Detailed Lesson Plan in Mathematics 7

I. OBJECTIVES

A. Content Standards

- The learners should have knowledge and understanding of the evaluation of algebraic expressions following substitution.

B. Performance Standards

- The learners are able to substitute into an algebraic expression to evaluate the expression.

C. Learning Competencies /Objectives

- The learner evaluates algebraic expressions for given values of the variables. [M7AL-IIc-4]

At the end of the lesson, the students should be able to:
a. Evaluate algebraic expressions for given values of the variables
b. Apply the correct order of operations (PEMDAS) when evaluating algebraic expressions involving multiple operations.
c. Solve real life problems involving algebraic expressions

II. CONTENT

- Evaluating Algebraic Expressions

III. LEARNING RESOURCES

A. References

1. Teacher's Guide Pages:Grade 7 Mathematics Teachers Guide | PDF | Algebra |Mathematics
2. Learner's Material Pages: Module
3. Textbook Pages: Math Counts Textbook, pp. 259 - 264
4. Additional Materials from Learning Resource (LR): https://mathmonks.com/algebraic-expression/evaluating-algebraic-expressions

B. Other Learning Resources

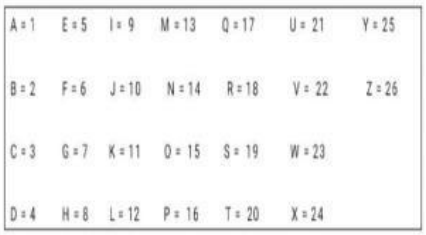
Laptop	Powerpoint Presentation
Marker	Visual Aids
Eraser	Kahoot
Board	

LIVEWORKSHEETS

IV. PROCEDURES

	TEACHER'S ACTIVITY	STUDENTS' ACTIVITY
Preliminary Activity	"Class, please stand as we begin our interfaith prayer" "Good morning/afternoon" "Before you take your seat, please pick those pieces of plastic and paper under your chair, and also arrange your chair." "You may now take your seats." "Checking of attendance" "Ms./Mr. Secretary, is there any absent today?" "Very good! Always maintain your hundred percent attendance, class	"The students begin the interfaith prayer." "Good morning/afternoon" (students will pick those scattered pieces of plastic and paper under their chair) (The student's will sit) None sir (may vary)
A. Reviewing previous lesson or presenting the new lesson	"So class, can anyone recall what was our lesson all about last meeting?" "Okay Very Good" "Based on your understanding last meeting, what do you think is Algebraic Expression." "Very well said" "who can give me an examples of Algebraic Expression" "Okay very good"	"Sir! The lesson yesterday was about Algebraic Expression." "Sir! An algebraic expression is a mathematical statement that contains a combination of numbers, symbols, variables and mathematical operators." "The student's give an example of algebraic expression"
B. Establishing a purpose for the lesson	"For now, before we proceed to our lesson, let's have a short activity first." **Direction:** Find the equivalent value of the given words by substituting the numerical value above to each letter of the word and adding all the numerical digits.	

LIVEWORKSHEETS

	Let:  For example: O M E G A 15+13+5+7+1 = 41 Is that clear? **Find the Numerical Value of the word** VALUE VARIABLES EVALUATE	Yes sir! Expected answer's V A L U E 22+1+12+21+5 = 61 V A R I A B L E S 22+1+18+9+1+2+12+5+19 = 89 E V A L U A T E 5+22+1+12+21+1+2O+5 = 87
C. Presenting examples/ instances	What happens if we replace variables with numbers? "Now, let's try solving some algebraic expression so you can see how substitution works" Example: 3a + 4 when a = 2 substitute 2 for a 3(2) + 4 use the order of operation = 6 + 4 = 10 So when a = 2 the algebraic expression 3a + 4 = 10 This is how we evaluate an algebraic expression by substitution	Sir, when we replace variables with numbers, we're performing a process called substitution.
D. Discussing new concepts and practicing new skills #1	Our lesson for today is evaluating algebraic expression. But before that, I will present to you the learning objectives. Everyone please read.	**Learning Objectives** At the end of the lesson, the students should be able to: a. Evaluate algebraic expressions for given values of the variables b. Apply the correct order of operations when evaluating algebraic expressions involving multiple operations. c. Solve real life

