ $15 = 3x$ $x = 15/3$ $x = 5$ ∴ present age of Ravi is 5 years

पाठाच्या पायऱ्या Steps of the Lesson	अध्यापन मुद्दे Teaching Points	उद्दिष्टे व विशिष्टके Objectives with Specification
HOMEWORK		*] To utilize the free time *] To create interest in the topic taught. *] To understand the taught concept properly.

फलक सार
Black Board Summary

Day - Thursday
Date - 21/12/23

Class - IX
Sub - Mathematics
Topic - Linear Equations in one variable

on roll -
Present -
absent -

Linear Equation in one variable

$6x = 12$

$x = \frac{12}{6}$

$\boxed{x = 2}$

$10x = 100$

$x = \frac{100}{10}$

$\boxed{x = 10}$

Homework - 1] Three consecutive integers are such that when they are taken in increasing order and multiplied by 2, 3, 4 respectively add up to 74. Find these numbers.

अध्ययनानुभव (Learning Experience)	
शिक्षक कृती (Teacher Activity)	विद्यार्थी कृती (Student Activity)
Teacher gives homework written on blackboard Homework - 1] Three consecutive integers are such that when they are taken in increasing order and multiplied by 2, 3 and 4 respectively, they add up to 74. Find these numbers.	Students write it down and solve it in their notebooks

अभिप्राय (Remarks)

पर्यवेक्षकाची सही
(Sign. of Supervisor)

पाठांक S.No 19 | विषय Subject Mathematics

शाला School V.L. Convent | विषयांश Topic Linear equation

पाठ साहित्य Material Aids Chalk, Blackboard Duster | पूर्व ज्ञान Previous Knowledge Equalities, expre

पाठाच्या पायऱ्या Steps of the Lesson	अध्यापन मुद्दे Teaching Points	उद्दिष्टे व विशिष्टके Objectives with Specification
INTRODUCTION		*] To develop thinking, reasoning and imagination among students *] To enable students to understand linear equations in two variables *] To enable students to know about linear equation in two variables
Statement of Aim - Today we are going		

दिनांक Date 22/12/23

वर्ग Class IX th

तासिका अवधी Length of the Period 35 mins

अध्यायनानुभव Learning Experience

अध्यापक कृती Teacher's Activities	छात्र कृती Student's Activities
Teacher asks some introductory questions [1] Let the cost of pen be x cost of a book be ₹y. Cost of a book is equal to two pens. Denote with an equation. [2] Age of mother is two times of her child. How will you form equation 2 [3] I am thirty years old. You are x years younger than me. Denote the relationship of variables.	Students give appropriate answers to the asked questions Ans] cost of one pen = ₹x cost of a book = ₹y ∴ Equation $y = 2x \Rightarrow 2x - y = 0$ Ans] Let age of child = x years Age of mother = y years Equation = $y = 2x \Rightarrow 2x - y = 0$ Ans] Age of our teacher = 30 years we are x years younger Relationship in equation is $30 - x$

To study Linear Equation in Two variables

पाठाच्या पायऱ्या (Steps of Lesson)	अध्यापन मुद्दे (Teaching Points)	उद्दिष्टे व स्पष्टीकरणे (Objectives with Specification)
PRESENTATION	**Linear Equations in Two variables** An equation is said to be linear equation in two variables if it is written in the form of $ax+by+c=0$ where a, b, c are real numbers and the coefficients of x and y i.e a and b respectively are not equal to zero **Examples** 1] $3x-6y=-13$ 2] $2x+5y=20$ 3] $3x+6y=12$ **Standard Form** $\boxed{ax+by+c=0}$	1] Knowledge - students are able to know about linear equations in two variables 2] Understanding students are able to understand how linear equations in two variables are derived and 3] Application students are able to apply knowledge to solve linear equations in practical que

अध्ययनानुभव (Learning Experience)	
शिक्षक कृती (Teacher Activity)	विद्यार्थी कृती (Student Activity)
Teachers ask some questions related to the topic.	students give appropriate answers to the asked questions.
Q.1] What are the coefficients of the equation $3x-6y=-13$?	Ans] The coefficient of x is 3 and the coefficient of y is -6.
Q.2] What is the constant of the equation $3x-6y=-13$?	Ans] The constant of the equation $3x-6y=-13$ is -13.
Q.3] How to solve linear equation in two variables?	Ans] For a system of linear equations in two variables, we can find the solutions by the elimination method.
Q.4] How many solutions are there for linear equations in two variables?	Ans] For linear equation in two variables, there are infinitely many solutions.

