

## What We Are Learning

## Expressions and Integers

## Vocabulary

These are the math words we are learning:

**absolute value** the distance a number is from zero on a number line

**algebraic expression** an expression with one or more variables

**evaluate** to find the value of a numerical or algebraic expression

**expression** a mathematical phrase that contains operations, numbers, and/or variables

**integers** the set of whole numbers and their opposites

**numerical expression** an expression that does not contain variables

**opposites** two numbers that are an equal distance from zero on a number line; also known as

**Additive Inverses**

**variable** a letter that represents a value that can change or vary

*Dear Family,*

The student will be learning about equations. Initially, the student will be evaluating algebraic expressions that contain up to two variables. When given the values of the variables, the student will simply “substitute” those values for the intended variable and then simplify the expression. This skill will help the student check his or her answers when solving equations.

Another skill the student will be reviewing is writing algebraic expressions in place of word phrases. Examples of the four basic operations and some key phrases that may help the student write these algebraic expressions are listed below.

Operation	Key Word Phrases	Expression
Addition	a number plus 6 add 6 to a number the sum of 6 and a number 6 more than a number	$6 + m$
Subtraction	a number minus 3 3 less than a number a number decreased by 3 the difference of a number and 3	$m - 3$
Multiplication	8 times a number the product of a number and 8	$8m$
Division	a number divided by 2 2 divided into a number the quotient of a number and 2	$m \div 2$ or $\frac{m}{2}$

The student needs to be very familiar with the four basic operations and how each operation works.

The student will be learning about a special set of numbers called integers. The set of integers includes the set of whole numbers and their opposites. Number lines will be used to introduce the concept of “opposite” numbers. The opposite of a number is the same distance from 0 as the given number on a number line. In mathematics, this distance is called absolute value, designated by the symbol  $| |$ .

Absolute value is always positive; it denotes distance from zero, and distance cannot be negative.

$$|7| = 7 \quad |-7| = 7$$

The student will learn how to add, subtract, multiply, and divide integers by following a few important, yet simple, guidelines.

### Guidelines for Adding Integers

If the signs are the **same**, find the **sum** of the absolute values of the integers and give that sum the same sign of the integers in the problem.

**Add.**       $-3 + -6$

*Think:* Find the sum of 3 and 6. The signs are the same so give the sum the sign of the integers.

$$-3 + -6 = -9$$

If the signs are **different**, find the **difference** of the absolute values. Use the sign of the integer with the greater absolute value.

**Add.**       $-2 + 5$

*Think:* Find the difference between 5 and 2. Because  $5 > 2$ , use the sign of 5.

$$-2 + 5 = 3$$

The strategies used for adding integers can also be applied to subtracting integers. To subtract integers, the student will change the subtraction sign to an addition sign and then *add the opposite* of what is shown.

The process of multiplying and dividing integers is very similar to multiplying and dividing whole numbers, except that the product/quotient has a sign. The student will learn these simple guidelines to determine the sign of his or her answer:

- If the integers have the same sign, the product or the quotient will **ALWAYS** be positive.

$$\begin{array}{ll} -4(-6) & \text{The signs are the same, so the answer is} \\ 24 & \text{positive.} \end{array}$$

- If the integers have different signs, the product or quotient will **ALWAYS** be negative.

$$\begin{array}{ll} -4(6) & \text{The signs are different, so the answer is} \\ -24 & \text{negative.} \end{array}$$

Practice mental math games with the student to help sharpen the student's skills with integers.

**Sincerely,**

## What We Are Learning

## Solving Equations

## Vocabulary

These are the math words we are learning:

**equation** a mathematical sentence that contains an equal sign

**inverse operations** operations that “undo” each other

*Dear Family,*

In this section, the student will learn to solve equations. To effectively solve equations, your child will learn the four equality properties: addition, subtraction, multiplication, and division. These properties are also known as inverse operations. The student will use these properties to isolate the variable in order to solve an equation.

An important element to solving equations is remembering to check the solution. As you help the student with his or her homework, make sure he or she does not forget this very important step.

This is how the student will use the properties of equality to solve one-step equations.

**Solve  $x + 3 = 15$ .**

$$\begin{array}{r} x + 3 = 15 \\ - 3 \quad - 3 \\ \hline x = 12 \end{array}$$

Subtract 3 from both sides using the Subtraction Property of Equality to isolate the variable,  $x$ .

**Check:**

$$\begin{array}{r} x + 3 = 15 \\ 12 + 3 \stackrel{?}{=} 15 \\ 15 = 15 \checkmark \end{array}$$

Substitute 12 for  $x$ .

**Solve  $8x = 24$ .**

$$8x = 24.$$

$$\frac{8x}{8} = \frac{24}{8}$$

$$x = 3$$

Divide both sides by 8 using the Division Property of Equality to isolate the variable,  $x$ .

**Check:**

$$\begin{array}{r} 8x = 24 \\ 8(3) \stackrel{?}{=} 24 \\ 24 = 24 \checkmark \end{array}$$

Substitute 3 for  $x$ .

After learning to solve one-step equations, the student will move on to two-step equations. As with one-step equations, the goal when solving a two-step equation is to isolate the variable. To do this, first use inverse operations to isolate the expression containing the variable, and then use inverse operations to isolate the variable itself.

**Solve  $4x + 7 = 39$ .**

$$4x + 7 = 39$$

$$\begin{array}{r} -7 \\ \hline 4x \end{array} = \begin{array}{r} 39 \\ -7 \\ \hline 32 \end{array}$$

$$\frac{4x}{4} = \frac{32}{4}$$

$$x = 8$$

Subtract 7 from both sides using the Subtraction Property of Equality to isolate the variable expression.

Divide both sides by 4 using the Division Property of Equality to isolate the variable,  $x$ .

**Check:**

$$4x + 7 = 39$$

$$4(8) + 7 \stackrel{?}{=} 39$$

$$32 + 7 \stackrel{?}{=} 39$$

$$39 = 39 \checkmark$$

Substitute 8 for  $x$ .

Make sure the student practices solving equations so that they have the confidence and skills to succeed in the chapters to follow.

**Sincerely,**