सरावपाठाचे नियोजन
Lesson Planing

विद्यार्थी शिक्षकाचे नांव : (Name of the Pupil-Teacher) Ekdanti A. Shinde
हजेरी क्रमांक : (Roll No.) 22

शाळेचे नांव : (Practicing School) M.V.D.H. Jr College
इयत्ता : (Std.) 11th
तुकडी : (Div.) Science

पाठ क्रमांक : (Lesson No.) 4
तासिका : (Period) 3
वेळ : (Time) 1.20 - 2.00pm

विषय : (Subject) Maths-II
घटक : (Unit) Permutations & Combinations
उपघटक : (Sub - Unit) Remaining properties of factorial notation.

पाठ्यांशाममधील समाविष्ट मूल्य व गाभाभूत घटक : (Including Values & Core - elements) To inculcate values like national integrity and neatness.

अपेक्षित पूर्वज्ञान : (Expected Previous Knowledge) Factorial notation definition and 3 properties of factorial notations should be known to student.

प्रस्तावना : (Introduction) Teacher rewise the topic by asking few questions.

Teachers Activity	Student Activity
Q.1) How is factorial notation n is denoted?	Ans → $n!$
Q.2) Can you tell me the property when $n>1$?	Ans: $n>1$, $n! = n \times (n-1) \times (n-2)!$
Q.3) Can you tell me $(m+n)! = ?$	Ans - No answer Teacher answer the qsth. $(m+n)! \neq m! + n!$

हेतुकथन : (Satatement of Aim) Today we are going to learn about the remaining properties of Factorial notation.

संदर्भ साहित्य / शैक्षणिक साहित्य : (Reference Material / Teaching Aids) Properties of Addition & Multiplication.

पाठ्यमुद्दे Teaching Points	उद्देष्टे व स्पष्टीकरण Specific Objectives & Specification	शिक्षक कृती Teacher's Acitivity	विद्यार्थी कृती Student's Acitivity
Properties of factorial notation.	Knowledge:- To help the student to acquire the knowledge of properties of factorial notation.	Teacher explains the properties of factorial. Starting 3 properties is studied in previous lesson. we will start from 4th property. 4) $(m+n)!$ is always divisible by $m!$ as well as $n!$	
	Explanation:- The student acquires the knowledge of properties of factorial notation.	Teacher explains 4th property. Ex:- $(3+4)!$ is divisible by $3!$ as well as $4!$	
	Understanding:- To help the student to understand the properties of factorial notation.	5) $(m \times n)! \neq m! \times n!$ Teacher explains 5th property. The m multiply by n the whole factorial is not equal to m factorial multiply by n factorial.	Student listens carefully.
	Explanation:- The student understands the properties of factorial notation.	Ex.) $(2 \times 3)! \neq 2! \times 3!$ 6) $(m+n)! \neq m! + n!$ The m addition n the whole factorial is not equal to m factorial plus n factorial. Ex. $(2+3)! = 2! + 3!$	
		7) $m > n$ $(m-n)! \neq m! - n!$ $m!$ is divisible by $n!$ Teacher explains 7th property. when m is greater than n, m minus n the whole factorial is not equal to m factorial minus n factorial but m factorial is divisible by n factorial. Ex. $(3-2)! \neq 3! - 2!$ but $3!$ is divisible by $2!$	Student listens carefully.
		8) $(m \div n)! \neq m! \div n!$ Teacher explains 8th property.	

पाठ्यमुद्दे Teaching Points	उद्दिष्टे व स्पष्टीकरण Specific Objectives & Specification	अध्ययन अनुभव	
		शिक्षक कृती Teacher's Acitivity	विद्यार्थी कृती Student's Acitivity
		m divides n the whole factorial which is not equal to m factorial divides n factorial. Ex.) $(3\div2)! \neq 3! \div 2!$	student understands properties.
Ex.1) Show that $(7-3)! \neq 7! - 3!$	Application:- To help the student to solve the example based on the properties of factorial notation	Sol^n:- $(7-3)! = 4!$ $4! = 4\times3\times2\times1 = 24$ $7! = 7\times6\times5\times4\times3\times2\times1 = 5040$ $3! = 3\times2\times1 = 6$ $7! - 3! = 5040 - 6 = 5034$ $\therefore (7-3)! \neq 7! - 3!$	
Ex.2) Show that $(5-2)! \neq 5! - 2!$	Explanation:- The student solves the example based on the properties of factorial notation	Sol^n:- $(5-2)! = 3!$ $3! = 3\times2\times1 = 6$ $5! = 5\times4\times3\times2\times1 = 120$ $2! = 2\times1 = 2$ $5! - 2! = 120 - 2 = 118$ $\therefore (5-2)! \neq 5! - 2!$	student solves the example.
Closure:-	In this way we studied the properties of factorial notation with examples.		

मुल्यमापन (Evaluation)

1) Solve $10! - 6!$

2) $(m \div n)! \neq$ _____ ?

3) $(m+n)! \neq$ _____ ?

स्वाध्याय (Assignment) Solve $(10-6)!$

दिनांक 29/11/22

फलकलेखन
विषय - Maths-II
घटक - Permutations & combinations
उपघटक - Properties of factorial notation.

Properties of factorial notation:-

4) $(m+n)!$ always divisible by $m!$ as well as by $n!$ e.g. $(3+4)!$ is divisible by $3!$ as well as $4!$.
5) $(m \times n)! \neq m! \times n!$
6) $(m+n)! \neq m! + n!$
7) $m > n$, $(m-n)! \neq m! - n!$ but $m!$ is divisible by $n!$
8) $(m \div n)! \neq m! \div n!$

Examples:-

1) Show that $(7-3)! \neq 7! - 3!$

Sol") $(7-3)! = 4!$

$4! = 4 \times 3 \times 2 \times 1 = 24$

$7! = 7 \times 6 \times 5 \times 4 \times 3 \times 2 \times 1 = 5040$

$3! = 3 \times 2 \times 1 = 6$

$7! - 3! = 5040 - 6 = 5034$

$\therefore (7-3)! \neq 7! - 3!$

निरीक्षकांच्या सुचना

प्रस्तावना (Self Induction): By asking questions related to previous topic. But set induction was very short.

हेतुकथन स्पष्टता (Clarify of Aim): The aim of lesson stated clearly.

आशयज्ञान आणि तयारी (Content Knowledge): Good content knowledge.

अध्यापन पद्धती (Method): Deduction method was used. Also questions were asked in between.

नाविन्यता : आकर्षकता (Any Noveilty & Attractive Techniqes): Lake of noveilty and Attractive Techniques

विद्यार्थी सहभाग (Students Participation): Students were actively engaged in the lesson.

शैक्षणिक साधनांचा वापर (Use of Teaching Aids): A chart of Properties of factorial notation was made by teacher

वर्गव्यवस्थापन (Classroom Management): Maintained good classroom management She had control over content as well as student.

शिक्षकांची वर्तणुक / अभिवृत्ती (Behaviount Attitude of Teacher): The teacher created a perpetful and inclusive atmosphere. She was punctual.

फलकलेखन (C.B. Work): Neat and clean chalk board work.

मूल्यमापन (Evaluation): Formative assessment was integrated.

एकंदरीत पाठाचे प्रस्तुतीकरण (Overall Performance): (Average / Fair / Satisfactory / Good / V. Good / Excellent)

Feedback : Use some attractive Techniques & innovatives ideas for set induction

Somkale R

मार्गदर्शक (Guide by)
(Name & Sign.)

निरीक्षक (Observed by)
(Name & Sign.)