पाठाच्या पायऱ्या (Steps of Lesson)	अध्यापन मुद्दे (Teaching Points)	उद्दिष्टे व स्पष्टीकरणे (Objectives with Specification)
	Solving linear Equations in Two variables consider example $5x + 3y = 30$ let value of $y = 0$ then, $5x + 3(0) = 30$ $5x = 30$ $x = 30/5$ $x = 6$ solution is $(6, 0)$ let value of $x = 0$ then, $5(0) + 3y = 30$ $3y = 30$ $y = 30/3$ $y = 10$ solution is $(0, 10)$	1] Knowledge students are able to know about solutions of linear equations in two variables. 2] Understanding students are able to understand how to solve linear equations in two variables. 3] Application students are able to apply knowledge to solve problems in real life.

अध्ययनानुभव (Learning Experience)	
शिक्षक कृती (Teacher Activity)	**विद्यार्थी कृती (Student Activity)**
Teachers ask some questions related to the topic.	students give appropriate answers to the asked questions.
E.1] Write the following equation in the form of $ax+by+c=0$	Ans] $2x+3y=4.37$ where $a=2;\ b=3;\ c=4.37$ $2x+3y-4.37=0$
E.2] write the following equation as an equation in two variables. $x=-5$	Ans] $x=-5$ can be written as $1\times x+0\times y=-5$ $x+0y=-5$
E.3] The cost of a book is twice the cost of a pen. Write a linear equation in two variables to represent this.	Ans] let cost of notebook $=₹x$ cost of pen $=₹y$ $\therefore$ linear equation in two variables will be $x=2y;\ x-2y=0$
E.4] Find solution of the equation $4x+3y=12$	Ans] $4x+3y=12$ taking $x=0$, we get $3y=12$ $y=4$ $\therefore (0,4)$ is the solution of the given equation

पाठाच्या पायऱ्या Steps of the Lesson	अध्यापन मुद्दे Teaching Points	उद्दिष्टे व विशिष्टके Objectives with Specification
HOMEWORK		*] To utilize the free time *] To create interest in the topic taught *] To understand the taught concept properly.

फलक सार

Black Board Summary

Date - 22/12/23 Class - IX On roll -
Day - Friday Sub - Mathematics Present -
Topic - Linear Equations absent -
in two variables

Standard form of linear equation in two variables is $ax + by + c = 0$	where, x and y are variables

Homework - If (2,0) is a solution of the linear equation $2x + 3y = k$, then find the value of k.

अध्ययनानुभव (Learning Experience)	
शिक्षक कृती (Teacher Activity)	विद्यार्थी कृती (Student Activity)
Teacher gives homework then on blackboard Homework- If (2,0) is a solution of the linear equation $2x+3y=k$, then find the value of k.	Students write it down and solve it in their notebooks

अभिप्राय (Remarks)

पर्यवेक्षकाची सही
(Sign. of Supervisor)

पाठांक S.No 20

विषय Subject Mathematics

शाळा School V.L Convent

विषयांश Topic Statistics

पाठ साहित्य Material Aids chalk, blackboard, duster, chart showing statistics

पूर्व ज्ञान Previous Knowledge Tally Marks, Fre

पाठाच्या पायऱ्या Steps of the Lesson	अध्यापन मुद्दे Teaching Points	उद्दिष्टे व विशिष्टके Objectives with Specification
INTRODUCTION		*] To develop, thinking, reasoning and imagination among students. *] To enable students to understand statistics. *] To enable students to know about bar graph, histogram and frequency polyg
Statement of Aim - Today we are going to		