LIVEWORKSHEETS

	.	problems involving algebraic expressions
	Evaluating Algebraic Expressions means replacing the variables in an expression with their given values and then simplifying the expression to find the result. It follows the rules of basic arithmetic and the order of operations (PEMDAS: Parentheses, Exponents, Multiplication/Division, Addition/Subtraction).	
	"What does PEMDAS stands for?	Parenthesis, Exponent, Multiplication, Division, Addition, and Subtraction
	For example, we are to evaluate the algebraic expression $10x + 7y$, for $x = 2$ and $y=3$	
	Who wants to try? Yes, Mr./Ms. (name of the student)	$10x + 7y$ $= 10(2) + 7(3)$ $= 20 + 21$ $= 41$
	Very Good! Thus, the given expression $10x + 7y$ is evaluated to 41, when x = 2 and y = 3.	
	How about this one. $4s^2$-s +3 when s = 5 Who wants to solve	
	Yes, Mr./Ms.(student's name)	$4s^2$- s +3 $= 4(5)^2 - 5 + 3$ $= 4(25) - 5 + 3$ $= 100 - 5 +3$ $= 95 + 3$ $= 98$
	Try to solve this one Evaluate: $\frac{a + 3bc}{a^2}$ when a = 2, b = 1, c = 6 substitute 2 for a, 1 for b, and 6 for c in the given expression. (called for someone)	$\frac{a + 3bc}{a^2}$ $=\frac{2+3(1)(6)}{2^2}$ $=\frac{2+18}{4}$

LIVEWORKSHEETS

		$=\frac{20}{4}$ $= 5$
E. Discussing new concepts and practicing new skills #2	So, when we know how to evaluate algebraic expression, we can also answer questions about real-life situations that can be modeled by mathematical equations. Right? So, okay class try solve this **For example:** Maria goes to the mall to buy some clothes. Each shirt costs ₱250 and each pair of jeans costs ₱800. She also pays a fixed entrance fee of ₱50 for the fitting lounge. If Maria buys 2 shirts and 1 pair of jeans, what is the total amount she will spend? Another example: At the local market, apples cost ₱120 per kilo, while mangoes cost ₱80 per kilo. find the total cost when a customer buys 2 kilograms of apples and 3 kilograms of mangoes.	Yes sir! "Student's solution" Total Cost =250s+800j+50 Where: s = 2 j = 1 Substitute s = 2 and j = 1 in the expression 250s+800j+50 = 250(2) + 800(1) + 50 = 500 + 800 + 50 = 1350 If Maria buys 2 shirts and 1 pair of jeans She will spend ₱1350 Solution: 120a + 80m Where: a = 2 and m = 3 Substitute a = 2 and m = 3 in the

LIVEWORKSHEETS

	Okay very good "Now that you have learned how to evaluate algebraic expressions and how they apply to real-life situations, We will test your skills through an activity.	expression 120a + 80m 120a + 80m = 120(2) + 80(3) = 240 + 240 = 480 If the customer buys 2kg. of apples and 3kg. of mangoes, the total cost is ₱480.
F. Developing mastery (Leads to Formative Assessment 2)	**ACTIVITY** "SOLVE IT FAST" **Mechanics:** • Divide the class into 4 groups. • Each group uses one device to join the Kahoot game. • Teacher launches the Kahoot quiz and displays expression/questions on the screen • Groups discuss quickly among themselves before selecting the answer on their device. • Points are awarded based on accuracy and speed. • The group with the highest total score at the end wins. 1. Evaluating 2x + 3 when x = 4 gives 11 2. If a = 3 and b = 2, then 2a + 4b = 9 3. For x = 5 and y = 2, then x^2+ y = 27 4. When m = 4 and n = 3, then mn + 2 = 15. 5. Evaluating 4(x + 2) when x = 5 gives 28 6. Evaluate: 4x + 5y when x = 5 and y = 3 7. Evaluate: 3a + 2b - 6	Expected answers of the students on this activity 1.T 2.F 3.T 4.F 5.T 6. 35 7. 10 8. 16 9. 3 10. 5 11. 16 12. 10 13. 145 14. 15 15. 4

LIVEWORKSHEETS

	when a = 4 and b = 2 8. Evaluate: 2m + 2n - 2 when m = 5 and n = 4 9. Evaluate: 2ab - 3b when a = 2 and b = 3 10. Evaluate: $\frac{ab-b}{b}$ when a = 6 and b = 5 11. Evaluate: $2a^2 - 3b + 4$ when a = 3 and b = 2 12. Evaluate: $\frac{2m+n}{n-2}$ when m = 8 and n = 4 13. Evaluate: $5(x^2 + 4)$ when x = 5 14. Evaluate: $a^2 + b^2 - 2c$ when a = 3, b = 4 and c = 5 15. Evaluate: $\frac{2m+4n}{m+1}$ when m = 4 and n = 3 "Now that you've mastered evaluating algebraic expressions, let's take it one step further. Let's see how this skill is used in real-life situations that you might encounter every day. "	
G. Finding practical applications of concepts and skills in daily living	Cupcakes at the Pink Bakeshop are sold at ₱35.00 per piece. Every transaction comes with a fixed charge of ₱6.00 for the box and napkins. One box can hold up to a dozen cupcakes. Rita bought 12 cupcakes for her mother's birthday. How much change will she get if she paid ₱1,000.00 for her transaction? Let n = number of cupcakes bought in one transaction. So, the amount of n cupcakes bought is $35n$ But there is an additional fixed price of ₱6.00. Therefore, the total amount to be paid for a transaction is determined using the following equation 35n + 6	

