

Name \_\_\_\_\_

Operations and Algebraic Thinking  
3.OA.5, 3.OA.7

CCSS

# MY Homework

## Lesson 1

Hands On: Take Apart to Multiply

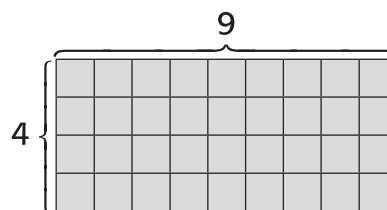
### Homework Helper



Need help? [connectED.mcgraw-hill.com](http://connectED.mcgraw-hill.com)

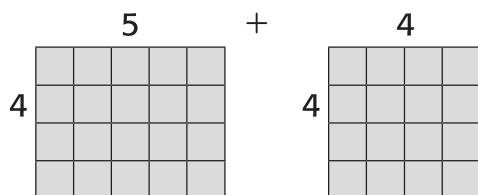
Find  $4 \times 9$ .

**1** Make an array to model  $4 \times 9$ .



**2** Decompose one factor.

Take apart the 9 to make 5 and 4.



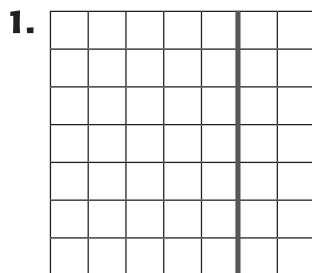
**3** Find the product for each part.

$$\begin{aligned} 4 \times 9 &= (4 \times 5) + (4 \times 4) \\ &= 20 + 16 \\ &= 36 \end{aligned}$$

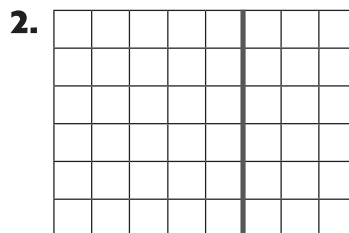
So,  $4 \times 9 = 36$ .

### Practice Sample decompositions: 1, 2

Decompose one factor. Color the array two colors to represent your numbers. Then find the product for each part and add.



$$\begin{aligned} 7 \times 7 &= (7 \times 5) + (7 \times 2) \\ &= 35 + 14 \\ &= 49 \end{aligned}$$



$$\begin{aligned} 6 \times 8 &= (6 \times 5) + (6 \times 3) \\ &= 30 + 18 \\ &= 48 \end{aligned}$$

**Decompose one factor. Find each product. Then add. Decompose the fact a different way below. Sample decompositions: 3, 4**

$$\begin{aligned} 3. \quad 8 \times 8 &= (8 \times \underline{5}) + (8 \times \underline{3}) \\ &= \underline{40} + \underline{24} \\ &= \underline{64} \end{aligned}$$

Another way:

$$\begin{aligned} 8 \times 8 &= (8 \times \underline{4}) + (8 \times \underline{4}) \\ &= \underline{32} + \underline{32} \\ &= \underline{64} \end{aligned}$$

$$\begin{aligned} 4. \quad 5 \times 7 &= (5 \times \underline{5}) + (5 \times \underline{2}) \\ &= \underline{25} + \underline{10} \\ &= \underline{35} \end{aligned}$$

Another way:

$$\begin{aligned} 5 \times 7 &= (5 \times \underline{3}) + (5 \times \underline{4}) \\ &= \underline{15} + \underline{20} \\ &= \underline{35} \end{aligned}$$



## Problem Solving

**Decompose one factor. Find each product. Then add.**

- 5. PRACTICE** **Identify Structure** Orlando's baby sister takes 3 naps a day. How many naps does she take in 9 days?

**27 naps**

- 6.** Carli gets to the bus stop 5 minutes early each morning. How many minutes does she wait at the bus stop in 5 days?

**25 minutes**

- 7.** Every Monday, Wednesday, and Friday, Mr. Brennan walks 2 miles and jogs 4 miles. What is the total number of miles Mr. Brennan walks and jogs in two weeks?