दिनांक Date 23/12/23

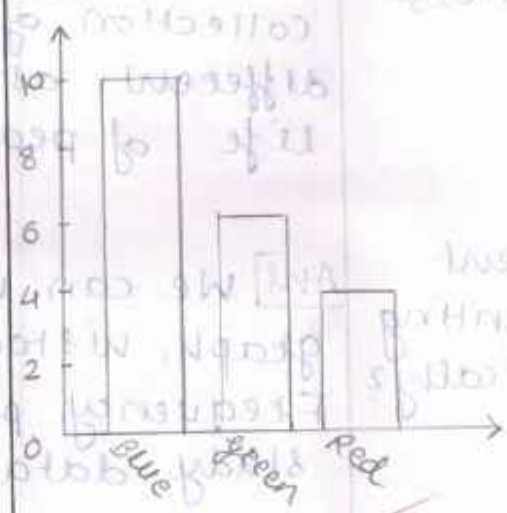
वर्ग Class IX th

requency, Bar graph

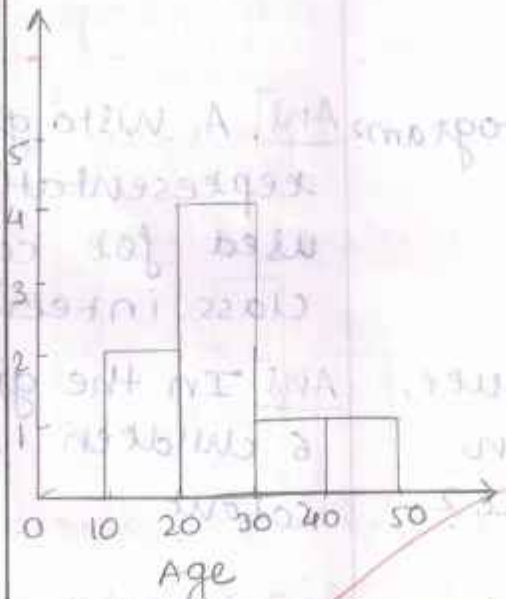
तासिका अवधी Length of the Period 35 min

अध्यायनानुभव Learning Experience

अध्यापक कृती Teacher's Activities	छात्र कृती Student's Activities
Teacher asks some introductory questions 1] What is meaning of the word 'statistics'?	Students give appropriate answers to the asked questions. Ans] Statistics is the collection of data on different aspects of the life of people.
2] what are different methods of representing the data geometrically?	Ans] We can use bar graph, histogram and Frequency polygon to study data.
3] what is a pie chart?	Ans] A pie chart is the pictorial representation of data inside a circle
study about statistics.	

पाठाच्या पायऱ्या (Steps of Lesson)	अध्यापन मुद्दे (Teaching Points)	उद्दिष्टे व स्पष्टीकरणे (Objectives with Specification)
PRESENTATION	Bar graph A bar graph is a chart or graph that presents data with rectangular bars with heights or lengths proportional to the values that they represent.  The following graph represents no. of children and their favourite colour	1] Knowledge Students are able to know about bar graphs. 2] Understanding Students are able to understand how bar graphs are drawn 3] Application Students are able to apply knowledge of statics to solve questions related to bar graph

अध्ययनानुभव (Learning Experience)	
शिक्षक कृती (Teacher Activity)	विद्यार्थी कृती (Student Activity)
Teachers ask some questions related to the topic	students give appropriate answers to the asked questions
1] What is a bar graph?	Ans] A bar graph is a pictorial representation of data in which usually bars of uniform width are drawn.
2] What is a Histogram?	Ans] A histogram is a representation of data used for continuous class intervals.
3] In the given figure, how many children like green colour?	Ans] In the given bar graph 6 children like green colour.
4] What is statistics?	Ans] Statistics deal with the study of collection, presentation and analysis of numerical data.

पाठाच्या पायऱ्या (Steps of Lesson)	अध्यापन मुद्दे (Teaching Points)	उद्दिष्टे व स्पष्टीकरणे (Objectives with Specification)
	Histogram A histogram is a bar graph like representation of data that gives a range of classes into columns along the x-axis  x-axis represents age and y-axis represents frequency	1] knowledge students are able to know about bar graph and histogram. 2] understanding students are able to understand how histograms are drawn. 3] Application students are able to apply knowledge of statics to solve questions related to histogram.

