Name _____

Reteaching
8-1

Using Variables to Write Expressions

A variable represents a quantity that can change. To use a variable to write an algebraic expression for a situation, you need to decide which operation is appropriate for the situation. To help you, some words and phrases are listed below.

Word phrase	Variable	Operation	Algebraic Expression
ten **more than** a number b	b	Addition	$b + 10$
the **sum** of 8 and a number c	c		$8 + c$
five **less than** a number d	d	Subtraction	$d - 5$
15 **decreased by** a number e	e		$15 - e$
the **product** of 8 and a number f	f	Multiplication	$8f$
19 **times** a number g	g		$19g$
a number h **divided by** 2	h	Division	$h \div 2$
a number i **divided into** 50	i		$50 \div i$

Write each algebraic expression.

1. a number k **divided by** 6

Identify the operation. _____ Write the expression. _____

2. the **sum** of 8 and a number q _____

3. 5 **times** a number b _____

4. a number j **divided into** 3 _____

5. 7 **less than** a number d _____

6. n fewer carrots than 12 _____

7. w lunches at $9 each _____

8. A touchdown scores 6 points. Write an algebraic expression to represent the number of points the Hawks will score from touchdowns.

Identify the operation _____ Write the expression. _____

9. Write an algebraic expression to represent the situation below. Explain how the expression relates to the situation.

Some children share 6 oranges equally among themselves.

_____

_____

Name _____

Practice
8-1

Using Variables to Write Expressions

Write each algebraic expression.

1. 5 more than a number s _____

2. twice a number k _____

3. 17 less than a number g _____

4. the product of 8 and a number p _____

5. 84 divided by a number z _____

6. the sum of a number t and 31 _____

7. 7 more tickets than a number m _____

8. 21 fewer stars than three times a number h _____

9. Cassie has $12. She buys a balloon. Which expression shows how much money Cassie has left?

A $b + 12$

B $12 - b$

C $12b$

D $b \div 12$

10. A theater has main floor and box seating. The main floor can seat 14 people in each row. Another 20 people can sit in the box seats. Which expression shows how many people can be seated in the theater?

A $20f - 14$

B $20f + 14$

C $14f - 20$

D $14f + 20$

11. Heather bought enough shells to make x necklaces. Each necklace holds 16 shells. Heather has made 10 necklaces. Is $16x + 10$ a reasonable way to represent the number of shells that Heather has left to make necklaces with? Explain your answer.

_____

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_____

Name _____

Reteaching
8-2

Order of Operations

If you do not use the proper order of operations, you will not get the correct answer.

Evaluate $2^3 \div 2 + 3 \times 6 - (1 \times 5)$.

Step 1. Do the operations inside the parentheses.

$(1 \times 5) = 5$
$2^3 \div 2 + 3 \times 6 - 5$

Step 2. Evaluate any terms with exponents.

$2^3 = 8$
$8 \div 2 + 3 \times 6 - 5$

Step 3. Multiply and divide in order from left to right.

$8 \div 2 = 4$ and $3 \times 6 = 18$
$4 + 18 - 5$

Step 4. Add and subtract in order from left to right.

$4 + 18 = 22$
$22 - 5 = 17$
So, $2^3 \div 2 + 3 \times 6 - (1 \times 5) = 17$

Write which operation should be done first.

1. $6 + 3 \times 2$ _____

2. $13 - 1 + 4 \div 2$ _____

3. $5 \times (7 - 2) + 1$ _____

4. $(19 + 23) - (4 \times 5)$ _____

For questions **5** through **8**, evaluate the expression for $x = 6$ and $y = 17$.

5. $4x + 5y$ _____

6. $2x + (20 - y)$ _____

7. $x \div 3 + y$ _____

8. $4y \div 2 + (8x + 10)$ _____

9. Patty made $34 baby sitting on each of 3 weekends. If she spent $50 on gifts for her family, how much money does she have left?

_____

10. Carlos solved $20 - (2 \times 6) + 8 \div 4 = 29$. Is this the correct answer?

_____

_____

Name _____

Practice
8-2

Order of Operations

Use the order of operations to evaluate each expression.

1. $4 \times 4 + 3 =$ _____

2. $3 + 6 \times 2 \div 3 =$ _____

3. $24 - (8 \div 2) + 6 =$ _____

4. $(15 - 11) \times (25 \div 5) =$ _____

5. $26 - 4 \times 5 + 2 =$ _____

6. $15 \times (7 - 7) + (5 \times 2) =$ _____

7. $(8 \div 4) \times (7 \times 0) =$ _____

8. $5 \times (6 - 3) + 10 \div (8 - 3) =$ _____

9. Which is a true statement, $5 \times 4 + 1 = 25$ or $3 + 7 \times 2 = 17$? Explain your answer.

_____

_____

Insert parentheses to make each statement true.

