

**Today's lesson is focusing on Evaluating
an Writing Algebraic Expressions.**

Gather your clicker, notebook, and pencil.

Get ready for the warm-up questions.



Solve: $3 + 4(2)$

Text in your answer.



Solve: $(4 + 3)(2) - 11$


Text in your response.

2-1

Evaluating and Writing Algebraic Expressions

What You'll Learn

To write and evaluate algebraic expressions

 **New Vocabulary** variable, algebraic expression

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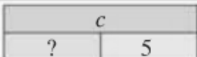
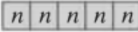
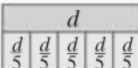
Why Learn This?

You can use algebraic expressions to help you make predictions based on patterns. If you know how far you can swim in 1 minute, you can estimate how far you can swim in 5 minutes.

A **variable** is a symbol that represents one or more numbers. Variables are usually letters. An **algebraic expression** is a mathematical phrase with at least one variable.



Diagrams and algebraic expressions can represent word phrases.

Word Phrase	Diagram	Algebraic Expression
a temperature of t degrees increased by 5 degrees		$t + 5$
five cats fewer than c cats		$c - 5$
the product of 5 and n nickels		$5n$
a dinner bill of d dollars divided among five friends		$\frac{d}{5}$

EXAMPLE**Writing Algebraic Expressions**

- 1** Write an algebraic expression for each word phrase.
- swimming m meters per minute for 3 minutes $\rightarrow 3m$
 - 12 heartbeats more than x heartbeats $\rightarrow x + 12$

Examples

1 **Writing Algebraic Expressions** Write an algebraic expression for each word phrase.

- a. 6 less than d dollars
- b. the sum of s students and 9 students
- c. 12 times b boxes
- d. 20 hours of work divided equally among w workers



Write an algebraic expression for a price p decreased by 16.

(A) $p - 16$

(B) $16 - p$

(C) $16 + p$

(D) $p + 16$

You can use algebraic expressions to represent real-world situations.

EXAMPLE Application: Public Service



2 The Environmental Club is making posters. The materials for each poster cost \$4. Write an algebraic expression for the cost of p posters.

Words \$4 per poster times the number of posters

Expression 4 · p

An algebraic expression for the cost of the posters is $4p$.

- 2 **Art Supplies** The cost of a package of markers is d dollars. Write an algebraic expression for the total cost in dollars of 7 packages of markers.

Words

number of packages times cost per package



Let d = cost per package.

Expression

7 · d

An algebraic expression for the total cost in dollars is $7d$.



Each of the nine students in the club is going to hang t posters. Write an algebraic expression for the total number of posters the students will hang.

(A) $9t$

(B) t^9

(C) 9^t

(D) $9 + t$

You can substitute for a variable to evaluate an algebraic expression.

EXAMPLE Evaluating Algebraic Expressions

- 4 Evaluate each expression. Use the values $p = 2$, $n = 3$, and $s = 5$.

a. $2p + 7$

$$\begin{aligned} 2p + 7 &= 2(2) + 7 && \leftarrow \text{Substitute.} \rightarrow \\ &= 4 + 7 && \leftarrow \text{Multiply.} \rightarrow \\ &= 11 && \leftarrow \text{Add.} \rightarrow \end{aligned}$$

b. $p + (n \cdot s)$

$$\begin{aligned} p + (n \cdot s) &= 2 + (3 \cdot 5) \\ &= 2 + (15) \\ &= 17 \end{aligned}$$

- 4 Evaluating Algebraic Expressions** Evaluate each expression.
Use the values $r = 8$, $s = 1$, and $t = 3$.

a. $6(t - 1)$

$$6(t - 1) = 6(\square - 1) \quad \leftarrow \text{Substitute}$$
$$= 6(\square) \quad \leftarrow \text{Subtract.}$$
$$= \square \quad \leftarrow \text{Multiply.}$$

b. $\frac{r}{s + t}$

$$\frac{r}{s + t} = \frac{\square}{\square + \square} \quad \leftarrow \text{Substitute.}$$
$$= \frac{\square}{\square} \quad \leftarrow \text{Simplify the denominator.}$$
$$= \square \quad \leftarrow \text{Divide.}$$



Use the values $n = 3$, $t = 5$, and $y = 7$ to evaluate:

$$y(n + t)$$

(A) 15

(B) 105

(C) 38

(D) 56



What is the difference between an algebraic expression and a numerical expression?

(A) An algebraic expression only contains certain numbers.

(B) An algebraic expression contains at least one variable, and the value changes.