अध्ययनानुभव (Learning Experience)	
शिक्षक कृती (Teacher Activity)	विद्यार्थी कृती (Student Activity)
Teachers ask some questions related to the topic.	Students give appropriate answers to the asked questions.
1] What is mode of data?	Ans] The value which appears very frequently in a data is called a mode.
2] What is the mode of given data ? 4, 6, 5, 9, 3, 2, 7, 7, 6 5, 4, 9, 10, 10, 3, 4, 7, 6, 9, 9	Ans] Arranging given data in ascending order 2, 3, 3, 4, 4, 4, 5, 5, 6, 6, 6, 7, 7, 7, 9, 9, 9, 9, 10, 10 Hence, mode of given data is 9
3] What is mean ?	Ans] The ratio of sum of observations and the total number of observations is called as Mean.
4] What is the mean of $x+2, x+3, x+4$ and $x-2$?	Ans] Mean $= \frac{x+2+x+3+x+4+x-2}{4}$ Mean $= \frac{4x+7}{4}$

पाठाच्या पायऱ्या (Steps of Lesson)	अध्यापन मुद्दे (Teaching Points)	उद्दिष्टे व स्पष्टीकरणे (Objectives with Specification)
RECAPITULATION	① Mean $\bar{x} = \frac{\Sigma x}{N}$ x - observations N - number of observations ② Median Median = $\left(\frac{n+1}{2}\right)^{th}$ observation ③ Mode Mode = 3 × Median − 2 × Mean	*] To revise the topic taught in the class. *] To evaluate the knowledge gained by students. *] To test the concept understood by students regarding statistics.

अध्ययनानुभव (Learning Experience)	
शिक्षक कृती (Teacher Activity)	विद्यार्थी कृती (Student Activity)
Teachers ask some questions related to the topic.	Students give appropriate answers to the asked questions.
1] The median of the data 4, 6, 8, 9, 11 is-	Ans] There are 5 observations Median $= \left(\frac{5+1}{2}\right) = \frac{6}{2} = 3^{rd}$ observation Median of given data is 8
2] What is data ?	Ans] The collection of information collected for a purpose is called data.
3] What is the class mark of the class interval 90 - 120 ?	Ans] Class mark $= \frac{\text{upper limit} + \text{lower limit}}{2}$ $= \frac{120+90}{2} = 105$ Class mark of the given interval is 105.
4] What is the mean of the data 2, 3, 4, 5, 0, 1, 3, 3, 4, 3	Ans] Mean $= \frac{2+3+4+5+0+1+3+3+4+3}{10}$ $= \frac{28}{10} = 2.8$ Mean of the given data is 2.8

पाठाच्या पायऱ्या Steps of the Lesson	अध्यापन मुद्दे Teaching Points	उद्दिष्टे व विशिष्टके Objectives with Specification
HOMEWORK		*] To utilize the free time *] To create interest in the topic taught *] To understand the taught concept properly

फलक सार

Black Board Summary

Date - 23/12/23 Class - IX On roll -
Day - Friday Sub - Mathematics present -
Topic - Statistics Absent -

Mean

$$\bar{x} = \frac{\Sigma x}{n}$$

$$\bar{x} = \frac{x_1 + x_2 + x_3}{3}$$

Median

$\left(\frac{n+1}{2}\right)^{th}$ observation

Mode

= 3 median − 2 mean

Homework - Find the value of x if the mean of 4, 5, 6, 7, 8 and x is 7.

अध्ययनानुभव (Learning Experience)	
शिक्षक कृती (Teacher Activity)	विद्यार्थी कृती (Student Activity)
Teacher gives homework written on the blackboard. Homework - Find the value of x, if the mean of 4, 5, 6, 7, 8 and x is 7.	Students write it down and solve it in their notebooks.

अभिप्राय (Remarks)

Shirbade

पर्यवेक्षकाची सही
(Sign. of Supervisor)

SHEELA MULTIPURPOSE SOCIETY

SHEELADEVI COLLEGE OF EDUCATION

SHEELADEVI COLLEGE OF EDUCATION (B.Ed.) WADI NAGPUR-23

DATTAWADI (WADI), NAGPUR

2023 - 2024

LESSON OBSERVATION BOOK
पाठ निरिक्षण पुस्तिका

Name Ku Ankita Savidas Mangrax
नाव

Number _____
क्रमांक

Subject 1) Mathematics
विषय

2) Physics

Number क्रमांक 1 Date दिनांक 23-12-23

Student Teacher छात्राध्यापक Dipika P. Girgwe School शाळा Vidhyniketan high sch

Subject विषय English Class वर्ग 7th

Number विषयांश Please Don't Read this poem

LESSON OBSERVATION
पाठ निरीक्षण

१. पाठची तयारी
Preparation of the Lesson
Good Preparation of topic.
Recall the previous knowledge.