10. $25 \div 5 - 4 = 25$ _____

11. $7 \times 4 - 4 \div 2 = 26$ _____

12. $3 + 5 \times 2 - 10 = 6$ _____

13. Insert parentheses in the expression $6 + 10 \times 2$ so that:

a. the expression equals 32. _____

b. the expression equals $(12 + 1) \times 2$. _____

14. Solve $(25 - 7) \times 2 \div 4 + 2$.

A 18 B 11 C 6 D 5

15. Write two order-of-operation problems. Then trade with a classmate and solve the problems.

_____

_____

Name _____

Reteaching
8-3

Simplifying Expressions

When an expression contains more than one operation, **parentheses ( )** can be used to show which computation should be done. Parentheses are one type of **grouping symbol**.

Do the computation inside the parentheses first.

Evaluate $(2 + 8) \times 3$.

$10 \times 3 = 30$

Evaluate $2 + (8 \times 3)$.

$2 + 24 = 26$

Some expressions contain more than one set of parentheses.

Do the computation inside each pair of parentheses first.

Evaluate $(4 + 9) - (30 \div 5)$.

$13 - 6 = 7$

After you solve the computations inside the parentheses, use the order of operations to choose which computation to solve next:

Exponents

Multiplication and division from left to right

Addition and subtraction from left to right

---

1. $(16 + 4) \div 10$ _____

2. $(16 \div 4) + (10 - 3)$ _____

3. $8^2 \div (2 \times 4)$ _____

4. $27 - (5 \times 3)$ _____

5. $(4 \times 6) \div 6 + 6$ _____

6. $(36 \div 6) \times 2^2$ _____

7. Evaluate $11 \times (8 - n)$ for $n = 4$. _____

Name _____

Practice
8-3

Simplifying Expressions

1. $(18 \div 9) + 7$ _____

2. $(4 + 3) \times (9 - 2)$ _____

3. $32 \div (8 + 8)$ _____

4. $(26 - 17) \times (9 \div 3)$ _____

5. $64 \div (5 + 1 + 2)$ _____

6. $27 \div (3 \times 3) + 7$ _____

Rewrite with parentheses to make each sentence true.

7. $42 + 12 \div 6 = 44$ _____

8. $33 - 14 + 4 = 15$ _____

9. $32 \div 8 \times 2 = 8$ _____

Evaluate each expression for $w = 9$.

10. $72 \div (w + 0)$ _____

11. $(12 + w) \div 3$ _____

12. $(0 + w) \times 2$ _____

13. Write an expression to show how much Gretchen paid for drama, action, and comedy videos if she paid $4 each at a sale.

_____

Gretchen's Video Purchases	
Mystery	6
Action	3
Comedy	5
Drama	2
Romance	2

14. Which statement is true when $x = 7$?

A $63 \div x = 21$

B $(x - 6) - (1 \times 1) = 1$

C $0 \div x = 7$

D $(2 + 7) \times (12 - x) = 45$

15. Evaluate the expression $7 + (32 \div 16) \times 4 - 6$. What steps did you use to find the answer?

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Name _____

Reteaching
8-4

Evaluating Expressions

Brackets and parentheses are both used to show groupings.
Brackets are used to avoid double parentheses: [(instead of ((.

Evaluate expressions according to the order of operations.

1. Evaluate inside parentheses, then evaluate inside brackets.	$2.3^2 + [\mathbf{(9 \times 0.4)} + \mathbf{(3 \times 0.8)}] \times 1.2$ $2.3^2 + \mathbf{[3.6 + 2.4]} \times 1.2$ $2.3^2 + 6 \times 1.2$
2. Evaluate terms with exponents.	$\mathbf{2.3^2} + 6 \times 1.2$ $5.29 + 6 \times 1.2$
3. Multiply and divide from left to right.	$5.29 + \mathbf{6 \times 1.2}$ $5.29 + 7.2$
4. Add and subtract from left to right.	$\mathbf{5.29 + 7.2}$ 12.49

Evaluate each expression.

