MALMS8

TAILORED LEARNING, PERSONALIZED PROGRESS

SUPPLEMENTARY MODULE 3

Model Real-Life Situations Using Algebraic Expressions

GRADE 8

malms8.online

1 MODEL REAL LIFE SITUATIONS USING ALGEBRAIC EXPRESSIONS

Welcome!

If you're finding some parts of our algebraic expressions journey a bit challenging, worry not – you're not alone! Our supplementary material is here to offer you some extra support and encouragement. This space is designed just for you, providing a bit more explanation, practice, and a whole lot of encouragement. Let's tackle this together and make algebraic expressions a piece of cake!

LEARNING OBJECTIVES

1. Recall the basic characteristics of fundamental algebraic expressions
2. Explain the steps involved in modeling real-life situations using algebraic expressions in simple terms.
3. Recognize examples of real-life scenarios represented by an algebraic expression.

Algebraic expressions are powerful mathematical tools used to represent relationships between quantities. In real-life scenarios, these expressions enable us to model various phenomena, from constant rates of change to variable trajectories and proportional relationships.

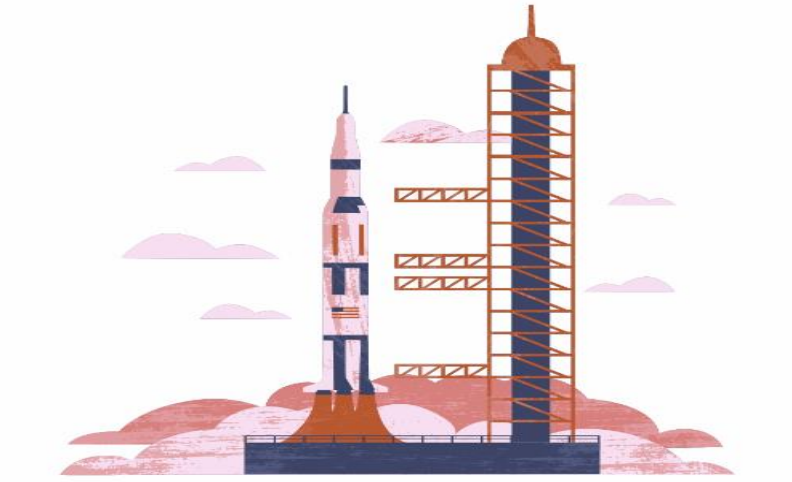
Here are some fundamental algebraic expressions commonly used in modeling real-life Situations:

Linear Expressions

- Represented as ***y=mx+b***, are utilized in scenarios where there is a constant rate of change.
- In the equation, *m* represents the slope of the line, indicating the rate of change, and *b* represents the y-intercept, the point where the line intersects the y-axis.
- **Example:** Modeling the cost of a taxi ride where there is a fixed initial fee (*b*) and a constant rate per mile (*m*).

Quadratic Expressions

- Represented as $y=ax^2+bx+c$, are employed in situations where there is a variable rate of change, often leading to a curved graph.
- In the equation, *a*, *b*, and *c* are constants that determine the shape and position of the quadratic curve.
- **Examples:** Modeling the trajectory of a projectile, such as a thrown ball or a launched rocket, where *x* represents time and *y* represents height.



Rational expressions

- Rational expressions are utilized in situations involving **ratios or rates**, often represented as **fractions.**
- **Examples**: Describing the ratio of ingredients in a recipe or the proportions of components in a mixture.

Review of English phrases keywords to determine what appropriate operation is to use in modeling real life situations:

Addition	Subtraction	Multiplication	Division	Exponent
the sum of	the difference of	the product of	the quotient of	square
added to	diminished by	multiplied by	divided by	cube
increased by	decreased by	of	all over	
plus	minus	times	ratio	
more than	subtracted from	twice	split into	
greater than	less than	thrice		
exceeds by	take away			
more	less			

Modeling real-life situations using algebraic expressions involves translating real-world problems into mathematical equations or formulas. This allows us to represent and analyze relationships between variables and make predictions about the outcome of various scenarios.

Identify the Problem	Recognize the real-world situation to model. Determine key variables involved.
Define Variables	Assign symbols (e.g., x, y, z) for unknown or changing quantities.
Identify Relationships	Express variable relationships using equations or formulas. Example: T = x * y + z * w for total cost.
Simplify Expressions	Combine like terms and simplify for clarity.