२. प्रस्तावना
Introduction
To generate curiosity among students

३. हेतुकथन
Statement of aim
① Lesson aim was clear
② Use sample words for Understanding.

४. प्रतिपादन
Presentation
① Voice was loud and clear
② Dressing was good, personality also gud.

५. शैक्षणिक साधनांचा वापर
Audio Visual Aids
① Teaching aid was good.

९. छात्र – सहभाग
Pupil - Participation
① class Interaction was good
② Pupils were interested in lesson

७. अध्यापन व वर्ग नियंत्रण
Teaching and Class Control
① class control was good.
② Discipline and teaching was good.

८. अध्यापन पध्दती
Method of Teaching
① Method of teaching was related to teaching.
② Methodology of was simple.

९. फलक लेखन
Black – Board Work
① chalk board work was good.
② Handwritting of pupil teacher was good.

१०. पुनरावलोकन
Recapitulation
① Recapitulation was effective.
② Pupils were understood the lesson.

११. विधायक सूचना
Constructive Suggestions
① Pupils teacher can teach better.

१२. मूल्यांकन
Evaluation

			✓		
निकृष्ट	बरा	साधारण	चांगला	उत्तम	अत्युत्तम

पर्यवेक्षकाची स्वाक्षरी

छात्राध्यापकाची स्वाक्षरी

2 | Date / दिनांक: 23-12-23
Rajani D. Bankar | School / शाळा: Rukminibai Dhawad Vidhyaniketan highschool.
commerce | Class / वर्ग: 9th
[illegible]

LESSON OBSERVATION
पाठ निरीक्षण

पाठाची तयारी
Preparation of the Lesson: Previous knowledge was not done properly.

प्रस्तावना
Introduction: ① well introduce of lesson.
② Introduction lesson with simple language.

हेतुकथन
Statement of aim: ① Lesson aim was clear.
② Use simple words for understanding.

प्रतिपादन
Presentation: ① Body language was good.
② class interaction was good.

शैक्षणिक साधनांचा वापर
Audio Visual Aids: ① Teaching aids was good. ② Used teaching material.

७. छात्र – सहभाग
Pupil - Participation
① Pupil took interest in teaching. ② Pupil listen carefully.

७. अध्यापन व वर्ग नियंत्रण
Teaching and Class Control
① class interaction was good. ② Pupil teacher control class was good.

८. अध्यापन पध्दती
Method of Teaching
① Teaching aid was interesting ② Methodology was different.

९. फलक लेखन
Black – Board Work
① Chalk board was not good ② Handwritting was good.

१०. पुनरावलोकन
Recapitulation
① Recapitulation was not much effective.

११. विधायक सूचना
Constructive Suggestions
② Improve knowledge

१२. मूल्यांकन
Evaluation

			✓		
निकृष्ट	बरा	साधारण	चांगला	उत्तम	अत्युत्तम

पर्यवेक्षकाची स्वाक्षरी

RBunkar
छात्राध्यापकाची स्वाक्षरी

Number 3 Date 26-12-23

Student Teacher Harshali chopde School Rukminibai Dhavad high school.

Subject Science (Physics) Class 7th

Name of Lesson Types of friction

LESSON OBSERVATION
पाठ निरीक्षण

1. पाठाची तयारी
Preparation of the Lesson — collection of material was good for teaching.

2. प्रस्तावना
Introduction — ① well introduce of lesson.
② Introduction of lesson with systematically.

3. हेतुकथन
Statement of aim — ① lesson aim was clear
② Use simple word for understanding.

4. प्रतिपादन
Presentation — ① Body Language and dressing was good.
② class interaction was good.

5. दैनंदिन साधनांचा वापर
Audio Visual Aids — ① Teaching aid was good.
② Used teaching material.

६. छात्र – सहभाग
Pupil - Participation
① Pupil took interest in teaching
② Pupil listen carefully.

७. अध्यापन व वर्ग नियंत्रण
Teaching and Class Control
① class interaction was good
② Pupil teacher class control was good.

८. अध्यापन पध्दती
Method of Teaching
① Teaching aid was interesting
② Methodology was different.

९. फलक लेखन
Black – Board Work
① chalk - board work was good.
② Handwritting was too small.

१०. पुनरावलोकन
Recapitulation
Recapitulation was effective

११. विधायक सूचना
Constructive Suggestions
Improve handwritting.