1. $(4.8 \div 2) \times 5$

_____

2. $3.6 + (3 \times 9.6 - 4.8)$

_____

3. $[(6.2 \times 8.4) - 9.28]$

_____

4. $[7 \times (9.6 \div 3)] + 12.4$

_____

5. $6 \times [(6 \times 2.3) + 3.9]$

_____

6. $2^4 \div [(3.35 \times 0.8) + 5.32]$

_____

7. $9.6 + [(3.1 \times 2) - 2.3] + 4^2$

_____

8. $6^2 - 9 \div [(0.24 \times 5) + (0.66 \times 5)]$

_____

9. How would you use estimation to evaluate this expression: $10.2 \times [(2 \times 3.7) + 8]$?

_____

Name _____

Practice
8-4

Evaluating Expressions

1. $5^2 - (3.1 \times 6 + 5.3)$

_____

2. $4^2 - [(4.2 \times 3.5) - 9.5]$

_____

3. $3^2 - [(12 - 2^2) \times 0.6]$

_____

4. $[(0.2 \times 8) + (2.5 \times 3)] + 5^2$

_____

5. $42 \div [8.6 - (8 \times 0.2)]$

_____

6. $3^3 + 4.2 \times 8 \div 0.2$

_____

7. $6.8 + [(0.5 \times 7) + (3.1 \times 3)]$

_____

8. $5^2 - [(6^2 - 32.4) + (8 \div 0.5)] + 4.5$

_____

9. $9 + [(4.2 - 3.3) + (6.4 \div 0.8)] \times 3$

_____

10. $41 - 3^2 + (8 \times 2.3) - 15 + (2.1 \times 4)$

_____

11. Keisha bought a new pair of skis for $450. She put $120 down and got a student discount of $45. Her mother gave her $\frac{1}{2}$ of the balance for her birthday. Which of these expressions could be used to find the amount Keisha still owes on the skis?

A $450 - 120 + 45 \div 2$

B $[450 - (120 - 45) \div 2]$

C $450 - (120 - 45) \div 2$

D $[450 - (120 + 45)] \div 2$

12. $(7 \times 3.4) - [(2.8 \times 5) - (4.3 \times 2)] + 4^2$. Give the order of operations a student solving this problem would use to evaluate the expression. Solve.

_____

_____

Name _____

Reteaching
8-5

Addition and Subtraction Expressions

How do you find a rule to write an expression?

To find a rule and write an expression, look at the numbers being compared. Which is the greater number?

Consider 57 and 50. 57 is greater than 50, so rule out addition.

Find how much greater 57 is than 50. 57 is 7 more than 50, so the rule must involve subtraction.

Look at the other two columns of numbers and compare them. The top number is 7 more than the bottom number.

A rule is subtract 7, so the expression is $v - 7$.

v	57	28	10
	50	21	3

Compare the numbers in each column of the table.

Find a rule for each table.

1.

r	24	28	31	36
	11	15	18	23

2.

f	17	41	86	93
	21	45	90	97

Find a rule and write the missing number for each table.

3.

c	7	10	15	19
	32	35		44

4.

h	52	47	40	36
	44	39		28

5.

m	68	72	77	82
	25		34	39

6.

s	34	37	74	78
	51	54	91	

Name _____

Practice
8-5

Addition and Subtraction Expressions

Find a rule and write the missing number for each table.

1.

r	19	24	32	37
	7	12	20	

2.

a	6	9	12	15
	40		46	49

3.

s	10	15	25	30
	5	10		25

4.

b	16	19	22	26
		35	38	42

5.

w	3	6	9	12
	6		12	15

6.

n	51	42	33	24
	40	31		13

7. Evaluate the expression $15 - n$ when $n = 9$. _____

8. Which expression stands for "32 more than a number d"?

A $32 \times d$

B $32 - d$

C $32 + d$

D $32 \div d$

9. Explain what the variable represents in an addition or subtraction expression.

_____

_____

_____

Name _____

Reteaching
8-6

Multiplication and Division Expressions

Find a rule and write an expression using multiplication and division.

To find a rule and write an expression, look at the numbers being compared. Which is the greater number?

Consider 3 and 24. Because 24 is greater than 3, you can rule out subtraction and division.

Find how much greater 24 is than 3. Since 24 is 8 times 3, the rule must involve multiplication.

Look at the other two columns of numbers and compare them. The bottom number is 8 times as great as the top number.

A rule is multiply by 8, so the expression is $8 \times b$.

b	3	6	8
	24	48	64

Compare the numbers in each column of the table.

Find a rule for each table.

1.

a	48	56	64	72
	6	7	8	9

2.

u	8	11	13	16
	32	44	52	64

Find a rule and write the missing number for each table.

3.

j	18	14	12	8
	9	7		4

4.

e	2	4	6	7
	6	12	18	

5.

p	4	6	10	17
	20		50	85

6.

q	48	42	30	24
	8		5	4

Name _____

Practice
8-9

Problem Solving: Act It Out and Use Reasoning

1. Christina collects stamps. She has 47 stamps in all. She has 20 stamps from Europe. The number of African stamps is 2 times the number of Asian stamps. How many stamps from each of these three continents does she have?

_____

2. Write a problem that can be solved by acting it out and using reasoning.

_____

_____

_____

3. A public pool opened for the summer. A total of 246 people came swimming over the first 3 days it was open. On the first day, 79 came to swim. On the second day, 104 people swam. How many people swam on the third day?

_____

4. Marissa earned $480 in the summer. If she earned $40 a week, how many weeks did she work?

A 48 **B** 12 **C** 10 **D** 9

5. How could you use cubes to act out a problem?

_____

_____

_____

_____

_____

