

# Parent Newsletter

## Chapter 3: Algebraic Expressions and Properties

### Standards

#### Common Core:

**6.NS.4:** Find the greatest common factor of two whole numbers less than or equal to 100 and the least common multiple of two whole numbers less than or equal to 12. Use the distributive property to express a sum of two whole numbers 1-100 with a common factor as a multiple of a sum of two whole numbers with no common factor.

**6.EE.2a:** Write expressions that record operations with numbers and with letters standing for numbers.

**6.EE.2c:** Evaluate expressions at specific values of their variables. Include expressions that arise from formulas used in real-world problems. Perform arithmetic operations, including those involving whole-number exponents, in the conventional order when there are no parentheses to specify a particular order (Order of Operations).

**6.EE.3:** Apply the properties of operations to generate equivalent expressions.

**6.EE.4:** Identify when two expressions are equivalent (i.e., when the two expressions name the same number regardless of which value is substituted into them).

### Essential Questions

How can you write and evaluate an expression that represents a real-life problem?

How can you write an expression that represents an unknown quantity?

Does the order in which you perform an operation matter?

How do you use mental math to multiply two numbers?

### Students will...

Use order of operations to evaluate algebraic expressions.

Use variables to represent numbers in algebraic expressions.

Write algebraic expressions.

Use properties of operations to generate equivalent expressions.

Use the Distributive Property to find products.

Use the Distributive Property to simplify algebraic expressions.

Use the Distributive Property to produce equivalent expressions.

Solve real-life problems.



### Key Term

An **algebraic expression** is an expression that may contain numbers, operations, and one or more symbols.

Parts of an algebraic expression are called **terms**.

A symbol that represents one or more numbers is called a **variable**.

The numerical factor of a term that contains a variable is a **coefficient**.

A term without a variable is called a **constant**.

Expressions with the same value are **equivalent expressions**.

In an algebraic expression, **like terms** are terms that have the same variables raised to the same exponents.

Writing a numerical expression or algebraic expression as a product of factors is called **factoring the expression**.

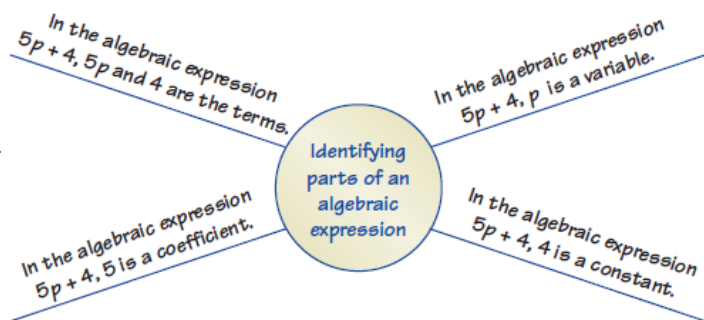
### Game

- A Trick for You

This is available online in the *Game Closet* at [www.bigideasmath.com](http://www.bigideasmath.com).

## Reference Tools

An **Information Wheel** can be used to organize information about a concept. Write the concept in the middle of the “wheel.” Then write information related to the concept on the “spokes” of the wheel. Related information can include, but is not limited to: vocabulary words or terms, definitions, formulas, procedures, examples, and visuals. This type of organizer serves as a good summary tool because any information related to a concept can be included.



## Quick Review

- A variable by itself has a coefficient of 1.
- To evaluate an algebraic expression, substitute a number for each variable. Then use the order of operations to find the value of the numerical expression.
- When you factor an expression, you can *factor out* any common factor.
- When simplifying a fraction, look for common factors between the numerator and denominator.
- To determine the math operations for expressions, look for these key words or phrases:

Operation	Addition	Subtraction	Multiplication	Division
<b>Key Words and Phrases</b>	added to plus sum of more than increased by total of and	subtracted from minus difference of less than decreased by fewer than take away	multiplied by times product of twice of	divided by quotient of

## Key Ideas

### Commutative Properties

- Changing the order of addends or factors does not change the sum or product.
- $a + b = b + a$   
 $a \cdot b = b \cdot a$

### Associative Properties

- Changing the grouping of addends or factors does not change the sum or product.
- $(a + b) + c = a + (b + c)$   
 $(a \cdot b) \cdot c = a \cdot (b \cdot c)$

### Multiplication Properties of Zero and One

- The product of any number and 0 is 0.
- The product of any number and 1 is that number.
- $a \cdot 0 = 0$   
 $a \cdot 1 = a$

### Addition Property of Zero

- The sum of any number and 0 is that number.
- $a + 0 = a$

### Distributive Property

- To multiply a sum or difference by a number, multiply each number in the sum or difference by the number outside the parentheses. Then evaluate.
- $a(b + c) = ab + ac$   
 $a(b - c) = ab - ac$

### Factoring an Expression

- You can use the Distributive Property to factor expressions.
- $ab + ac = a(b + c)$   
 $ab - ac = a(b - c)$

## What's the Point?

The ability to use algebraic expressions and properties is very useful in real life for events like buying uniforms for a sports team. Have your student research how much it would cost to buy hats, socks, pants, and shirts for their school's softball team. What is the total cost for uniforms for all of the players on the team? Is there more than one way to set up the expression(s)?

The STEM Videos available online show ways to use mathematics in real-life situations. The Chapter 3: Shadow Drawings STEM Video is available online at [www.bigideasmath.com](http://www.bigideasmath.com).