**36 miles**

*My Work!*

Name \_\_\_\_\_

Operations and Algebraic Thinking  
3.OA.5, 3.OA.7

CCSS

# MY Homework

## Lesson 2

### The Distributive Property

## Homework Helper



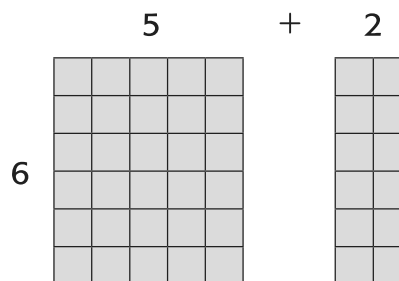
Need help? [connectED.mcgraw-hill.com](http://connectED.mcgraw-hill.com)

Melanie ran 6 laps around a track each day for 7 days.  
How many laps did Melanie run that week?

Find  $6 \times 7$ .

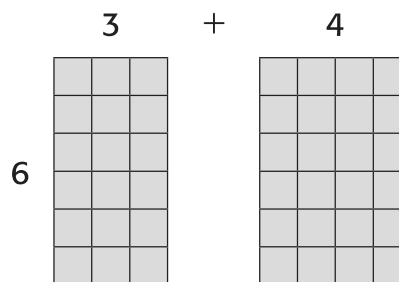
**One Way Decompose 7 into  $5 + 2$ .**

$$\begin{aligned} 6 \times 7 &= (6 \times 5) + (6 \times 2) \\ &= 30 + 12 \\ &= 42 \end{aligned}$$



**Another Way Decompose 7 into  $3 + 4$ .**

$$\begin{aligned} 6 \times 7 &= (6 \times 3) + (6 \times 4) \\ &= 18 + 24 \\ &= 42 \end{aligned}$$



$$6 \times 7 = 42$$

So, Melanie ran 42 laps in one week.

## Practice

Use the Distributive Property to find each product.

1.  $4 \times 9 = \underline{36}$

2.  $5 \times 6 = \underline{30}$

Use the Distributive Property to find each product.

3.  $5 \times 11 =$  55


4.  $12 \times 7 =$  84



## Problem Solving

5. Milly bought 4 bags of apples at the grocery store. Each bag contains 6 apples. How many apples does Milly have in all?

24 apples

6. **Mathematical PRACTICE**  **Identify Structure** Byron scrambled 8 dozen eggs for the campers. What is the total number of eggs Byron scrambled? (*Hint: 1 dozen = 12*)

96 eggs

7. There are 6 seats in each row in the theater. If 8 rows are filled with people, how many people are in the theater?

48 people

## Vocabulary Check



8. Explain how you could use the Distributive Property to decompose a factor and find the product of  $5 \times 9$ .

**Sample answer: You could decompose 9 into  $5 + 4$ . Use the Distributive Property to find  $(5 \times 5) + (5 \times 4) = 25 + 20 = 45$ .**

## Test Practice

9. Which shows the correct use of the Distributive Property to find  $4 \times 12$ ?

(A)  $(2 \times 6) + (2 \times 6)$

(C)  $(4 \times 6) + (2 \times 6)$

(B)  $(4 \times 10) + (4 \times 2)$

(D)  $(4 \times 8) + (4 \times 3)$

# MY Homework

## Lesson 3

### Hands On: Multiply Three Factors

## Homework Helper



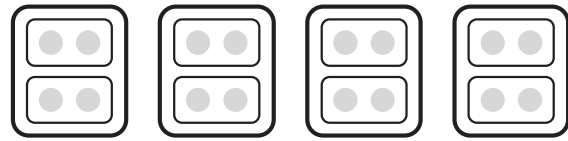
Need help? [connectED.mcgraw-hill.com](http://connectED.mcgraw-hill.com)

