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Reteaching 2-1

Variables and Expressions

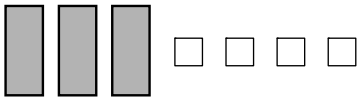
Numerical expressions are made up of numbers and operation symbols.

Example 1:
$6 + 3$ $9 \times 2 + 1$

Algebraic expressions contain one or more variables. A *variable* is a letter that stands for an unknown number.

Example 2:
$x + 4 \times 2$ $a - b$

You can model algebraic expressions using algebra tiles.



The 3 shaded rectangles represent 3 of the same variable. The 4 white squares represent 4 ones.

$3 \times p + 4 \times 1 = 3p + 4$

You can evaluate the algebraic expression $3p + 4$ if you know a value for p. Evaluate this expression for $p = 6$.

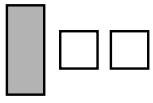
① Think of each rectangle as having a value of 6.

$3p + 4$ for $p =$ **6** means $3 \times$ **6** $+ 4$

② Then use the order of operations to evaluate.

$3p + 4 = 3 \times 6 + 4$
$= 18 + 4$
$= 22$

Write an algebraic expression for each model.

1. 

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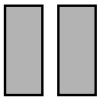
2. 

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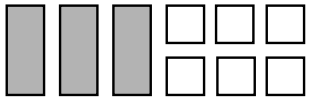
3. 

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Evaluate each expression.

4. $7c$ for $c = 6$

$7 \times$ ____ $=$ ____

5. $3t - 4$ for $t = 8$

$3 \times$ ____ $- 4 =$ ____

6. $15 + m$ for $m = 6$

_____

7. $2x + 1$ for $x = 3$

_____

8. $5y - 10$ for $y = 6$

_____

9. $3(4h)$ for $h = 2$

_____

10. $a - b$ for $a = 5$ and $b = 4$

_____

11. $x + 2y$ for $x = 3$ and $y = 2$

_____

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Reteaching 2-2

Writing Algebraic Expressions

These terms are used to describe mathematical operations.

Addition	Subtraction	Multiplication	Division
sum more than increased by total added to	difference less than fewer than decreased by	product times multiplied by	quotient of divided by

You can use the terms above to write word phrases for algebraic expressions, and algebraic expressions for word phrases.

Word Phrase		Algebraic Expression
the sum of m and 17	$\longleftrightarrow$	$m + 17$
the difference of x and 12	$\longleftrightarrow$	$x - 12$
3 times w	$\longleftrightarrow$	$3w$
the quotient of q and 6	$\longleftrightarrow$	$q \div 6$

Write a word phrase for each expression.

1. $n + 8$ _____

2. $3x$ _____

3. $w - 2$ _____

Write an expression for each word phrase.

4. 6 increased by y _____

5. the quotient of 8 and e _____

6. 3 less than h _____

7. 4 times w _____

8. the difference of s and 8 _____

9. r divided by 2 _____

10. 5 more than n _____

11. the product of 6 and m _____

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Reteaching 2-3

Using Number Sense to Solve One-Step Equations

One way to solve some equations is to use mental math.

Example 1: Find the solution to the equation.
$a + 5 = 10$

What you think:
If I add 5 to 5, the sum is 10.
$5 + 5 = 10$
So, $a = 5$.

Example 2: Find the solution to the equation.
$y - 9 = 15$

What you think:
If I subtract 9 from 24, the difference is 15,
$24 - 9 = 15$
So, $y = 24$.

Example 3: Find the solution to the equation.
$w \div 5 = 100$

What you think:
$w \div 5$ means w divided by 5.
I know that $500 \div 5 = 100$.
$500 \div 5 = 100$

So, $w = 500$.

Example 4: Find the solution to the equation.
$4w = 24$

What you think:
$4w$ means 4 times w.
I know that $4 \cdot 6 = 24$.

So, $w = 6$.

Use mental math to solve each equation.

1. $4q = 12$ _____

2. $3w = 15$ _____

3. $h + 7 = 16$ _____

4. $k + 2 = 8$ _____

5. $n \div 3 = 12$ _____

6. $m \div 2 = 10$ _____

7. $y - 8 = 12$ _____

8. $w - 5 = 8$ _____

Tell whether each equation is true or false.

