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ALMS8

TAILORED LEARNING, PERSONALIZED PROGRESS

SUPPLEMENTARY MODULE 3

Model Real-Life Situations Using Algebraic Expressions

GRADE 8

🌐 **m a l m s 8 . o n l i n e**

HEY THERE, AMAZING LEARNER!

If you're here, it means you're on the path to mastering the art of modeling real-life situations using algebraic expressions – and that's awesome! If you're feeling a bit overwhelmed or struggling to keep up, don't worry at all. Everyone learns at their own pace. In this supplementary session, we'll take a step back, revisit some key concepts, and work together to strengthen your understanding. Remember, every challenge is an opportunity to grow!

LEARNING OBJECTIVES

① Identify key variables and relationships with increased clarity

② Enhance their procedural skills in constructing and adjusting algebraic models

③ Demonstrate improved comprehension and retention of algebraic modeling concepts by engaging in additional practice problems

We understand that translating real-life situations into algebraic expressions can be challenging. Let's break down the process and address common difficulties:

Identifying Key Elements:

● **Quantities:** Instead of memorizing "quantities are numerical values," think of them as things you can count or measure. What are you trying to find (unknown), and what information do you have about it (known quantities)?

● **Relationships:** Don't get hung up on fancy terms like "addition" or "multiplication." Think of these as actions done to the known quantities. How are they connected? Is something incre asing, decreasing, or staying the same?

● **Unknown:** This is the mystery you want to solve. What question are you trying to answer with the expression?
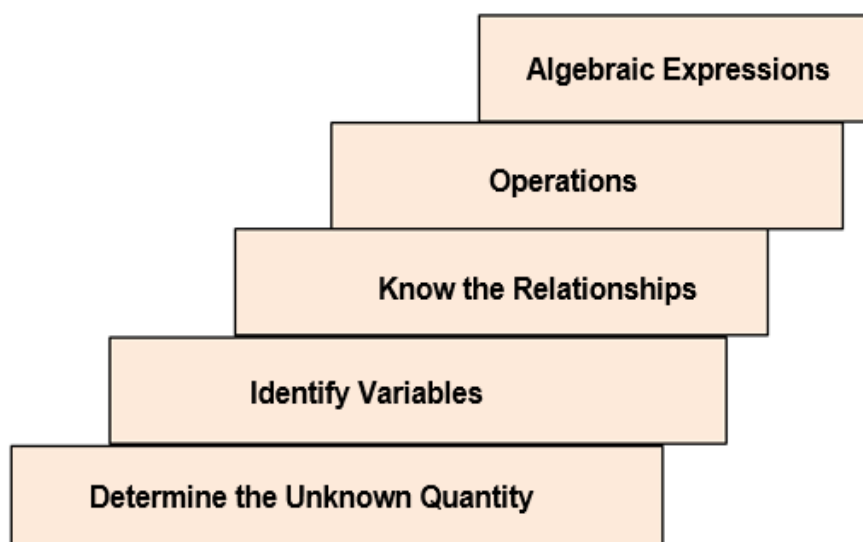
Translating to Expressions:

● **Start simple**: Don't jump straight to complex formulas. Break down the scenario into smaller steps. What's happening to each known quantity?
● **Focus on variables:** Remember, they represent the unknown or changing values. Give them meaningful names related to the scenario (e.g., "cookies" instead of "x").
● **Use clear operations:** Don't be afraid to write out "plus," "minus," "times," or "divided by" instead of symbols. This clarifies your thinking.

Step-by-Step Guide to Constructing Algebraic Model

Scenario: A local bakery sells cupcakes for PHP 20.00 each. They offer free delivery for orders within a 3-mile radius. For each additional mile beyond the initial 3 miles, there is a delivery charge of PHP10.00. Write an algebraic expression to represent the total cost of ordering cupcakes from this bakery.

Remember the steps!

Algebraic Expressions

Operations

Know the Relationships

Identify Variables

Determine the Unknown Quantity

Unknown Quantity	Total cost of ordering cupcakes from the bakery.
Variables	Let C represent the number of cupcakes ordered. Let F represent the delivery fee if applies Let D represent the distance of delivery in miles
Relationships	The cost of cupcakes depends on the number ordered. The delivery charge depends on the distance of delivery.
Operations	Multiplication: To calculate the cost of cupcakes based on the number ordered. Addition: To include the delivery fee based on the distance.
Algebraic Expressions	Cost of Cupcakes + Delivery Fee **20C+F** *To calculate the delivery fee:* • *If D≤3: Delivery fee= (free delivery)* • *If D>3: Delivery fee=10×(D−3)* *20C represents the cost of the cupcakes based on the number ordered. The delivery fee is dependent on the distance of delivery. If the distance is less than or equal to 3 miles, there is no delivery charge. If the distance exceeds 3 miles, a delivery charge is incurred for each additional mile beyond the initial 3 miles.*

To further understand how modeling real life situations using algebraic expression helps in solving a problem, let's have a particular example:

Let's say a customer orders 10 cupcakes and wants them delivered 5 miles away. Find the total cost of ordering cupcakes from the bakery.

- C=10 cupcakes

- D=5 miles

Using the algebraic expressions:

20C + F
20 (10) + F

To calculate the delivery fee:
- *If D≤3: Delivery fee= (free delivery)*
- *If D>3: Delivery fee=10×(D−3)*

If we get the equation for finding the total cost (T) of ordering cupcakes, considering that D=5 it will be:

T= 20 (10) + 10(5-3)
T= 200 + 10(2)
T= 200 +20
T= 220

In conclusion, if the customer ordered 10 cupcakes from the bakery and wants them delivered 5 miles away, the total cost would be PHP 220.00.
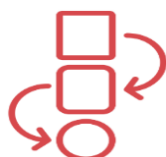
Common Challenges:

Missing Information: Not everything is given. Look for clues or make reasonable assumptions based on the context. Can you estimate or research missing values?

Multiple Expressions: Sometimes, different ways to write the expression are va lid. Explore alternative approaches, but make sure they capture the same relationships.

Complex Situations: Break them down! Think in steps, identify sub-problems, and model each part separately before combining them