**Lois does 2 loads of laundry 2 times each week. How many loads of laundry does Lois do in 4 weeks?**

**1**

**Model  $(2 \times 2) \times 4$ .**

2 groups of 2, four times



$2 \times 2$

$2 \times 2$

$2 \times 2$

$2 \times 2$

**2**

**Multiply the factors inside the parentheses first.**

$$\begin{array}{c} (2 \times 2) \times 4 \\ \swarrow \quad \searrow \\ 4 \quad \times \quad 4 \\ \swarrow \quad \searrow \\ 16 \end{array}$$

**3**

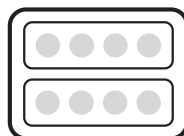
**Multiply the product by the remaining factor.**

So,  $(2 \times 2) \times 4 = 16$ . Lois does 16 loads of laundry in 4 weeks.

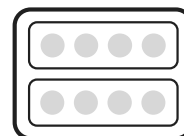
You can also group the factors another way.

$2 \times (2 \times 4)$

2 groups of 4, two times



$2 \times 4$



$2 \times 4$

$$\begin{array}{c} 2 \times (2 \times 4) \\ \swarrow \quad \searrow \\ 2 \quad \times \quad 8 \\ \swarrow \quad \searrow \\ 16 \end{array}$$

Either way you group the factors, the product is 16.

## Practice

**Find each product.**

1.  $(3 \times 1) \times 2 = \underline{6}$

2.  $(2 \times 2) \times 5 = \underline{20}$

Find each product.

3.  $(6 \times 1) \times 3 = \underline{18}$

4.  $3 \times (5 \times 2) = \underline{30}$

Group the factors another way. Then find each product.

5.  $(4 \times 1) \times 2 = 4 \times (1 \times \underline{2})$

$$\begin{array}{c} \downarrow \quad \swarrow \searrow \\ = 4 \times \underline{2} \\ \swarrow \searrow \\ = \underline{8} \end{array}$$

6.  $(2 \times 6) \times 2 = 2 \times (\underline{6} \times \underline{2})$

$$\begin{array}{c} \downarrow \quad \swarrow \searrow \\ = 2 \times \underline{12} \\ \swarrow \searrow \\ = \underline{24} \end{array}$$

7.  $3 \times (5 \times 1) = (\underline{3} \times \underline{5}) \times 1$

$$\begin{array}{c} \swarrow \searrow \quad \downarrow \\ = \underline{15} \times 1 \\ \swarrow \searrow \\ = \underline{15} \end{array}$$

8.  $(4 \times 5) \times 2 = 4 \times (\underline{5} \times \underline{2})$

$$\begin{array}{c} \downarrow \quad \swarrow \searrow \\ = 4 \times \underline{10} \\ \swarrow \searrow \\ = \underline{40} \end{array}$$



## Problem Solving

Mathematical

9. **PRACTICE 2 Use Number Sense** Caroline baked bread each day for 5 days for a bake sale. She baked 3 types of bread each day and used 2 cups of flour for each recipe. How many cups of flour did Caroline use?

**30 cups**

10. Each of the 4 members of the Kings Chess Club play in 3 matches both Saturday and Sunday. How many matches did the chess club play in all?

**24 matches**

11. Kent works at an ice cream shop. A family of 3 ordered 3 scoops of ice cream each. Then two more families of 3 ordered 3 scoops of ice cream each. How many scoops of ice cream did Kent serve to the three families in all?

**27 scoops**

My Work!

# MY Homework

## Lesson 4

### The Associative Property

## Homework Helper



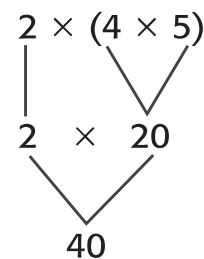
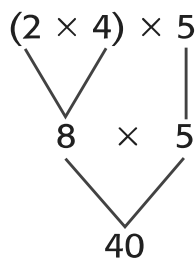
Need help? [connectED.mcgraw-hill.com](http://connectED.mcgraw-hill.com)

**Taylor and his friend bought 2 small pizzas. They cut each pizza into 4 pieces. Taylor put 5 black olives on each piece of pizza. How many black olives did Taylor use in all?**

Find  $2 \times 4 \times 5$ . Use parentheses to group the factors.

