

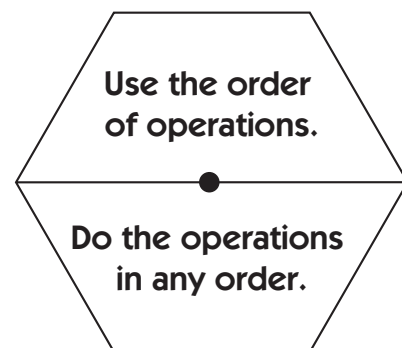
NAME \_\_\_\_\_

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## Home Connection 59 ★ Activity

### The Operations Game

Cut out the cards on pages 217–221. Fasten the cards to this assignment with a paperclip. Follow the directions below to play the game twice at home and then bring the record sheets back to school.



### Instructions for The Operations Game

- 1** Mix up the cards and place them face down in a stack. Then decide which player will start.
  - 2** The first player draws a card from the top of the stack and copies the equation on his or her side of the Game 1 Record Sheet.
  - 3** Then the second player follows step 2.
  - 4** Player 1 uses a pencil and paperclip to spin the spinner above. If the paperclip lands on top, both players will have to use the order of operations. If the paperclip lands on the bottom, players can do the operations in any order to get the largest possible result.
  - 5** Both players solve their equations at the same time, following the guidelines set by the spinner. If you get to do the operations in any order, mark your equations with parentheses to show how you did it. Either way, the answer is your score for this turn. You can do your figuring on the record sheet or use a piece of scratch paper.
  - 6** Share your answers with each other to make sure you both agree they are correct.
  - 7** Continue to take your turns at the same time until you've filled the record sheet. When you're finished, each player adds up his or her answers and enters his or her total score at the bottom of the sheet. The player with the highest score wins.
- Note** Once you've used a card, do not return it to the stack. You should be able to use all of the cards once by playing two games.

#### Order of Operations

1. If there are parentheses, do whatever is inside them first.
2. Multiply and divide from left to right.
3. Add and subtract from left to right.

(Continued on next page.)

**Home Connection 59** Activity (cont.)

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Home Connection 59 Activity (cont.)

The Operations Game Cards page 1 of 3

$$5 + 9 \times 3 =$$

HC 59 The Operations Game Card

$$15 \div 3 + 2 \times 5 =$$

HC 59 The Operations Game Card

$$10 \times 7 - 12 \times 5 =$$

HC 59 The Operations Game Card

$$7 \times 6 - 4 \times 2 =$$

HC 59 The Operations Game Card

$$4 + 2 \times 5 - 12 \div 6 =$$

HC 59 The Operations Game Card

$$12 - 4 \times 3 =$$

HC 59 The Operations Game Card

$$13 - 6 \div 2 + 1 =$$

HC 59 The Operations Game Card

$$48 \div 4 - 3 + 1 \times 5 =$$

HC 59 The Operations Game Card

Home Connection 59 Activity (cont.)



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Home Connection 59 Activity (cont.)

The Operations Game Cards page 2 of 3

$$24 + 8 \div 4 - 6 + 14 = \square$$

HC 59 The Operations Game Card

$$7 \times 8 - 6 \times 9 = \square$$

HC 59 The Operations Game Card

$$6 + 4 \times 5 = \square$$

HC 59 The Operations Game Card

$$36 \div 4 + 2 \times 7 = \square$$

HC 59 The Operations Game Card

$$5 \times 6 - 3 = \square$$

HC 59 The Operations Game Card

$$8 \times 8 - 6 \times 6 = \square$$

HC 59 The Operations Game Card

$$7 + 7 \times 5 = \square$$

HC 59 The Operations Game Card

$$25 - 3 \times 7 = \square$$

HC 59 The Operations Game Card

Home Connection 59 Activity (cont.)



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Home Connection 59 Activity (cont.)

The Operations Game Cards page 3 of 3

$$17 - 4 \times 3 = \square$$

HC 59 The Operations Game Card

$$12 \div 6 - 3 + 2 \times 6 = \square$$

HC 59 The Operations Game Card

$$6 \times 3 + 7 - 1 \times 4 = \square$$

HC 59 The Operations Game Card

$$14 \times 3 + 7 \times 3 = \square$$

HC 59 The Operations Game Card

Home Connection 59 Activity (cont.)



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**Home Connection 59** Activity (cont.)**NOTE TO FAMILIES**

Here are two ways to solve  $8 \times 5 - 3 \times 6$ . Using order of operations, you can only get one answer for  $8 \times 5 - 3 \times 6$ . You have to do the multiplication first and then the subtraction, so  $8 \times 5 = 40$  and  $3 \times 6 = 18$ , and then subtract to get  $40 - 18 = 22$ .