(C) An algebraic expression contains an equals sign.

(D) A numerical expression contains an equals sign.



Tell which operation you would use for the phrase: six goals fewer than g goals

A subtraction

B multiplication

C addition

D division



Write a word phrase for:
 $w - 3$

A w less than three

B three more than w

C three decreased by w

D three less than w



Write a word phrase for:
 $5w$

A the product of five and w

B the difference of five and w

C the quotient of five and w

D the sum of five and w

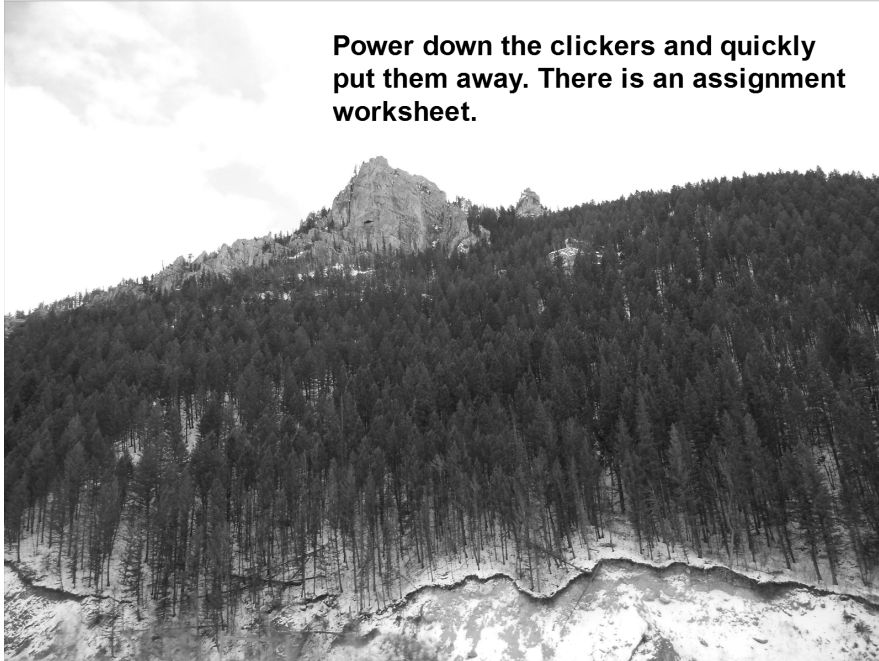


Write a word phrase for:

w
4

- (A) the quotient of w and four
- (B) w decreased by four
- (C) the difference of four and w
- (D) the product of w and four

Power down the clickers and quickly put them away. There is an assignment worksheet.



Name _____ Class _____ Date _____

Reteaching 2-1

To evaluate an expression, substitute a value for the variable and compute.

Evaluate $5y - 8$ for $y = 7$.
 $5y - 8$
 $5 \times 7 - 8$ ← Substitute y with 7.
 $35 - 8 = 27$ ← Compute.

Evaluating and Writing Algebraic Expressions

You can use key words to write a word phrase for an algebraic expression.

$a + 5$ → a plus 5
 or a increased by 5
 $2n$ → the product of 2 and n
 or 2 times n

Evaluate each expression using the values $m = 3$ and $x = 8$.

1. $4m + 9$
 Substitute m : $4 \times \underline{\quad} + 9$
 Compute: $\underline{\quad} + 9 = \underline{\quad}$

2. $4x - 7$
 Substitute x : $4 \times \underline{\quad} - 7$
 Compute: $\underline{\quad} - 7 = \underline{\quad}$

3. $5x + x$
 Substitute x : $5 \times \underline{\quad} + \underline{\quad}$
 Compute: $\underline{\quad} + \underline{\quad} = \underline{\quad}$

4. $x + 2m$
 Substitute x and m : $\underline{\quad} + 2 \times \underline{\quad}$
 Compute: $\underline{\quad} + \underline{\quad} = \underline{\quad}$

Evaluate each expression using the values $y = 4$, $z = 8$, and $p = 10$.

5. $3y + 6 = \underline{\quad}$

6. $4z - 2 = \underline{\quad}$

7. $p + 2p = \underline{\quad}$

8. $3z \times z = \underline{\quad}$

Write a word phrase for each algebraic expression.

9. $9 + x$

10. $6x$

11. $x - 8$

12. $\frac{3}{4}$

Write an algebraic expression for each word phrase.

13. x newspapers plus 10

14. 4 less than x teabags

15. 3 more than x envelopes

16. 6 times x school buses