**One Way Multiply 2 and 4 first.**

**Another Way Multiply 4 and 5 first.**



Taylor used 40 black olives in all.

Either way you group the factors, the product is 40.

The Associative Property states that the way factors are grouped does not change the product.

## Practice

Use parentheses to group two factors. Then find each product.

1.  $2 \times 3 \times 6 = \underline{36}$

2.  $5 \times 2 \times 2 = \underline{20}$

## Algebra Find each missing factor.

3.  $4 \times (\blacksquare \times 4) = 32$

The unknown is 2.

4.  $(2 \times \blacksquare) \times 6 = 60$

The unknown is 5.

5.  $(5 \times \blacksquare) \times 1 = 45$

The unknown is 9.

6.  $\blacksquare \times (4 \times 2) = 48$

The unknown is 6.



## Problem Solving

Mathematical

7. **PRACTICE**  **Use Number Sense** Mariette bought 4 packs of sparkling water. There were 6 bottles in each pack. If each bottle cost \$2, how much did Mariette spend on sparkling water?

\$48

8. Jamal and Brianna each bought 3 oranges. They sliced each orange into 6 pieces. How many orange slices did Jamal and Brianna have altogether?

36 orange slices

9. Mr. and Mrs. Perry packed their lunch 5 days in a row. Each of them packed 3 oatmeal cookies for dessert every day. What is the total number of cookies they packed for lunch that week?

30 cookies

## Vocabulary Check



10. Write a definition for the Associative Property of Multiplication.

**Sample answer:** The Associative Property of Multiplication states that the way factors are grouped does not change the product.

## Test Practice

11. What is the unknown in  $(3 \times 3) \times 7 = \blacksquare$

(A) 21

(C) 42

(B) 30

(D) 63



Name \_\_\_\_\_

# MY Homework

## Lesson 5

### Write Expressions

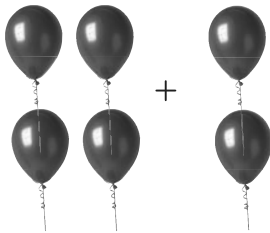
## Homework Helper



Need help? [connectED.mcgraw-hill.com](http://connectED.mcgraw-hill.com)

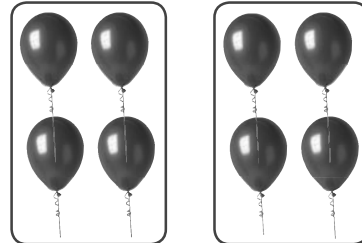
Charles filled 4 balloons for the party. Model each of the following situations with pictures, numbers, and words.

Charles filled 2 more balloons.



Numbers:  $4 + 2$   
Words: four plus two

Charles filled twice as many balloons.



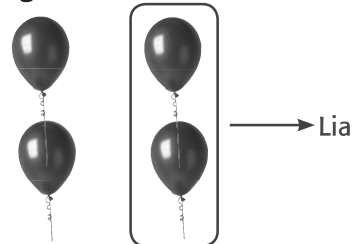
Numbers:  $4 \times 2$   
Words: four times two

One balloon floats away.



Numbers:  $4 - 1$   
Words: one less than four

Charles gives half of the balloons to Lia.

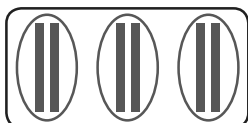


Numbers:  $4 \div 2$   
Words: half of four

## Practice

- Annette has 6 pencils. She divides them evenly among 3 friends. Model the expression with a picture, numbers, and words.

Picture



Numbers

$$6 \div 3$$

Words

six divided  
by three

Use numbers and operations to write each phrase as an expression.