१२. मूल्यांकन
Evaluation

			✓		
निकृष्ट	बरा	साधारण	चांगला	उत्तम	अत्युत्तम

H. Chopade

पर्यवेक्षकाची स्वाक्षरी

छात्राध्यापकाची स्वाक्षरी

Number 4 क्रमांक

Date 26-12-23 दिनांक

Student Teacher Ranjana Bhaktude छात्राध्यापक

School Rukminibai Dhanod ... shala niketan high school, ...

Subject Marathi विषय

Class 9th वर्ग

Number ... विषयांश

LESSON OBSERVATION
पाठ निरीक्षण

१. **पाठची तयारी** **Preparation of the Lesson**
① Question was on previous knowledge
② Previous knowledge testing was relevant to the topic.

२. **प्रस्तावना** **Introduction**
① Pupil teacher was confident in teaching. ② Introduction of lesson was systematic.

३. **हेतुकथन** **Statement of aim**
① lesson aim was clear.
② Didn't use hard worlds to explain the lesson.

४. **प्रतिपादन** **Presentation**
① Voice was loud and close.
② Dressing was good, personality also good.

५. **शैक्षणिक साधनांचा वापर** **Audio Visual Aids**
① Teaching aid was good.

६. छात्र – सहभाग
Pupil - Participation
① class interaction was good.
② Pupils were intersect in lesson.

७. अध्यापन व वर्ग नियंत्रण
Teaching and Class Control
① class interaction was good.
② Pupils teacher control class was good.

८. अध्यापन पध्दती
Method of Teaching
① Teaching aid was interesting.
② Methodology was different.

९. फलक लेखन
Black – Board Work
① chalk board work was not good.
② Handwritting was not good.

१०. पुनरावलोकन
Recapitulation
① Recapitulation was not much effective.

११. विधायक सूचना
Constructive Suggestions
① Improve handwritting, try to write in little bit big letter

१२. मूल्यांकन
Evaluation

		✓			
निकृष्ट	बरा	साधारण	चांगला	उत्तम	अत्युत्तम

पर्यवेक्षकाची स्वाक्षरी

छात्राध्यापकाची स्वाक्षरी

Number 5 क्रमांक

Date 26-12-23 दिनांक

Student Teacher Rajashri Nikode अध्यापक

School Rukminibai Dhavad. शाळा high school, Dabba

Subject English विषय

Class 9th वर्ग

Number Tense विषयांश

LESSON OBSERVATION
पाठ निरीक्षण

१. **पाठची तयारी** **Preparation of the Lesson**
① Previous knowledge of teaching was relevant to the topic.
② short revise of previous lesson.

२. **प्रस्तावना** **Introduction**
① Introduction of lesson was systematically.
② Pupil teacher was fully confident.

३. **हेतुकथन** **Statement of aim**
① Pupil will understand lesson.
② Basic concept will clear.

४. **प्रतिपादन** **Presentation**
① Presentation was good.
② Voice was slow, but expression was good.

५. **शैक्षणिक साधनांचा वापर** **Audio Visual Aids**
① Use teaching material.
② books, copies were available to pupils.

६. छात्र – सहभाग
Pupil - Participation
(1) Pupils was not listen carefully.
(2) Pupils had many confusion.

७. अध्यापन व वर्ग नियंत्रण
Teaching and Class Control
(1) Discipline was not good.
(2) class interaction was not good.

८. अध्यापन पध्दती
Method of Teaching
(1) Teaching was complicated.
(2) Methodology was difficult.

९. फलक लेखन
Black – Board Work
(1) chalk - board work was less.

१०. पुनरावलोकन
Recapitulation
(1) Recapitulation was not much effective.

११. विधायक सूचना
Constructive Suggestions
(1) Improve teaching method.
(2) Improve pronunciations.

१२. मूल्यांकन
Evaluation

		✓			
निकृष्ट	बरा	साधारण	चांगला	उत्तम	अत्युत्तम

पर्यवेक्षकाची स्वाक्षरी

छात्राध्यापकाची स्वाक्षरी

Roll No. 6 Date 27-12-23
दिनांक

Student Teacher Radhika Sanjay Thakare School Rukminibai Dhavad high
शाळा school, Dabha.

