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Lesson Exemplar for Mathematics

Quarter 4

Lesson

1

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Lesson Exemplar for Mathematics Grade 7
Quarter 4: Lesson 2 (Week 2)
SY 2024-2025

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MATHEMATICS/QUARTER 4/ GRADE 7

I. CURRICULUM CONTENT, STANDARDS, AND LESSON COMPETENCIES	
A. Content Standards	The learners should have knowledge and understanding of the solution of simple equations
B. Performance Standards	By the end of the lesson, the learners can solve simple equations. and substitute it into an algebraic expression to evaluate the expression.
C. Learning Competencies and Objectives	<i>The learners can:</i> 1. Distinguish a variable from a constant in an algebraic expression. 2. Translate verbal phrases into algebraic expressions. 3. Evaluate algebraic expressions given the value/s of the variables.
D. Content	Algebraic Expression (Weeks 1 & 2)
E. Integration	

II. LEARNING RESOURCES
CK-12 Foundation. (2024, January 11). <i>Evaluating algebraic expressions and equations</i>. https://flexbooks.ck12.org/cbook/ck-12-algebra-ii-with-trigonometry-concepts/section/1.4/primary/lesson/evaluating-algebraic-expressions-and-equations-alg-ii/ Department of Education. (2020). <i>Mathematics quarter 2 – module 4: algebraic expressions</i>. (1). Khan Academy. (2015, September 12). <i>What are terms, factors, and coefficients in algebraic expressions?</i> [Video]. YouTube. https://www.youtube.com/watch?v=9_VCk9tWT0Y Miacademy Learning Channel. (2021, March 31). <i>Let's learn about terms, factors, & coefficients</i> [Video]. YouTube. https://www.youtube.com/watch?v=pdTmDdKg554 Miacademy Learning Channel. (2021, April 24). <i>What's a variable?</i> YouTube. https://www.youtube.com/watch?v=70-qzr3x6Ys

III. TEACHING AND LEARNING PROCEDURE	NOTES TO TEACHERS
A. Activating Prior Knowledge DAY 1 1. Short Review Provide students with a list of verbal phrases and ask them to translate each into an algebraic expression. Example phrases: "Four more than twice a number"	Have students pair up to compare their translations, discuss any discrepancies, and help each other

	"The difference between a number and three" "Five times the sum of a number and two" "The product of a number and nine, decreased by six" "The ratio of a number and four, minus seven" 2. Feedback (Optional) Like how your facial expression can convey your emotions, a mathematical expression illustrates the value of the variables provided.	understand the correct translations.
B. Establishing Lesson Purpose	1. Lesson Purpose Hook: Start with a real-life problem that can be modeled by an algebraic expression. For example, "If you earn Php10 per hour and work h hours, how much do you earn in total?" Introduce the expression $10h$. 2. Unlocking Content Vocabulary Match the non-math definition to the words related to the lesson 1. Refers to replacing one player on the court with another from the team's bench. 2. Means carefully looking at something, thinking about it, and deciding its value or importance. 3. The act of including or combining something with another to make it larger or more complete. 4. In a painting, artists sometimes scrape off paint or cover parts of the canvas to create negative space or draw attention to specific elements. 5. Reproducing or creating additional instances or versions of something to increase availability, distribution, or impact. Choices: Addition, Multiplication Subtraction, Substitution, Evaluate	Explain the lesson's purpose and what students are expected to achieve by the end. The students will connect real-world definitions of a term to the words related to the lesson. Answers: 1. Substitution 2. Evaluate 3. Addition 4. Subtraction 5. Multiplication
C. Developing and Deepening Understanding	SUB-TOPIC 1: Evaluating Algebraic Expressions and its Applications. 1. Explication To evaluate algebraic expressions, replace the given values for the variables and then simplify the resulting numerical expressions. Steps to follow in evaluating algebraic expressions: 1. Substitute the given values for each variable. 2. Simplify first the expression within the parenthesis. 3. Perform all indicated operations and simplify the result.	

