

# Bright Horizons Academy

Grade 6: Mathematics

## Introduction to Algebraic Expressions

### Objective:

Students will *understand* that algebraic expressions use letters to represent unknown numbers and learn how to write, evaluate, and simplify simple expressions.

### Core Content:

An **algebraic expression** is a combination of numbers, letters (**variables**), and operations like addition, subtraction, multiplication, or division. Variables are *symbols* (usually letters) that stand for unknown numbers. For example:

In the expression  $3x + 5$ , the variable  $x$  can stand for different values.

### Key Points to Remember:

- **Simplifying Expressions:** Combine like terms.
  - Like terms are terms that have the same variable part (e.g.,  $2x$  and  $3x$  are like terms, but  $2x$  and  $3y$  are not).
- **Evaluating Expressions:** Replace the variable with a specific number and solve using order of operations (parentheses, exponents, multiplication/division, addition/subtraction).

**Why It's Important:** Learning to work with algebraic expressions helps you solve real-world problems, like figuring out unknown amounts in equations or patterns.

## Examples:

1. Simplify:

- a. Expression:  $2x + 3x$
- b. Step 1: Combine like terms ( $2x + 3x = 5x$ )
- c. Result:  $5x$

2. Simplify:

- a. Expression:  $4a + 7 - 2a$
- b. Step 1: Combine like terms ( $4a - 2a = 2a$ )
- c. Result:  $2a + 7$

3. Evaluate:

- a. Expression:  $2x + 1$ , where  $x = 3$
- b. Step 1: Substitute 3 for  $x$  ( $2(3) + 1$ )
- c. Step 2: Simplify:  $6 + 1 = 7$
- d. Result: 7

## Practice Questions:

Try these problems to practice simplifying and evaluating algebraic expressions.

- 1. Combine like terms:  $5y + 2y = ?$
- 2. Simplify:  $3x + 4 + 2x = ?$
- 3. If  $x = 2$ , what is  $4x + 3$ ?
- 4. If  $y = 5$ , evaluate  $2y + 6$

5. Simplify:  $10a - 3a = ?$

### Answers to Practice Questions:

1. Combine like terms:  $5y + 2y = 7y$

2. Simplify: Combine like terms ( $3x + 2x = 5x$ ), so  $5x + 4$

3. Evaluate: Substitute 2 for  $x$  ( $4(2) + 3 = 8 + 3 = 11$ )

4. Evaluate: Substitute 5 for  $y$  ( $2(5) + 6 = 10 + 6 = 16$ )

5. Simplify: Combine like terms ( $10a - 3a = 7a$ )