2. 4 boxes with 2 shoes in each

$$4 \times 2$$

3. the difference between 58 and 47

$$58 - 47$$

4. 5 more than 12

$$12 + 5$$

5. 30 books shared equally by 10 people

$$30 \div 10$$



## Problem Solving

Mathematical  
**PRACTICE**



**Model Math** Write an expression for each situation.

6. Stella read all but one of the 5 books she took on vacation.

$$5 - 1$$

7. Ms. Benson had a box of 8 popsicles. She bought another box of 4 popsicles. Ms. Benson divided the popsicles among her 2 children.

$$(8 + 4) \div 2$$

8. Frieda bought 3 packs of 8 candles. Then she found 1 candle at home.

$$(3 \times 8) + 1$$

## Vocabulary Check



Match each vocabulary word with its example.

9. expression  $7 \times 4$

10. operations  $+, -, \times, \text{ and } \div$

## Test Practice

11. Zoe had 9 bracelets. She lost 1 and gave 3 to Blaire. Which expression matches the situation?

(A)  $9 - 3$

(C)  $9 - 1 - 3$

(B)  $(9 - 1) + (9 - 3)$

(D)  $(9 - 1) + 3$

Name \_\_\_\_\_

# MY Homework

## Lesson 6

### Evaluate Expressions

## Homework Helper



Need help? [connectED.mcgraw-hill.com](http://connectED.mcgraw-hill.com)

Kevin used half of the tools from his toolbox. An hour later he put 3 tools back. How many tools is Kevin still using if he had  $z$  tools in his toolbox? Write an expression. Then evaluate the expression if  $z = 8$ .

Write the expression.

$$z \div 2 - 3$$

Replace  $z$  with 8.

$$\begin{array}{c} 8 \div 2 - 3 \\ \swarrow \quad \searrow \\ 4 - 3 \\ \swarrow \quad \searrow \\ 1 \end{array}$$

When there are no parentheses, first multiply or divide, in order, from left to right.

Kevin is still using 1 tool.

## Practice

**Algebra** Evaluate each expression if  $c = 4$  and  $d = 7$ .

1.  $15 - d$

$$15 - \underline{7} = \underline{8}$$

2.  $16 + c$

$$16 + \underline{4} = \underline{20}$$

3.  $35 \div d$

$$35 \div \underline{7} = \underline{5}$$

**Algebra** Evaluate each expression if  $x = 14$  and  $y = 6$ .

4.  $(x + y) \div 4$

$$\begin{array}{c} (14 + 6) \div 4 \\ \swarrow \quad \searrow \\ 20 \div 4 = 5 \end{array}$$

5.  $x - 2 \times 2$

$$\begin{array}{c} 14 - 2 \times 2 \\ \swarrow \quad \searrow \\ 14 - 4 = 10 \end{array}$$

6.  $y + 24 \div 2$

$$\begin{array}{c} 6 + 24 \div 2 \\ \swarrow \quad \searrow \\ 6 + 12 = 18 \end{array}$$



## Problem Solving

Mathematical  
**PRACTICE**



**Model Math** Write an expression for each situation. Then evaluate it.

7. Monica has 7 hats. Andrea has  $b$  fewer hats than Monica. If  $b = 5$ , how many hats does Andrea have?

$7 - b$ ;  $7 - 5 = 2$  hats

8. There are 4 shelves with canned dog food. Each shelf has  $t$  cans. Then Tracy adds 2 cans to only 1 of the shelves. If  $t = 8$ , how many cans are on the shelves altogether?

$4 \times t + 2$ ;  $4 \times 8 + 2 = 34$  cans

9. Valerie is making identical quilts for herself and her sister. For each quilt she buys 5 yards of solid fabric and  $w$  yards of printed fabric. If  $w = 4$ , how much fabric did Valerie buy to make both quilts?

$(5 + w) \times 2$ ;  $(5 + 4) \times 2 = 18$  yards

Sample answers: 10, 11

## Vocabulary Check



10. Explain what a variable is.

A variable is a symbol or letter that stands for an unknown.

11. What does it mean to evaluate an expression?

To evaluate an expression means to replace a variable with a number in order to find its value.