LIVEWORKSHEETS

	"Right?" If Rita bought 12 cupcakes, then n = 12 "What is the solution?" "Our solution is not yet complete right?" If Rita paid ₱1,000 for her transaction, then 1,000 - 426 = 574 Therefore, Rita will receive a change of ₱574.00 "To answer a real-life problem involving algebraic expression, the first step is to analyze the problem, next is to find the given, write an algebraic expression, then evaluate." "Is that clear?" "Very Good"	"Yes sir!" Solution: 35n +6 when n = 12 = 35(12) + 6 = 426 The total amount to be paid is ₱426.00 Yes sir! Subtract 426 in 1,000 Answer of the students ₱574 Yes sir!
H. Making generalizations and abstractions about the lesson	Guide Question: 1. How do we evaluate algebraic expressions? Enumerate the steps. 2. How do we apply evaluating algebraic expressions in real-life? Class any questions, clarification about our lesson for today?	The students will answer "Substitute and evaluate, following the order of operation" "Parenthesis, Exponent, Multiplication, Division, Addition, Subtraction" "Analyze, find the given, write an algebraic expression, then Evaluate" None sir! (may vary)
I. Evaluating learning	**Quiz (1 whole sheet of paper)** **Direction:** Evaluate the following Algebraic Expressions. Carefully read each algebraic expression and the values provided for the variables.Substitute the given values into the expression. Write your final answer clearly. **Evaluate:** 1. $\frac{4m+3n}{2(m-1)}$ when m = 5 and n = 4 **2.** $5x^2 + 3xy$ When x = 2 and y = 3	Students will answer the quiz Expected answers of the students **1. 4** **2. 38** **3. 5**

LIVEWORKSHEETS

	3. $\frac{2x+3}{4y-5}$ When x = 6 and y = 2 4. $3a^2 + 2b^2 - 5$ when a = 2 and b = 3 5. $\frac{2x^2-x}{3x}$ When x = 5 6. $2(w^2 + 3)$ When w = 5 7. 5m - 4n -5 when m = 5 and n = 3 8. A student's final grade in math is determined using three components; 40% for quizzes, 30% for performance tasks and 30% for the quarterly exam. Find the student's final grade if the quiz average is 87, performance tasks average is 92, and exam score is 85. 9. A household's monthly water bill includes a fixed service charge of ₱150, ₱12 per cubic meter for regular water usage and ₱15 per cubic meter for excess usage. compute the water bill if the household used 11 cubic meters of regular water and 4 cubic meters of excess water. 10. During the Foundation Day celebration, the school sold tickets for the mini-concert. Child tickets cost ₱20 each, while adult tickets cost ₱35 each. What is the total sales for 18 child tickets and 12 adult tickets.	**4. 25** **5. 3** **6. 56** **7. 8** **8. 87.9** **9. ₱342** **10. ₱780**
J. Additional activities for application	Assignment: (1 whole sheet of paper) Direction: Evaluate the following algebraic expression using the given values. Write your answers and solutions in 1 whole sheet of paper. 1. $3x^2$ + 5y -4 when x = 5 and y = 4 2. $\frac{3a^2-2ab}{a-b}$ When a = 4 and b = 2 3. $\frac{x^2+y^2}{x-2}$ when x = 5 and y = 4 4. $\frac{3x^3-2y}{x-y}$ when x = 3 and y = 2	"Take Note"

LIVEWORKSHEETS

	5. $\frac{2m^2 - n^2}{mn}$ When m = -2 and n = 4 6. $5x + 2x^3$ when x = 4 7. 3x - 7x when x = -1 8. $5(a^2 + 4)$ when a = 4 9. Every week, Anna saves money. She sets aside a fixed amount, earns an extra ₱20 for doing chores, and gets ₱10 for every recyclable bottle she turns in. Determine her total savings if she saves ₱100 as her fixed amount and collects 8 bottles. 10. A class is making a mural and needs to buy materials. Paint costs ₱95 per bottle and brushes cost ₱15 each. Find the total cost when the class buys 4 bottles of paint and 10 brushes.	

Prepared by:

MARLEX A. OMEGA BSED MATH 3
(Signature Over Printed Name)

LIVEWORKSHEETS