2. Worked Example

Example no. 1

Evaluate $a+7$ when:

1. $a=3$
2. $a=12$

1. To evaluate, substitute 3 for a in the expression, and then simplify.

$a+7$
Substitute. $3+7$
Add. 10
When $a=3$, the expression $a+7$ has a value of 10.

2. To evaluate, substitute 12 for a in the expression, and then simplify.

$a+7$
Substitute. $12+7$
Add. 19
When $a=12$, the expression $a+7$ has a value of 19.

Example no. 2

Evaluate $9x-2$, when

1. $x=5$
2. $x=1$

Solution:

Remember ab means a times b , so $9x$ means 9 times x .

1. To evaluate the expression when $x=5$, we substitute 5 for x , and then simplify.

$9x-2$
Substitute $9(5) - 2$
Multiply. $45-2$
Subtract 43

2. To evaluate the expression when $x=1$, we substitute 1 for x , and then simplify.

$9x-2$
Substitute $9(1) - 2$
Multiply. $9-2$
Subtract 7

Let the students remember the activity on getting the value of their Names. Using $A= 1$, $B= 2$, $C= 3$ up to $Z= 26$.

Notice that we got different results for parts (1) and (2) even though we started with the same expression. This is because the values used for a were different. When we evaluate an expression, the value varies depending on the value used for the variable.

Notice that in (1) we wrote $9(5)$ and in (2) wrote $9(1)$. Both the dot and the parentheses tell us to multiply.

Example no. 3

Evaluate x^2 when $x=10$.

Solution: We substitute 10 for x , and then simplify the expression.

	x^2
Substitute 10 for x	10^2
Use the definition of exponent.	10×10
Multiply.	100
When $x=10$, the expression x^2 has a value of 100.	

Example no. 4

Evaluate $\frac{x}{2}$ when $x=10$.

Solution: We substitute 10 for x , and then simplify the expression.

	$\frac{10}{2}$
Substitute 10 for x	$\frac{10}{2}$
Since it's a fraction, we divide it.	$10 \text{ divided by } 2$
Divide	5
When $x=10$, the expression $\frac{x}{2}$ has a value of 5	

Example no. 5

Evaluate $2x^2-1$ when $x=2$.

Solution: We substitute 2 for x , and then simplify the expression.

Substitute 2 for x	$2(2)^2-1$
Use GEMDAS	$2(4) - 1$
Simplify	$8-1$
	7

When $x=2$, the expression $2x^2-1$ has a value of 7.

DAY 2**Word Problems/Rela Life Problems****Example no. 1**

Problem: The total profit from selling x units of a product is given by $20x-200$ pesos. Evaluate the total revenue when 15 units of the product are sold.

Given: $x=15$

Evaluation: P for x units sold = $20x - 200$
 P for 15 units sold = $20(15) - 200$
 P for 15 units sold = $3000 - 200$
 P for 15 units sold = Php 2800

Incorporating real-life examples can engage students and help them relate algebraic concepts to their everyday experiences.

Example no. 2

A catering company charges a fixed fee of Php 2500 for an event, plus Php 100 per person for catering services. If 50 guests are attending the event, how much will the total bill be for catering?

Total bill for catering:

Fixed fee for the event: ₱2 500

Cost per person for catering: ₱100

Number of guests: 50

Total catering cost: ₱2 500 (fixed fee) + (50 guests × ₱100/guest) =
₱2 500 + ₱5 000 = ₱7 500

Therefore, the total bill for catering for 50 guests would be ₱7 500.

Example no. 3

The total distance traveled by a car is given by the formula $50t + 100$, where t represents the time in hours. Evaluate the total distance traveled when the car has been driving for 3 hours.

Given: $t=3$

Evaluation:

Distance for t hours $50t+100$

Substitute $t=3$ $50(3)+100$

Simplify $150+100$

Distance for 3 hours = 250 miles

Example no. 4

The temperature of an oven increases by 20 degrees Celsius every hour. If it started at 100 degrees Celsius, evaluate its temperature after 2 hours. Given: The initial temperature is 100 degrees Celsius.