## Test Practice

12. Evaluate the expression  $h + 8 \div 4$  if  $h = 16$ .

(A) 20

(C) 8

(B) 18

(D) 6

Name \_\_\_\_\_

# MY Homework

## Lesson 7

### Write Equations

## Homework Helper



Need help? [connectED.mcgraw-hill.com](http://connectED.mcgraw-hill.com)

Use the numbers in the table to write an equation for each situation. Use  $x$  for the unknown.

Sammy's Pets	
Fish	12
Hamsters	4
Dogs	2
Birds	3

The difference between the number of fish and the number of birds is  $x$ .

$$12 - 3 = x$$

The total number of pets is  $x$ .

$$12 + 4 + 2 + 3 = x$$

Two times the number of hamsters minus  $x$  equals the number of dogs.

$$2 \times 4 - x = 2$$

The number of fish grouped equally into three aquariums is  $x$ .

$$12 \div 3 = x$$

## Practice

**Algebra** Write an equation to represent each sentence.

1. Five more than 7 shells is  $s$ .

$$7 + 5 = s$$

2. Four times as many as 4 pencils is  $p$ .

$$4 \times 4 = p$$

3. Half as many as 18 squirrels is  $x$ .

$$18 \div 2 = x$$

4. Eleven spoons minus  $s$  equals 9 spoons.

$$11 - s = 9$$

## Algebra Write an equation to represent each sentence.

5. 3 more than 14 eggs divided into 2 equal groups is  $e$ .

$$14 \div 2 + 3 = e$$

7. The total of 13 cherries, 8 more cherries, and 2 more cherries is  $c$ .

$$13 + 8 + 2 = c$$

6. 5 boxes of muffins with  $m$  number in each box equals 30.

$$5 \times m = 30$$

8. 32 tennis balls shared equally by 4 players plus 3 more is  $b$ .

$$32 \div 4 + 3 = b$$



## Problem Solving

Mathematical  
**PRACTICE**



**Use Algebra** Write an equation using any letter for the unknown.

9. Irving paid for his lunch with a \$10 bill and got \$6 back in change. How much did his lunch cost?

$$\$10 - x = \$6$$

10. Erin's beagle weighs 35 pounds. Her Great Dane weighs twice as much as the beagle plus 2 more pounds. How much does the Great Dane weigh?

$$2 \times 35 + 2 = x$$

## Vocabulary Check



11. Explain the difference between an expression and an equation.

**Sample answer: An expression does not have an equals sign, but an equation does.**

## Test Practice

12. Venus bought 3 loaves of bread that have 20 slices each. Then she used 2 slices to make a sandwich. There are  $b$  slices left. Which equation represents the situation?

☒ A  $3 \times 20 - 2 = b$

☐ C  $(3 \times 20) \div 2 = b$

☐ B  $3 + 20 - 2 = b$

☐ D  $3 + 20 - b = 2$

Name \_\_\_\_\_

# MY Homework

## Lesson 8

### Solve Two-Step Word Problems

## Homework Helper



Need help? [connectED.mcgraw-hill.com](http://connectED.mcgraw-hill.com)

**Talia picked 8 quarts of strawberries. She picked half as many quarts of blueberries, then bought 1 more quart of blueberries. How many quarts of blueberries does Talia have?**

Write an equation with a letter for the unknown. Then solve.

strawberries picked		blueberries picked		blueberries bought		
8	÷	2	+	1	=	$q$ ← unknown
		4		1	=	5

So,  $8 \div 2 + 1 = 5$ . The unknown is 5. Talia has 5 quarts of blueberries.

**Check** Use mental math to check your answer for reasonableness.

Subtract the one quart Talia bought from the total.

$5 - 1 = 4$  and 4 is half of 8.

The numbers make sense for the problem. The answer is reasonable.