If you get to do the operations in any order you want, you can get lots of different answers for  $8 \times 5 - 3 \times 6$ . Try to find the highest answer to get the best score. Remember to use parentheses to show what order you used. Example:  $((8 \times (5 - 3)) \times 6 = 8 \times 2 \times 6$  and  $8 \times 2 \times 6 = 96$

**Game 1 Record Sheet**

Player 1:	Player 2:
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
Player 1 Total Score:	Player 2 Total Score:

(Continued on back.)

## Home Connection 59 Activity (cont.)

Game 2 Record Sheet	
Player 1:	Player 2:
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
Player 1 Total Score:	Player 2 Total Score:

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# Home Connection 60 ★ Worksheet

## Operations, Equations & Puzzles

### Order of Operations

1. If there are parentheses, do whatever is inside them first.
2. Multiply and divide from left to right.
3. Add and subtract from left to right.

**1** Find the answer to each problem below. Use the standard order of operations, and show the steps you use.

**example**  $3 + 4 \times 2 - 1$   
 $3 + 8 - 1 = 10$

**a**  $15 \div 5 + 4$

**b**  $14 + 5 \times 3$

**c**  $(9 - 3) \times 5 + 8$

**d**  $2 + 24 \div 12 - 3$

**e**  $17 - 2 \times 7 + 21$

**2** Circle the word to show whether each equation below is true or false.

**a**  $29 + 7 = 6 \times 6$       True    False

**b**  $5 \times 2 \times 4 = 4 \times 5 \times 2$       True    False

**c**  $12 \times (10 - 2) = (12 \times 10) - 2$       True    False

**d**  $20 = 2n + 10$  if the value of  $n$  is 5.      True    False

(Continued on back.)

## Home Connection 60 Worksheet (cont.)

**3** Write the correct number in each box to complete the equations. Find at least two different ways to complete equations b and e.

**a**  $18 = 1 \times 12 + \square$

**b**  $4 \times \square = 2 \times \square$

$4 \times \square = 2 \times \square$

**c**  $3 \times \square - 8 = 2 \times 2$

**d**  $15 \div \square = 7 - 4$

**e**  $24 \div \square = 16 \div \square$

$24 \div \square = 16 \div \square$

<p><b>4</b> <math>A \div 2 = 6</math></p> <p><math>A - B = 8</math></p> <p><math>(A + B) \div C = 2</math></p>	<p><b>5</b> <math>60 - A = 20</math></p> <p><math>A \div B = 8</math></p> <p><math>(A - B) \div C = 5</math></p>
<p><math>A = \underline{\quad}</math>      <math>B = \underline{\quad}</math>      <math>C = \underline{\quad}</math></p>	<p><math>A = \underline{\quad}</math>      <math>B = \underline{\quad}</math>      <math>C = \underline{\quad}</math></p>
<p><b>6</b> <math>A \times 3 = 21</math></p> <p><math>A - B = 3</math></p> <p><math>(A + B) \times C = 66</math></p>	<p><b>7</b> <math>75 + 25 = A</math></p> <p><math>A \div B = 10</math></p> <p><math>(A - B) \times C = 45</math></p>
<p><math>A = \underline{\quad}</math>      <math>B = \underline{\quad}</math>      <math>C = \underline{\quad}</math></p>	<p><math>A = \underline{\quad}</math>      <math>B = \underline{\quad}</math>      <math>C = \underline{\quad}</math></p>

(Continued on next page.)

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**Home Connection 60** Worksheet (cont.)

Solve the problems below without a calculator.

$$\begin{array}{r} \mathbf{8} \quad 65 \\ \times 32 \\ \hline \end{array}$$

$$\begin{array}{r} \mathbf{9} \quad 132 \\ \times 56 \\ \hline \end{array}$$

$$\begin{array}{r} \mathbf{10} \quad 112 \\ \times 87 \\ \hline \end{array}$$

$$\mathbf{11} \quad 16 \overline{)589}$$

$$\mathbf{12} \quad 16 \overline{)412}$$

$$\mathbf{13} \quad 25 \overline{)928}$$

(Continued on back.)

