ALMS8

TAILORED LEARNING, PERSONALIZED PROGRESS

# LEARNING MODULE 3

## Model Real-Life Situations Using Algebraic Expressions

**GRADE 8**

# 2 MODEL REAL-LIFE SITUATIONS USING ALGEBRAIC EXPRESSIONS

## WELCOME, GRADE 8 LEARNERS!

Welcome to our exciting journey into the world of algebraic expressions and real-life scenarios. In this course, we'll dive into the magic of algebra, where we'll learn how to use expressions to model and solve everyday situations. Get ready to unleash your creativity as we tackle problems, unlock solutions, and see how math comes alive in the real world!

## LEARNING OBJECTIVES

1. Analyze the relationships between variables and constants within the context of different situations.
2. Model real-life situations using algebraic expressions
3. Develop a sense of confidence and competence in translating real-world situations into mathematical representations.

Let's begin by remembering that modeling real-life situations with algebraic expressions entails converting real-world problems into mathematical equations or formulas. This process enables us to depict and examine connections between different factors and anticipate potential outcomes in different scenarios, by considering **word problems** that describe real-life scenarios. ***Can you identify the key elements involved?***

*Often, we have:*

- ***Quantities:*** *These are the numerical values we're interested in, like age, distance, price, etc.*
- ***Relationships:*** *These describe how the quantities interact, like addition, subtraction, multiplication, or division.*
- ***Unknown:*** *This is the quantity we're trying to find, represented by a variable (e.g., x, y, z).*

*The challenge lies in translating these elements into an* ***algebraic expression****.*

***For example, imagine:***

John has 5 apples, and Sarah has twice as many. How many apples do they have in total?

*Here, we have:*

- *Quantities: John's apples (5), Sarah's apples (unknown)*
- *Relationship: Sarah has twice John's apples (multiplication)*
- *Unknown: Total number of apples (John's + Sarah's). Let's denote x as the total number of apples.*
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*Translating this scenario into an expression, we get:*

| John has 5 Apples | Sarah has twice John's apples | Total Number of Apples (x) |
|---|---|---|
| 5 | 2(5) | x= 5+ 2(5) |

*Solving the working equation, we have:*

$$x = 5 + 2(5)$$
$$= 5 + 10$$
$$= 15.$$

***Hence, the total number of apples is 15.***

***We'll tackle various real-life problems and translate them into expressions:***

***Baking Cookies****:* You need 3 cups of flour for a batch of cookies*. If you want to make 4 batches, how much flour do you need?*

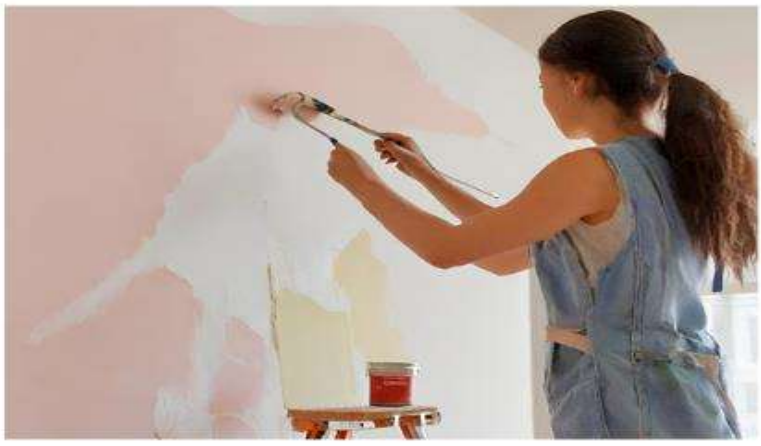
**Unknown Quantity**: Amount of flour needed for 4 batches.

**Variables:** F: Cups of flour per batch (given as 3 cups).

**Operations**: Multiplication to calculate total cups of flour needed.

**Algebraic Expression:** T= 3 * 4
where “T” represents the total cups of flour needed.

***Painting a Room:*** A gallon of paint covers 200 square feet. You have a room measuring 10 feet by 8 feet. *How many gallons of paint do you need?*



***Unknown Quantity****: Gallons of paint needed to cover the room.*

***Variables****:*

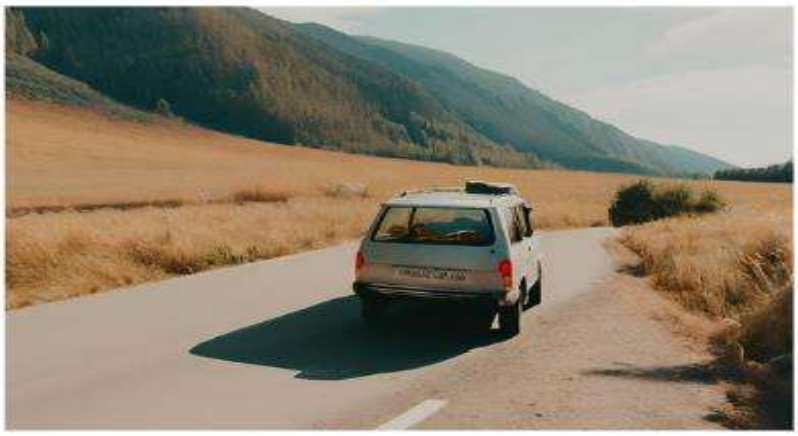
*P: Gallons of paint per 200 square feet (given as 1 gallon).*

*A: Area of the room (given as 10 feet by 8 feet).*

***Operations****: Division to calculate the number of gallons needed.*

**Algebraic Expression:** G = (A/200) * P
where “G” represents the gallons of paint needed.

***Travel Time:*** You travel 70 miles per hour, and you want to reach a destination 420 miles away. *How many hours will it take?*



***Unknown Quantity****: Time (in hours) to reach the destination.*

***Variables****:*

*S : Speed of travel (given as 70 miles per hour).*

*D : Distance to the destination (given as 420 miles).*

***Operations****: Division to calculate the time taken.*

**Algebraic Expression:** T = (D/S)
where "T" represents the time taken

***Remember, modeling real-life situations isn't always straightforward. Sometimes, you might need:***

***1. Additional information:*** *Not all details are explicitly given in the problem. Can you identify missing information and make reasonable assumptions?*

***2. Multiple expressions:*** *Depending on the context, different expressions might represent the same scenario. Can you explore alternative approaches?*