Subject Math Class 8th
विषय वर्ग

Name of Topic Triangle and its type
विषयाचे नाव

LESSON OBSERVATION
पाठ निरीक्षण

१. पाठची तयारी
Preparation of the Lesson
① Previous knowledge was not done properly

२. प्रस्तावना
Introduction
① Well introduction of lesson.
② Introduce lesson with simple language.

३. हेतुकथन
Statement of aim
① lesson aim was clear.
② Use simple words for understanding

४. प्रतिपादन
Presentation
① Body language was good.
② class interaction was good.

५. शैक्षणिक साधनांचा वापर
Audio Visual Aids
① Teaching aid was good.

६. छात्र – सहभाग
Pupil - Participation
① Pupils listen and learn carefully.
② pupils asks questions.

७. अध्यापन व वर्ग नियंत्रण
Teaching and Class Control
① class was in discipline.
② students write all the black board work in their copies.

८. अध्यापन पध्दती
Method of Teaching
① Methodology was good.
② Exploring method was different.

९. फलक लेखन
Black – Board Work
① Chalk - board work was good.
② Use different colour of chalk.

१०. पुनरावलोकन
Recapitulation
① Recapitulation was good.
② Pupil interaction was good.

११. विधायक सूचना
Constructive Suggestions
① Improve voice quality.

१२. मूल्यांकन
Evaluation

				✓	
निकृष्ट	बरा	साधारण	चांगला	उत्तम	अत्युत्तम

पर्यवेक्षकाची स्वाक्षरी

छात्राध्यापकाची स्वाक्षरी

Number 7 Date 27-12-23
क्रमांक दिनांक

Student Teacher Gaurav Thakre School Rukminibai Dhanpad high
छात्राध्यापक शाळा School, Dabha.

Subject Mathematics Class 10th
विषय वर्ग

Number Trigonometry
विषयांश

LESSON OBSERVATION
पाठ निरीक्षण

१. **पाठची तयारी**
Preparation of the Lesson
① Made previous knowledge testing was relevant to the topic.
② question was on previous knowledge.

२. **प्रस्तावना**
Introduction
① Pupil teachers was confident in teaching ② Introduction of lesson was systematic.

३. **हेतुकथन**
Statement of aim
① lesson aim was clear.
② Didn't we use hardwords to explain the lesson.

४. **प्रतिपादन**
Presentation
① voice was sweet but slow.
② Dressing was good, personality also good.

५. **शैक्षणिक साधनांचा वापर**
Audio Visual Aids
① Teaching aid was good.

६. छात्र – सहभाग
Pupil - Participation

① pupils listen carefully.
② Pupils had many confusion.

७. अध्यापन व वर्ग नियंत्रण
Teaching and Class Control

① Discipline was not good.
② class interaction was not good.

८. अध्यापन पध्दती
Method of Teaching

① Teaching was complicated.
② Methodology was difficult.

९. फलक लेखन
Black – Board Work

① chalk-board work was less.

१०. पुनरावलोकन
Recapitulation

① Recapitulation was not much effective.

११. विधायक सूचना
Constructive Suggestions

① Improve teaching method.
② Improve or clear pronunciation.

१२. मूल्यांकन
Evaluation

		✓			
निकृष्ट	बरा	साधारण	चांगला	उत्तम	अत्युत्तम

पर्यवेक्षकाची स्वाक्षरी

छात्राध्यापकाची स्वाक्षरी

Number 8 Date 27-12-23
क्रमांक दिनांक

Student Teacher Pratiksha Jangam School Rukminbai Dhavad hi/
छात्राध्यापक शाळा school Dabha.

Subject Marathi Class 10 वी
विषय वर्ग

Number काळ कर्ता
विषयांश

LESSON OBSERVATION
पाठ निरीक्षण

१. **पाठची तयारी**
Preparation of the Lesson
(1) Previous knowledge of testing was relevant to the topic.
(2) short revise of previous lesson.

२. **प्रस्तावना**
Introduction
(1) well introduction of lesson.
(2) Introduce lesson with simple language

३. **हेतुकथन**
Statement of aim
(1) lesson aim was clear
(2) Use simple words for understanding

४. **प्रतिपादन**
Presentation
(1) Body language was good.
(2) class interaction was good.

७. **शैक्षणिक साधनांचा वापर**
Audio Visual Aids
(1) Teaching aid was good.

६. छात्र – सहभाग
Pupil - Participation

① pupil took interest in teaching
② pupil listen carefully.

