

What We Are Learning

Understanding Variables and Expressions

Vocabulary

These are the math words we are learning:

algebraic expression

an expression that contains one or more variables and may contain operation symbols

constant a quantity that does not change

variable a letter or symbol that represents a quantity that can change

Dear Family,

Your child is learning how to identify and evaluate algebraic expressions. When evaluating algebraic expressions, your child will substitute a value for the variable and then simplify the expression. An example of how to do this is below.

Evaluate each expression to find the missing values in the table.

w	$w \cdot 15$
10	150
12	■
15	■

Substitute the values for w in $w \cdot 15$.

$$w = 10; \quad 10 \cdot 15 = 150$$

$$w = 12; \quad 12 \cdot 15 = 180$$

$$w = 15; \quad 15 \cdot 15 = 225$$

The missing values are 180 and 225.

Your child will also learn how to use a table to find an algebraic expression. This is how your child will find an expression.

Find an expression for the table.

x	■
48	6
40	5
32	4

What pattern do you see?

$$48 \div 8 = 6$$

$$40 \div 8 = 5$$

$$32 \div 8 = 4$$

Each value for x is being divided by 8, so the expression for this table is $x \div 8$.

Whether your child is finding the value for a variable or finding the algebraic expression for a table, he or she is on the way to building a solid base for comprehending algebraic concepts.

A continuing step in solving algebraic problems is to know what action or operation to perform. Your child will learn the words that suggest the correct mathematical operation. You can help reinforce this concept by giving your child various scenarios and having her or him translate the words into math expressions and math expressions into words.

The following is a chart students will use to help decipher the math terminology.

Action/Words	Operation	Examples
Put together, sum, plus, added to, more than	Addition	$32 \text{ plus } 5 \rightarrow 32 + 5$ $x + 15 \rightarrow 15 \text{ added to } x$
Subtracted from, minus, take away, the difference of, less than	Subtraction	$s - 12 \rightarrow 12 \text{ less than } s$ $12 - 5 \rightarrow 12 \text{ minus } 5$ $5 - m \rightarrow m \text{ subtracted from } 5$
Times, multiplied, product, doubling, tripling	Multiplication	$12a \rightarrow 12 \text{ times } a$ $3 \cdot 6 \rightarrow \text{the product of } 3 \text{ and } 6$
Divided by, quotient	Division	$125 \div 25 \rightarrow \text{the quotient of } 125 \text{ and } 5$ $n \div 3 \rightarrow n \text{ divided by } 3$

This is how your child will translate words into math expressions and math expressions into words.

Write each phrase as a numerical or algebraic expression.

- A. the product of x and 14 $14x$
- B. the difference of 127 and 115 $127 - 115$

Write two phrases for the expression $45x$.

the product of 45 and x 45 times x

Reviewing these math terms with your child will help reinforce his or her math vocabulary and build your child's confidence in understanding variables and expressions.

Sincerely,

CHAPTER 2 **Family Letter**
2 Understanding Variables and Expressions

Evaluate each expression to find the missing values in the tables.

1.

a	$a + 12$
52	64
67	
89	

2.

x	$5x$
11	55
12	
13	

Find an expression for each table.

3.

w	■
18	12
28	22
38	32

4.

r	■
12	6
14	7
16	8

5. Is $3x + 15$ an algebraic expression? _____
6. Evaluate $x + 20$ for $x = 7$. _____
7. Evaluate $12s$ for $s = 3$. _____

Write an expression.

8. A watch cost d dollars. How would you write the cost of a radio that costs \$15 more than the watch?

9. If you divide n newspapers into 5 equal piles, how many newspapers are in each pile?

Write each phrase as a numerical or algebraic expression.

10. 35 less than p _____
11. the sum of 52 and 108 _____
12. Write two phrases for the expression $d + 23$.

Answers: 1. 79; 101 2. 60; 65 3. $w - 6$ 4. $r \div 2$ 5. Yes 6. 27 7. 36 8. $d + 15$ 9. $n \div 5$ 10. $p - 35$
 11. 52 + 108 12. d plus 23; 23 more than d ; 23 added to d ; the sum of d and 23

Family Fun

Mind-Reading Mathematics

If you have ever wanted to impress your friends and family by being able to read their minds, now is your chance!

Just follow these simple directions for two amazing tricks to become a Mind-Reading Mathematician.

Game 1

I Can Guess Your Answer

1. Think of a number.
2. Double it.
3. Add 6.
4. Divide it by 2.
5. Subtract your original number from the quotient.

What is your answer every single time?

Game 2

I Know What You're Thinking

1. Think of a number between 1 and 9.
2. Multiply that number by 7.
3. Multiply that product by 3.
4. Multiply that product by 11.
5. Multiply that product by 37.
6. Multiply that product by 13.

What is your answer every single time?

Answers: Game 1. 3 Game 2. Six digit number with the same digit repeated. Sample: 111,111

What We Are Learning

Equations

Vocabulary

These are the math words we are learning:

equation a mathematical statement that says two quantities are equal

solution a value that makes the equation true

Dear Family,

In the previous lesson, your child learned to translate words into numbers, variables, and operations. Your child will build on this by learning to solve equations. The first step in solving equations is understanding that the solution for the equation makes the equation true. Your child will learn how to determine if a specific value is a solution of an equation.

