

DAILY LESSON LOG OF M10SP-IIIa-2 (3Week One – Day Three)

School		Grade Level	Grade 10																																																						
Teacher		Learning Area	Mathematics																																																						
Teaching Date and Time		Quarter	Third Quarter																																																						
I. OBJECTIVES	Objectives must be met over the week and connected to the curriculum standards. To meet the objectives, necessary procedures must be followed and if needed, additional lessons, exercises and remedial activities may be done for developing content knowledge and competencies. These are assessed using Formative Assessment Strategies. Valuing objectives support the learning of content and competencies and enable children to find significance and joy in learning the lessons. Weekly objectives shall be derived from the curriculum guides.																																																								
A. Content Standards	The learner demonstrates understanding of key concepts of combinatorics and probability.																																																								
B. Performance Standards	The learner is able to use precise counting technique and probability in formulating conclusions and making decisions.																																																								
C. Learning Competencies/ Objectives	Learning competency: Derives the formula for finding the number of permutations of n objects taken r at a times (M10SP-IIIa-2) Learning Objectives: 1. Identify permutation 2. Derive the formula for finding the number of permutations of n objects taken r at a time 3. Appreciate the importance of deriving formulas of permutation																																																								
II. CONTENT	Statistics and Probability																																																								
III. LEARNING RESOURCES	teacher’s guide, learner’s module																																																								
A. References																																																									
1. Teacher’s Guide pages	Pages 242 - 259																																																								
2. Learner’s Materials pages	Pages 275 - 300																																																								
3. Textbook pages																																																									
4. Additional Materials from Learning Resource (LR) portal																																																									
B. Other Learning Resources																																																									
IV. PROCEDURES	These steps should be done across the week. Spread out the activities appropriately so that pupils/students will learn well. Always be guided by demonstration of learning by the pupils/ students which you can infer from formative assessment activities. Sustain learning systematically by providing pupils/students with multiple ways to learn new things, practice the learning, question their learning processes, and draw conclusions about what they learned in relation to their life experiences and previous knowledge. Indicate the time allotment for each step.																																																								
A. Review previous lesson or presenting the new lesson	As part of introduction to the topic the teacher discusses the answer of the assignment given last meeting. Activity 4: Let’s Find Out ,Page 286-287 of the learners module. Key: Results: (Summary) <table><tr><th>Number of Objects (n)</th><th>Number of Objects Taken at a Time (r)</th><th>Number of Possible Arrangements/ Permutations</th></tr><tr><td>2</td><td>1</td><td>2</td></tr><tr><td>2</td><td>2</td><td>2</td></tr><tr><td>3</td><td>1</td><td>3</td></tr><tr><td>3</td><td>2</td><td>6</td></tr><tr><td>3</td><td>3</td><td>6</td></tr><tr><td>4</td><td>1</td><td>4</td></tr><tr><td>4</td><td>2</td><td>12</td></tr><tr><td>4</td><td>3</td><td>24</td></tr><tr><td>4</td><td>4</td><td>24</td></tr></table> Answers to Guide Questions: - Each arrangement is called a permutation. - The pattern that can be seen is in the fourth column below: <table><tr><th>Number of Objects (n)</th><th>Number of Objects Taken at a Time (r)</th><th>Number of Possible Arrangements /Permutations</th><th>Pattern</th></tr><tr><td>2</td><td>1</td><td>2</td><td>$2 = 2$</td></tr><tr><td>2</td><td>2</td><td>2</td><td>$(2)(1) = 2$ (2 factors)</td></tr><tr><td>3</td><td>1</td><td>3</td><td>$3 = 3$</td></tr><tr><td>3</td><td>2</td><td>6</td><td>$(3)(2) = 6$ (2 factors)</td></tr><tr><td>3</td><td>3</td><td>6</td><td>$(3)(2)(1) = 6$ (3 factors)</td></tr></table>			Number of Objects (n)	Number of Objects Taken at a Time (r)	Number of Possible Arrangements/ Permutations	2	1	2	2	2	2	3	1	3	3	2	6	3	3	6	4	1	4	4	2	12	4	3	24	4	4	24	Number of Objects (n)	Number of Objects Taken at a Time (r)	Number of Possible Arrangements /Permutations	Pattern	2	1	2	$2 = 2$	2	2	2	$(2)(1) = 2$ (2 factors)	3	1	3	$3 = 3$	3	2	6	$(3)(2) = 6$ (2 factors)	3	3	6	$(3)(2)(1) = 6$ (3 factors)
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	<table><tr><td><u>4</u></td><td>2</td><td>12</td><td>(4)(3) = 12 (2 factors)</td></tr><tr><td><u>4</u></td><td>3</td><td>24</td><td>(4)(3)(2) = 24 (3 factors)</td></tr><tr><td><u>4</u></td><td>4</td><td>24</td><td>(4)(3)(2)(1) = 24 (3 factors)</td></tr></table> Notice that the first number in the multiplication in the fourth column is equal to the value of n in the first column, and that the number of factors is equal to the value of r in the second column. Page 253 of the teacher's guide From the activity the teacher emphasizes on how the formula is derived	<u>4</u>	2	12	(4)(3) = 12 (2 factors)	<u>4</u>	3	24	(4)(3)(2) = 24 (3 factors)	<u>4</u>	4	24	(4)(3)(2)(1) = 24 (3 factors)
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B. Establishing a purpose for the lesson	The teacher lets the students understand that the concept of permutation helps in forming conclusions and making wise decisions.												
C. Presenting examples/ instances of the new lesson	The teachers asks the students, "How do we find the permutations of objects? " Suppose we have 6 different potted plants and we wish to arrange 4 of them in a row. In how many ways can this be done? We can determine the number of ways these plants can be arranged in a row if we arrange only 4 of them at a time. Each possible arrangement is called a permutation. The permutation of 6 potted plants taken 4 at a time is denoted by $P(6, 4)$, ${}_6P_4$, $P_{6,4}$. Similarly, if there are n objects which will be arranged r at a time, it will be denoted by $P(n, r)$. The permutation of n objects taken r at a time is denoted by $P(n, r)$. In some books, it is also denoted by nPr, Pn,r , or P^n_r. In our learning material we will use the first notation.												
D. Discussing new concepts and practicing new skills #1	To know the process of solving the following problems, the teacher lets the students read and understand page 287 - 289 1. Given the 4-letter word READ. In How many ways can we arrange the letters, 3 at a time? 2. In a school club, there are 5 possible choices for the president, a secretary, a treasurer and an auditor. Assuming that each of them is qualified for any of these positions, in how many ways can 4 officers be elected? Key: 1. 24 2. 120 ways												
E. Discussing new concepts and practicing new skills #2	The teacher discusses the example below: What if there are 5 objects to be arranged and we would arrange all of them every time? That is, $n = 5$, and $r = 5$. Example 3. In how many ways can 5 people arrange themselves in a row for picture taking? Solution: $n = 5$, $r = 5$ $P(5, 5) = 5 \cdot 4 \cdot 3 \cdot 2 \cdot 1$ (5 factors) $= 120$ possible pictures  In the third example, we used all the numbers from $n = 5$ down to 1. Another way of writing $5 \cdot 4 \cdot 3 \cdot 2 \cdot 1$ is $5!$ (read as 5 factorial) Similarly, $4! = 4 \cdot 3 \cdot 2 \cdot 1 = 24$ $8! = 8 \cdot 7 \cdot 6 \cdot 5 \cdot 4 \cdot 3 \cdot 2 \cdot 1 = 40\,320$ $3! = 3 \cdot 2 \cdot 1 = 6$ $10! = 10 \cdot 9 \cdot 8 \cdot 7 \cdot 6 \cdot 5 \cdot 4 \cdot 3 \cdot 2 \cdot 1 = 3\,628\,800$ $1! = 1$ For convenience, we define $0! = 1$. Thus, in example 3, $P(5, 5) = 5! = 120$. Also, $P(8, 8) = 8! = 40\,320$ $P(4, 4) = 4! = 24$. In addition, since $P(n, r) = \frac{n(n-1)(n-2)\cdots(n-r+1)}{(n-r)!}$ $= \frac{n(n-1)(n-2)\cdots(n-r+1)(n-r)!}{(n-r)!}$ Then, $P(n, r) = \frac{n!}{(n-r)!}$												