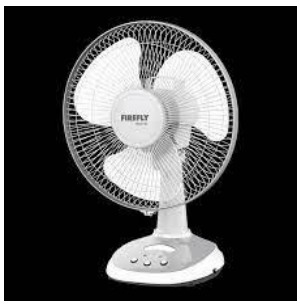
Use Expressions for Solutions	Substitute numerical values for variables. Example: If x=3, y=$2, z=2, w=$3, T = 3 * 2 + 2 * 3 = $9.
Interpret Results	Understand the real-world implications of solutions. Draw conclusions for informed decision-making.

Here are some examples of how algebraic expressions can be used to model real-life situations:

Algebraic Expressions in Real-Life Modeling:

Total Cost of Items:

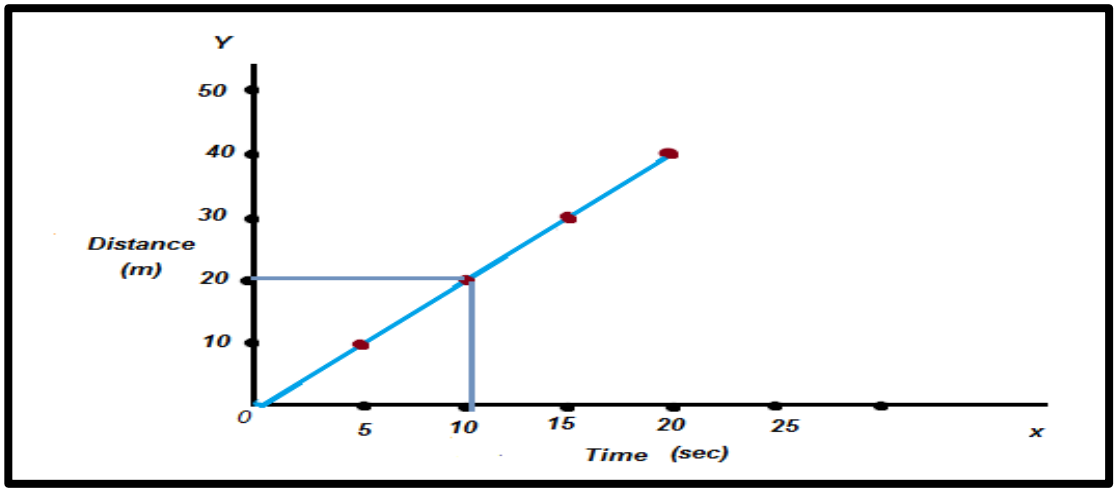
- Expression:
  - $T=2x+3y+5z$
- Variables:

		
X = # of Fan	**Y = # of Ballpen**	**X = # of Paper**

Interpretation: Coefficients represent prices; use quantities to calculate total cost.

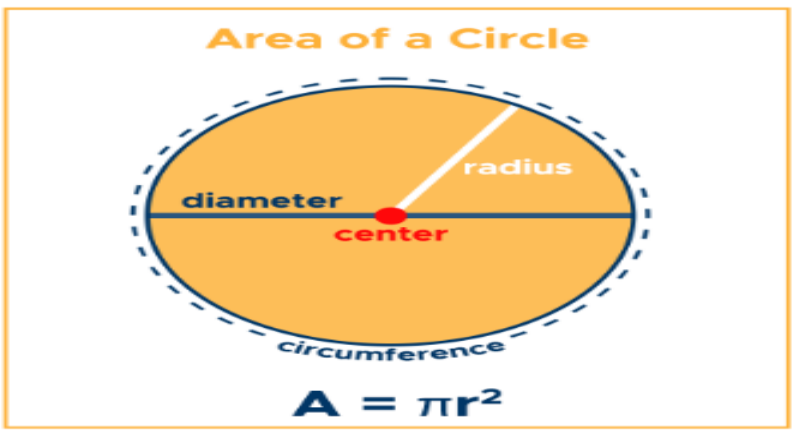
Distance Traveled:

- **Expression:**
  - $D=S\times T$
- Variables:
  - S = Speed,
  - T = Time



Interpretation: Multiply speed by time to determine total distance traveled.

Area of Shapes:



- **Circle Area:**
- $A=\pi r^2$

Interpretation: Use expressions to find perimeter and area in geometry.