This is how your child will determine if a given value is a solution to an equation.

Determine whether the given value of the variable is a solution.**A. $b - 9 = 22$ for $b = 27$**

$$27 - 9 \stackrel{?}{=} 22 \quad \text{Substitute 27 for } b.$$

$$18 \stackrel{?}{=} 22 \quad \text{Subtract.}$$

$$18 \neq 22$$

Since 18 does not equal 22, 27 is not a solution to $b - 9 = 22$.

B. $17v = 102$ for $v = 6$

$$17 \cdot 6 \stackrel{?}{=} 102 \quad \text{Substitute 6 for } v.$$

$$102 \stackrel{?}{=} 102 \quad \text{Multiply.}$$

Since $102 = 102$, then 6 is a solution to $17v = 102$.

Your child will use this skill to check the solutions to the equations he or she will be solving.

Once your child knows how to check if a solution to an equation is true, he or she will learn how to solve four different types of whole number equations. These equations involve addition, subtraction, multiplication, and division. For each equation type, your child will learn how to “undo” the given operation by performing the inverse or opposite operation.

One of the most important and often overlooked steps in equation solving is checking to make sure the solution is correct. Reinforce with your child the importance of checking his or her solution.

Solve each equation. Check your answers.

Addition

$$x + 77 = 115$$

$$\frac{-77}{x} = \frac{-77}{38}$$

77 is added to x .

Subtract 77 from both sides to undo the addition.

$$\text{Check: } x + 77 \stackrel{?}{=} 115$$

$$38 + 77 \stackrel{?}{=} 115$$

$$115 = 115 \checkmark$$

Substitute 38 for x in the equation.
38 is the solution.

Subtraction

$$k - 14 = 35$$

$$\frac{+14}{k} = \frac{+14}{49}$$

14 is subtracted from k .

Add 14 to both sides to undo the subtraction.

$$\text{Check: } k - 14 \stackrel{?}{=} 35$$

$$49 - 14 \stackrel{?}{=} 35$$

$$35 = 35 \checkmark$$

Substitute 49 for k in the equation.
49 is the solution.

Multiplication

$$15t = 75$$

$$\frac{15t}{15} = \frac{75}{15}$$

$$t = 5$$

t is multiplied by 15.

Divide both sides by 15 to undo the multiplication.

$$\text{Check: } 15t \stackrel{?}{=} 75$$

$$15(5) \stackrel{?}{=} 75$$

$$75 = 75 \checkmark$$

Substitute 5 for t in the equation.
5 is the solution.

Division

$$\frac{a}{12} = 8$$

a is divided by 12.

$$12 \cdot \frac{a}{12} = 8 \cdot 12$$

$$a = 96$$

Multiply both sides by 12 to undo the division.

$$\text{Check: } \frac{a}{12} \stackrel{?}{=} 8$$

$$\frac{96}{12} \stackrel{?}{=} 8$$

$$8 = 8 \checkmark$$

Substitute 96 for a in the equation.
96 is the solution.

Solving for x can be challenging and exciting. Encourage your child to practice making up different whole number equations and challenge each other to see who solves them more quickly.

Sincerely,

Family Letter**Equations**

Determine whether the given value of the variable is a solution.

1. $3 + h = 71$ for $h = 68$

2. $g - 6 = 15$ for $g = 10$

3. $\frac{r}{10} = 9$ for $r = 90$

4. $16t = 84$ for $t = 4$

Solve each equation. Check your answers.

5. $x + 36 = 48$

6. $\frac{p}{8} = 12$

7. $u - 17 = 32$

8. $36n = 36$

9. $44 = w + 38$

10. $\frac{q}{16} = 5$

Write and solve an equation.

11. Carole spent \$45 on shoes. After her purchase, she had \$58 left. How much money did she start with?

12. Brian has 315 stamps in his collection. One stamp book holds 35 stamps. How many books does Brian need to hold his whole collection?

Answers: 1. yes 2. no 3. yes 4. no 5. $x = 12$ 6. $p = 96$ 7. $u = 49$ 8. $n = 1$ 9. $w = 6$ 10. $q = 80$
11. $x - 45 = 58$; She started with \$103. 12. 315 = 35 n ; He needs 9 books.

Family Fun

SEA-MAIL

Solve each equation. Then put the letter of the variable above its value to answer the riddle.

$14d = 84 \qquad d = \underline{\hspace{2cm}}$

$32 = y + 21 \qquad y = \underline{\hspace{2cm}}$

$\frac{o}{4} = 6 \qquad o = \underline{\hspace{2cm}}$

$r - 3 = 15 \qquad r = \underline{\hspace{2cm}}$

$25c = 125 \qquad c = \underline{\hspace{2cm}}$

$s + 17 = 26 \qquad s = \underline{\hspace{2cm}}$

$\frac{n}{0.5} = 8 \qquad n = \underline{\hspace{2cm}}$

$b - 7 = 5 \qquad b = \underline{\hspace{2cm}}$

$180 = 12e \qquad e = \underline{\hspace{2cm}}$

How did the Vikings send secret messages?

12 11 4 24 18 9 15 5 24 6 15