	Remember: The permutation of n objects taken r at a time is: $P(n, r) = \frac{n!}{(n-r)!}, \quad n \geq r$ and the permutation of n objects taken all at a time is: $P(n, n) = n!$
F. Developing mastery (leads to formative assessment 3)	The teacher lets the students answer the activity by pair Solve: 1. $P(6, 6) = \underline{\hspace{2cm}}$ 2. $P(7, 4) = \underline{\hspace{2cm}}$ 3. $P(5, 3) = \underline{\hspace{2cm}}$ 4. $P(9, 3) = \underline{\hspace{2cm}}$ 5. $P(10, 5) = \underline{\hspace{2cm}}$ Key: 1. 720 2. 840 3. 60 4. 504 5. 30240
G. Finding practical applications of concepts and skills in daily living	
H. Making generalizations and abstractions about the lesson	The teacher emphasizes about permutation in general, distinguishable permutation and the formulas used to solve permutation
I. Evaluating Learning	The teacher lets the student answer the activity. Solve the unknown in each item, and then answer the questions that follow. 1. $P(8, r) = 6720$ 2. $P(8, 3) = \underline{\hspace{2cm}}$ 3. $P(n, 4) = 3024$ 4. $P(12, 3) = \underline{\hspace{2cm}}$ 5. $P(13, 2) = \underline{\hspace{2cm}}$ Key: 1. 5 2. 336 3. 9 4. 1320 5. 156
J. Additional activities or remediation	The teacher gives the activity and let the students answer the following 1. Find $P(7, 3)$ 2. Find $P(15, 5)$ 3. $P(5, 5)$ Answers: 1. 210 2. 360,360 3. 120
V. REMARKS	
VI. REFLECTION	<i>Reflect on your teaching and assess yourself as a teacher. Think about your students' progress. What works? What else needs to be done to help the pupils/students learn? Identify what help your instructional supervisors can provide for you so when you meet them, you can ask them relevant questions.</i>
A. No. of learners who earned 80% of the evaluation	
B. No. of learners who require additional activities for remediation who scored below 80%	
C. Did the remedial lesson work? No. of learners who have caught up with the lesson.	
D. No. of learners who continue to require remediation	
E. Which of my teaching strategies worked well? Why did these work?	
F. What difficulties did I encounter which my principal	

or supervisor can help me solve?	
G. What innovation or localized materials did I use/ discover which I wish to share with other teachers	