Evaluation:

- Temperature increase per hour = $100 + 20x$ degrees Celsius

Substitute the value of hours $= 100+(20 \times 2)$

Multiply $= 100+40$

- Temperature after 2 hours = 140degrees Celsius

You may choose other problems based on the students' abilities.

Example no. 5

A pizza restaurant charges ₱10 for each topping added to a pizza. Evaluate the total cost of a pizza with 4 additional toppings.

Given: Each topping costs ₱10.

Evaluation:

Cost for each topping = ₱10x

Substitute = ₱10 × 4

Total cost for 4 additional toppings = ₱40

DAY 3**3. Lesson Activity****Activity:**

1. Spin the spinner or draw a card to determine the value of a variable.
2. Use the given value to evaluate the algebraic expression.
3. Write down your answer.
4. Repeat for each algebraic expression.
5. Have fun twisting and evaluating!

Worksheet:

Spinner Results: $x=3$

1. $2x+5$ Answer: _____
2. $3x-2$ Answer: _____
3. $4x^2+2x-3$ Answer: _____
4. $5x+10$ Answer: _____
5. $7x^2+3x+7$ Answer: _____

Spinner Results: $x=6$

6. $3x-4$ Answer: _____
7. $12x^2+5x+1$ Answer: _____
8. $4x+3$ Answer: _____
9. x^2-2x+5 Answer: _____
10. $6x+8$ Answer: _____

Activity:

Instructions: Evaluate each algebraic expression by substituting the given values for the variables.

1. Evaluate the expression $2x+3$ when $x=4$.
2. Find the value of the expression $25y-2$ when $y=6$.

Note: Use a spinner or cards with values for the variable x to add a twist to the worksheet activity. You can also encourage students to create their spinners or cards for more variety.

Answer Key:

1. $2(3)+5$
 $6+5=11$
2. $3(3)-2$
 $9-2=7$
3. $4(3)^2+2(3)-3$
 $4(9)+6-3$
 $36+6-3$
 $42-3=39$
4. $5(3)+10$
 $15+10=25$
5. $7(3)^2+3(3)+7$
 $7(9)+9+7$
 $63+9+7$
 $72+7=79$
6. $3(6)-4$
 $18-4=14$
7. $12(6)^2+5(6)+1$
 $12(36)+30+1$
 $432+30+1$
 $462+1=463$
8. $4(6)+3$
 $24+3=27$
9. $(6)^2-2(6)+5$
 $36-12+5$
 $24+5=29$
10. $6(6)+8$
 $36+8=44$

	3. Determine the result of the expression $3z^2+2z-1$ when $z=2$. 4. Evaluate the expression $3a+2$ when $a=5$. 5. Calculate the value of the expression $4b+7$ when $b=2$. Word Problem 6. A cleaning service charges a fixed fee of PHP 1500 for a one-time cleaning session, plus PHP 200 per hour for additional cleaning time. If the cleaning session lasts for 4 hours, what will the total cost be? 7. A taxi company charges PHP 50 as a base fare for a ride, plus PHP 10 for every kilometer traveled. If the ride covers a distance of 8 kilometers, what will be the total fare? 8. A fitness trainer charges PHP 300 per session for personal training sessions, plus an additional PHP 50 for the use of equipment. What will be the total cost if a client schedules 3 sessions and uses equipment for 2 of them? 9. A movie theater charges PHP 200 for a movie ticket and an additional PHP 50 for a large popcorn. What will be the total cost if a person buys 2 tickets and 1 large popcorn? 10. A music streaming service charges a monthly subscription fee of PHP 150 and an additional PHP 50 for a family plan upgrade. If someone subscribes to the family plan for 3 months, what will be the total cost?	Answer Key: I. $2(4)+3=8+3=11$ $5(6)-2=30-2=28$ $3(2)+2(2)-1=3(4)+4-1=12+4-1=15$ $3(5)+2=15+2=17$ $4(2)+7=8+7=15$ II. - Total cost = Php 1500 (fixed fee) + Php 200/hour $\times$ 4 hours = PHP 2300 - Total fare = Php 50 (base fare) + Php 10/km $\times$ 8 km = Php 130 - Total cost = Php 300 (per session) $\times$ 3 sessions + PHP 50 (equipment fee) $\times$ 2 sessions = Php 950 - Total cost = Php 200 (2 movie tickets) + PHP 50 (large popcorn) = PHP 450 - Total cost = PHP 150 (monthly subscription fee) + PHP 50 (family plan upgrade) $\times$ 3 months = PHP 300
D. Making Generalizations	1. Learners' Takeaways Generalization Questions: Sub-topic 1: - What steps do you follow to evaluate an algebraic expression with given variable values? - Which aspect of evaluating algebraic expressions do you find challenging?	