## Practice

**Algebra** Find each unknown.

1.  $48 \div 6 + m = 11$

$m = \underline{3}$

2.  $37 - 9 = h \times 4$

$h = \underline{7}$

3.  $20 + 20 = 4 \times w$

$w = \underline{10}$

4.  $(4 + 2) \times r = 54$

$r = \underline{9}$



## Problem Solving Sample equations: 5–8

Mathematical  
**PRACTICE**



**Check for Reasonableness Write an equation with a letter for the unknown. Then solve. Check for reasonableness.**

5. The football team had its photo taken. There are 3 rows of 8 players each. The fourth row has 6 players. How many players are in the team photo?

$$3 \times 8 + 6 = p; 3 \times 8 + 6 = 30 \text{ players}$$

6. Mrs. Dove made 15 pancakes. She divided them evenly among Kurt, Joan, and David. Kurt and Joan ate all of their pancakes, but David did not eat some of his. There were 2 pancakes left on David's plate. How many pancakes did he eat?

$$15 \div 3 - x = 2; 15 \div 3 - 3 = 2; \text{David ate 3 pancakes.}$$

7. Keira has 83 spelling words to study in 8 weeks. She already knows 3 words. She will study the same number of words each week. How many spelling words will Keira study each week?

$$(83 - 3) \div 8 = s; (83 - 3) \div 8 = 10 \text{ spelling words}$$

8. Grant bought 6 packs of stickers for \$2 each. How much change will Grant receive if he pays with three \$5 bills?

$$(3 \times \$5) - (6 \times \$2) = c; \$15 - \$12 = \$3 \text{ change}$$

## Test Practice

9. Isaac has taken five quizzes. He scored 8 points on each of the first 4 quizzes. He scored  $y$  points on the fifth quiz. He has scored a total of 41 points. Which equation represents the situation?

(A)  $41 \div 5 = y$

(C)  $4 \times 8 + y = 41$

(B)  $8 \times 4 \div 5 = y$

(D)  $41 \div 4 + y = 8$



# MY Homework

## Lesson 9

### Problem Solving: Use Logical Reasoning

## Homework Helper



Need help? [connectED.mcgraw-hill.com](http://connectED.mcgraw-hill.com)

Sarah, Parker, Kelly, and Nate each have favorite outfits. Nate wears shorts or pants. Parker always wears something green. Sarah wears shorts, but does not like the color blue. Kelly never wears shorts. Which clothing item could belong to each person?



### 1 Understand

What facts do you know?

I know the clothes and colors each person would wear.

What do you need to find?

I need to find which clothing item belongs to each person.

### 2 Plan

I will use logical reasoning to solve the problem.

### 3 Solve

	Red Shorts	Blue Shorts	Green Pants	Brown Pants
Sarah	yes	X	X	X
Parker	X	X	yes	X
Kelly	X	X	X	yes
Nate	X	yes	X	X

The red shorts could belong to Sarah, the blue shorts to Nate, the green pants to Parker, and the brown pants to Kelly.

### 4 Check

Does your answer make sense? Yes. The clues match the answer.



# Problem Solving

Mathematical  
**PRACTICE**



**Reason** Solve each problem using logical reasoning.

1. Granola bars cost 45¢, gum costs 35¢, and crackers cost 50¢. Lauren buys two different items. She pays with a \$1 bill and receives 3 of the same type of coin as change. What did Lauren buy, and what did she receive as change?

**Lauren bought gum and crackers and received 3 nickels as change.**

2. There are four cars parked next to each other. The blue car is not in the fourth space. The silver car is in the third space. The black car is two spaces in front of the red car. In what order are the cars parked?

**blue, black, silver, red**

3. There are 21 wheels at the bike shop. The wheels will be used to build tricycles and bicycles. There will be half as many tricycles as bicycles. How many of each type of bike will be built?

**3 tricycles and 6 bicycles**

4. Mitchell has \$18 to spend. What is the greatest number of any one item he can buy?

cap	\$9
baseball	\$10
stopwatch	\$9
yo-yo	\$6
water bottle	\$3

**6 water bottles**

My Work!