७. अध्यापन व वर्ग नियंत्रण
Teaching and Class Control

① class interaction was good.
② pupil teacher control class was good.

८. अध्यापन पध्दती
Method of Teaching

① Teaching aid was interesting
② methodology was different.

९. फलक लेखन
Black – Board Work

① chalk - board work are not good
② Handwriting was not good.

१०. पुनरावलोकन
Recapitulation

① Recapitulation was not much effective.

११. विधायक सूचना
Constructive Suggestions

Improve handwriting.

१२. मूल्यांकन
Evaluation

निकृष्ट	बरा	साधारण	चांगला	उत्तम	अत्युत्तम
			✓		

छात्राध्यापकाची स्वाक्षरी

Number / अनांक: 9 Date / दिनांक: 28-12-23

Student Teacher / अध्यापक: Chitralekha Patle School / शाला: Rukminibai Dhawad Hi... school Dabha

Subject / विषय: Biology Class / वर्ग: 9th

Number / विषयांश: photosynthesis

LESSON OBSERVATION
पाठ निरीक्षण

१. **पाठाची तयारी** / **Preparation of the Lesson**: Previous knowledge was not done properly.

२. **प्रस्तावना** / **Introduction**:
① well introduction of lesson.
② Introduce lesson with the good language.

३. **हेतुकथन** / **Statement of aim**:
① lesson aim was good.
② Use simple words for understanding.

४. **प्रतिपादन** / **Presentation**:
① Body language was good.
② class interaction was good.

५. **शैक्षणिक साधनांचा वापर** / **Audio Visual Aids**: Teaching aids was good.

६. छात्र – सहभाग
Pupil - Participation
(1) pupils listen & learn carefully.
(2) pupils ask questions

७. अध्यापन व वर्ग नियंत्रण
Teaching and Class Control
(1) class was in discipline
(2) students write all the black board work in their copies.

८. अध्यापन पध्दती
Method of Teaching
(1) methodology was good.
(2) Explaining method was different

९. फलक लेखन
Black – Board Work
(1) chalk - board work was good.
(2) use different colour of chalk.

१०. पुनरावलोकन
Recapitulation
(1) Recapitulation was good.
(2) pupil interaction was good

११. विधायक सूचना
Constructive Suggestions
Increase voice quality.

१२. मूल्यांकन
Evaluation

			✓		
निकृष्ट	बरा	साधारण	चांगला	उत्तम	अत्युत्तम

पर्यवेक्षकाची स्वाक्षरी

छात्राध्यापकाची स्वाक्षरी

M..

Number 10 — Date 28-12-23
क्रमांक — दिनांक

Student Teacher Pratiksha Thakre — School Rukminibai Dhawade School, Dabha
छात्राध्यापक — शाळा

Subject Physics — Class 9th
विषय — वर्ग

Number Motion
विषयांश

LESSON OBSERVATION
पाठ निरीक्षण

१. पाठाची तयारी
Preparation of the Lesson
① previous knowledge of testing was relevant to the topic.
② short revise of previous lesson

२. प्रस्तावना
Introduction
① Introduction of lesson was systematically.
② pupil teacher was fully confident.

३. हेतुकथन
Statement of aim
① Pupil will understand lesson.
② Basic concept will clear.

४. प्रतिपादन
Presentation
① Presentation was good.
② Voice was slow, but expression was good.

५. शैक्षणिक साधनांचा वापर
Audio Visual Aids
① Use teaching material
② Books, copies, were available to pupils.

सही

६. छात्र – सहभाग
Pupil - Participation
① Pupil lessen and listen carefully.
② pupils ask questions.

७. अध्यापन व वर्ग नियंत्रण
Teaching and Class Control
① class was in discipline.
② students write all the black-board work in their copies.

८. अध्यापन पध्दती
Method of Teaching
① methodology was good.
② Explaining method was different

९. फलक लेखन
Black – Board Work
① chalk board work was good.
② Use different colour of chalk.

१०. पुनरावलोकन
Recapitulation
① Recapitulation was good.
② pupil interaction was good.

११. विधायक सूचना
Constructive Suggestions
Increase voice quality.

१२. मूल्यांकन
Evaluation

निकृष्ट	बरा	साधारण	चांगला	उत्तम	अत्युत्तम
				✓	

पर्यवेक्षकाची स्वाक्षरी

छात्राध्यापकाची स्वाक्षरी