2. Reflection on Learning

After completing the exercises, use this checklist to evaluate your mastery of the objectives of this section.

I can	Confidently	With some Help	No, I didn't get it
Evaluate Algebraic Expressions			

IV. EVALUATING LEARNING: FORMATIVE ASSESSMENT AND TEACHER'S REFLECTION**NOTES TO TEACHERS****A. Evaluating Learning****DAY 4****1. Formative Assessment**

I. Multiple Choice. Choose the correct answer.

1. Evaluate the expression $2x+3$ when $x=4$.

- A) 8 C) 14
B) 11 D) 17

2. If $y=5$, what is the value of the expression $3y-2$?

- A) 13 C) 17
B) 15 D) 19

3. What is the value of $4a+7$ when $a=3$?

- A) 15 C) 21
B) 19 D) 25

4. If $x=2$, what is the result of $3x^2-5x+1$?

- A) 2 C) 4
B) 3 D) 5

5. Evaluate the expression $2b-3$ when $b=6$.

- A) 9 C) 15
B) 12 D) 18

6. If $c=4$, what is the value of c^2+2c ?

- A) 20 C) 32
B) 24 D) 40

Answer:

I.

1. B) 11
2. A) 13
3. B) 19
4. C) 4
5. C) 15
6. B) 24
7. C) 30
8. C) 37
9. D) 39
10. C) 23

II.

Total earnings = Fixed rate +
Hourly rate * Time taken
Total earnings = $520+200 * 3$
Total earnings = $520 + 600$
Total earnings = 1, 120 pesos

	7. What is the result of $6x-4$ when $x=5$? A) 22 C) 30 B) 26 D) 34 8. If $y=3$, what is $2y^2+5$? A) 23 C) 37 B) 31 D) 47 9. Evaluate the expression $5a-2$ when $a=7$. A) 33 C) 37 B) 35 D) 39 10. If $x=3$, what is the value of x^3-2x+4? A) 19 C) 23 B) 21 D) 25 II. Problem Solving. Solve the problem below. Show your solution. Your summer landscaping job pays a fixed rate of P520 per job plus P200 an hour. How much total money you would make if it took you 3 hours to complete a single job? 2. Homework (Optional)			
B. Teacher's Remarks	<i>Note observations on any of the following areas:</i>	Effective Practices	Problems Encountered	The teacher may take note of some observations related to the effective practices and problems encountered after utilizing the different strategies, materials used, learner engagement, and other related stuff. Teachers may also suggest ways to improve the different activities explored/lesson exemplar.
	strategies explored			
	materials used			
	learner engagement/ interaction			
	others			

C. Teacher's Reflection	<i>Reflection guide or prompt can be on:</i> • <u>principles behind the teaching</u> <i>What principles and beliefs informed my lesson?</i> <i>Why did I teach the lesson the way I did?</i> • <u>students</u> <i>What roles did my students play in my lesson?</i> <i>What did my students learn? How did they learn?</i> • <u>ways forward</u> <i>What could I have done differently?</i> <i>What can I explore in the next lesson?</i>	Teacher's reflection in every lesson conducted/facilitated is essential and necessary to improve practice. You may also consider this as an input for the LAC/Collab sessions.
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