DAILY LESSON LOG OF MA10SP -IIId-1 (Week Four- Day One)

School		**Grade Level**	Grade 10
Teacher		**Learning Area**	Mathematics
Teaching Date and Time		**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.
B. Performance Standards	The learner is able to use precise counting techniques in formulating conclusion and making decisions.
C. Learning Competencies/ Objectives	Learning Competency: Derives the formula for finding the number of combinations of n objects taken r at a time (**MA10SP -IIId-1)** 1.Determine the combination of n objects taken at a time ; 2. Derive the formula for finding the number of combinations of n objects taken r at a time. ; 3. Show patience in deriving the formula for finding the number of combinations of n objects taken r at a time. ;
II. CONTENT	Combination
III. LEARNING RESOURCES	Teacher's Guide, Learner's Module
A. References	
1. Teacher's Guide pages	Pages 259-265
2. Learner's Materials pages	Pages 301-309
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	The teacher asks the question, "What is the difference between permutation and combination of n object taken r at a time?" Answer: The number of arrangements in permutation is greater than combination. The order of arrangement in permutation is really matter while in combination does not matter.
B. Establishing a purpose for the lesson	The teacher says that, " Today's lesson we will derive the formula for finding the number of combinations of n objects taken r at a time." Let the students realize that the combination formula will make the computation easier and shorter in finding the number of n objects taken r at a time.
C. Presenting examples/ instances of the new lesson	The teacher lets the students work by triad and do the following: 1.Form different triangles out of four points of which no three are collinear. 2. List all the possible names of triangles in which order is important. How many possibilities are there? 4. List all the possible names of triangles in which order is not important. How many possibilities are there? Answer: Possible figure:  3. ABC ABD ACD BCD

	ACB ADB ADC BDC BCA BAD DAC CBD BAC BDA DCA CDB CAB DAB CAD DBC CBA DBA CDA DBC There are 24 possible arrangements. 4. ABC, ABD, ACD, BCD There are 4 arrangements.
D. Discussing new concepts and practicing new skills #1	The teacher discusses the process of deriving the formula for finding the number of combinations of n objects taken r at a time. The teacher says that, " The number of different orders of 4 vertices taken three at a time is given by $P(4,3)=\frac{4!}{(4-3)!}$ $=\frac{4.3.2.1}{1!}$ = 24 There are 24 possibilities .Since you learned in Geometry that we can name a triangle using its vertices in any order, then if we look more closely , we can see that all the triangles in the same column are identical . Thus , the actual number of combination is $C(4,3)=\frac{24}{6}$ or $P=\frac{(4,3)}{6}$ or $=\frac{(4,3)}{3!}$ (Equation 1) Notice that 6 or 3! Is the number of ways of arranging 3 objects taken all at a time . We divided by 3! to eliminate duplicates. Note: There are 4 objects (A,B,C,D) ---- n = 4 They are selected 3 at a time --- r= 3 And so equation (1) becomes $C(n,r)=\frac{P(n,r)}{r!}$ Since $P(n,r)=\frac{n!}{(n-r)!}$ Then $C(n,r)=\frac{P(n,r)}{r!}$ $C(n,r)=\frac{n!}{\frac{(n-r)!}{r!}}$ $C(n,r)=\frac{n!}{r!(n-r)!}$, $n \geq r \geq 0$ The formula for finding the combination of n objects taken r at a times." Other notations for combination of n objects taken r at a time: ${}_nC_r$ and C_r^n So, using the formula: n=4 and r = 3 $C(n,r)=\frac{n!}{r!(n-r)!}$ Substituting to the formula $C(4,3)=\frac{4!}{3!(4-1)!}$ Simplifying $C(4,3)=\frac{4.3.2.1}{3.2.1.1}$ C(4,3) = 4
E. Discussing new concepts and practicing new skills #2	The teacher discusses thoroughly how to apply the combination formula to determine the combination of n objects taken r at a time . Illustrative examples : 1.$C(7,3)=\frac{7!}{3!(7-3)!}$ $C(7,3) = \frac{7.6.5.4.3.2.1}{3.2.1.4.3.2.1.}$ C(7, 3) = 35 2. (8,2) = $\frac{8!}{2!(8-2)!}$ $C(8,2)=\frac{8.7.6.5.4.3.2.1}{2.1.6.5.4.3.2.1}$ C (8,2) = 28
F. Developing mastery (leads to formative assessment 3)	The teacher lets the students work in pair to answer Activity 5,"Flex That Brain "page 311 numbers 1-5 of the Learner's Module. Answer Key: 1. 56 2. 6 3. 226 4. 1 5. 7

G. Finding practical applications of concepts and skills in daily living	
H. Making generalizations and abstractions about the lesson	The teacher summarizes the mathematical concepts on the difference of permutation and combination through questions like: 1. What is the formula for finding the number of combination of n objects taken r at a time? Answer: C(n,r) = $\frac{n!}{r!(n-r)!}$, n≥ r ≥0 or nC r = $\frac{n!}{r!(n-r)!}$, n≥ r ≥0
I. Evaluating Learning	The teacher let the students answer individually the formative assessment. Evaluate: 1. C(9,3) 2.C(10,3) 3.C(12,12) 4. $_8C_6$ 5. $_4C_2$ Answer: 1. 84 2. 120 3.1 4. 28 5.6
J. Additional activities or remediation	
a. REMARKS	
b. REFLECTION	*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.*
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	