9. $18 + 25 = 43$ _____

10. $1{,}100 - 200 = 900$ _____

11. $16 \times 4 = 32$ _____

12. $18 = 9 \div 2$ _____

13. $77 + 12 = 99$ _____

14. $2 \times 9 = 81$ _____

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Reteaching 2-4

Solving Addition Equations

In the equation $x + 5 = 33$, 5 is added to the variable. To solve the equation, undo the operation to get the x alone on one side of the equal sign. Undo addition by subtracting.

Solve $x + 5 = 33$

$x + 5 - 5 = 33 - 5$ ← Subtract 5 from each side to undo the addition and get x by itself.

$x = 28$ ← Simplify.

Check $x + 5 = 33$ ← Check your solution in the original equation.

$28 + 5 \stackrel{?}{=} 3$ ← Substitute 28 for x.

$33 = 33$ ✓

Drawing a diagram can help you write an equation to solve a problem.

Whole	
Part	Part

33	
x	5

Solve each equation. Then check each solution.

1. Solve: $x + 5 = 33$

$x + 5 - \_\_ = 33 - \_\_$

$x = \_\_$

Check: $x + 5 = 33$

$\_\_ + 5 \stackrel{?}{=} 33$

$\_\_ = 33$

2. $19 + t = 51$

_____

3. $60 = n + 30$

_____

4. $86 + m = 107$

_____

5. $w + 349 = 761$

_____

Draw a diagram to model the situation. Then write and solve an equation.

6. A car dealer purchased a car for $2,000 and then sold it for $3,200. What was the profit?

_____

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Reteaching 2-5

Solving Subtraction Equations

In some equations, a number is subtracted from the variable. To solve, *undo* the subtraction by adding the same amount to both sides of the equation.

Solve $r - 13 = 9$

$r - 13 + 13 = 9 + 13$ ← Add 13 to each side to undo the subtraction and get r by itself.

$r = 22$ ← Simplify.

Check $r - 13 = 9$ ← Check your solution in the original equation.

$22 - 13 \stackrel{?}{=} 9$ ← Substitute 22 for r.

$9 = 9$ ✓

Drawing a diagram can help you write an equation to solve a problem.

Whole	
Part	Part

r	
13	9

Solve each equation. Then check each solution.

1. Solve: $8 = x - 21$

$8 + \_\_ = x - 21 + \_\_$

$\_\_ = x$

Check: $8 = x - 21$

$8 \stackrel{?}{=} \_\_ - 21$

$8 = \_\_$

2. $p - 11 = 12$

_____

3. $71 = b - 29$

_____

4. $y - 53 = 30$

_____

5. $75 = d - 127$

_____

Draw a diagram to model the situation. Then write and solve an equation.

6. There were 18 friends at Luke's birthday party. Seven of the friends he invited were not able to attend. How many friends did he invite?

_____

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Reteaching 2-6

Solving Multiplication and Division Equations

To solve a multiplication or division equation, *undo* the operation to get the variable alone. Multiplication and division are *inverse operations*, which means that they undo each other.

To solve a multiplication equation, divide.

$4w = 56$

$4w \div 4 = 56 \div 4$ ← Divide each side by 4.

$w = 14$ ← Simplify.

Check $4 \cdot 14 \stackrel{?}{=} 56$ ← Check your solution. Replace w with 14.

$56 = 56$ ✓

56			
w	w	w	w

To solve a division equation, multiply.

$y \div 7 = 13$

$y \div 7 \cdot 7 = 13 \cdot 7$ ← Multiply each side by 7.

$y = 91$ ← Simplify.

Check $91 \div 7 \stackrel{?}{=} 13$ ← Check your solution. Replace y with 91.

$13 = 13$ ✓

y						
13	13	13	13	13	13	13

Drawing a diagram can help you solve a problem.

State whether the given number is a solution to the equation.

1. $3g = 56; g = 12$ _____

2. $t \div 8 = 2; t = 4$ _____

3. $6 = r \div 9; r = 54$ _____

Solve each equation. Then check each solution.

4. $4y = 64$

$4y \div \_\_ = 64 \div \_\_$

$y = \_\_$

Check:

5. $n \div 9 = 12$

$n \div 9 \times \_\_ = 12 \times \_\_$

$n = \_\_$

Check:

6. $23p = 115$ _____

7. $z \div 11 = 11$ _____

8. $66 = 3s$ _____

9. $34 = t \div 14$ _____