## Home Connection 60 Worksheet (cont.)



## CHALLENGE

**14**  $3 \times A = 39$

$A \times B = 65$

$(A - B) \times C = 96$

$(A + B - C) \times D = 120$

$A = \underline{\quad}$   $B = \underline{\quad}$   $C = \underline{\quad}$   $D = \underline{\quad}$

**15**  $A + 15 = 30$

$A \times B = 45$

$(A + B) \div C = 3$

$(A + B) - (C \times D) = 0$

$A = \underline{\quad}$   $B = \underline{\quad}$   $C = \underline{\quad}$   $D = \underline{\quad}$

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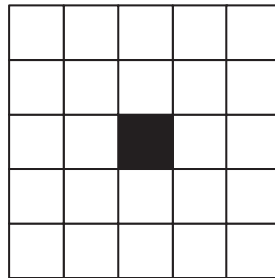
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# Home Connection 61 ★ Worksheet

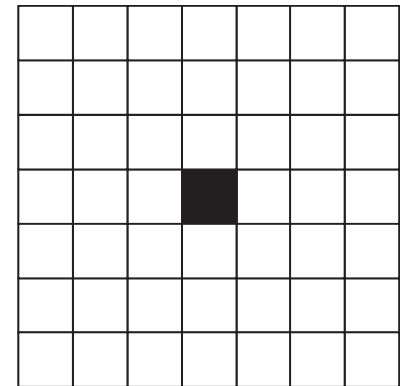
## More Tile Patterns

Below are parts of two different tile sequences. For each sequence, sketch the missing arrangement. Then use words, numbers, and your sketches to describe how the arrangements change from one to the next. (Or give a rule that tells how to make any arrangement in the sequence.)

**1a** Sketch the first arrangement.



Arrangement 2



Arrangement 3

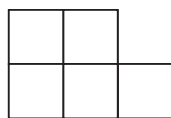
Arrangement 1

**b** Description or Rule:

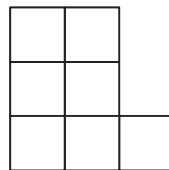
**2a** Sketch the fourth arrangement.



Arrangement 1

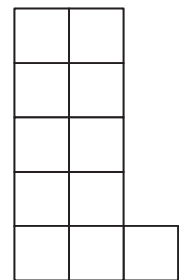


Arrangement 2



Arrangement 3

Arrangement 4



Arrangement 5

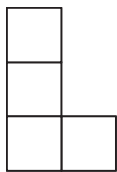
**b** Description or Rule:

(Continued on back.)

## Home Connection 61 Worksheet (cont.)

Below are descriptions of two different tile sequences. For each, you are given the first arrangement and then a rule that tells you how to make the rest of the arrangements in the sequence. Sketch arrangements 2 through 4 for each sequence.

**3** Rule: Add 3 to the arrangement number. (It takes 4 tile to make the first arrangement because  $1 + 3 = 4$ .)



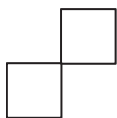
Arrangement 1

Arrangement 2

Arrangement 3

Arrangement 4

**4** Rule: Multiply the arrangement number times 2. (It takes 2 tile to make the first arrangement because  $2 \times 1 = 2$ .)



Arrangement 1

Arrangement 2

Arrangement 3

Arrangement 4

(Continued on next page.)

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**Home Connection 61** Worksheet (cont.)

Solve the problems below without a calculator.

$$\begin{array}{r} 5 \quad 36 \\ \times 27 \\ \hline \end{array}$$

$$\begin{array}{r} 6 \quad 113 \\ \times 62 \\ \hline \end{array}$$

$$\begin{array}{r} 7 \quad 207 \\ \times 35 \\ \hline \end{array}$$

$$8 \quad 62 \overline{)1146}$$

$$9 \quad 62 \overline{)826}$$

$$10 \quad 31 \overline{)843}$$

(Continued on back.)

## Home Connection 61 Worksheet (cont.)



## CHALLENGE

Think carefully about order of operations when doing the following puzzles.

<p><b>11</b> <math>\frac{A}{12} + \frac{5}{12} = 1</math></p> <p><math>A \times A + B = 55</math></p> <p><math>A \times B \div C = 14</math></p> <p><math>((B + C) \times A) \div D = 7</math></p>	<p><b>12</b> <math>2 \times 25 + A = 98</math></p> <p><math>A \div B + 3 = 7</math></p> <p><math>A + B \times C = 120</math></p> <p><math>(A \div C + B) \times D = 200</math></p>
<p>A = _____ B = _____ C = _____ D = _____</p>	<p>A = _____ B = _____ C = _____ D = _____</p>
<p><b>13</b> <math>3 \times 15 + A = 85</math></p> <p><math>A \div B + 4 = 24</math></p> <p><math>A + B \times C = 76</math></p> <p><math>(C \div B + A) \div D = 7</math></p>	<p><b>14</b> <math>A + 7 \times 7 = 54</math></p> <p><math>(A \times A) - (B \times B) = 9</math></p> <p><math>A \times B + (C \times C) = 56</math></p> <p><math>(C \times A + B) + (D \times D) = 98</math></p>
<p>A = _____ B = _____ C = _____ D = _____</p>	<p>A = _____ B = _____ C = _____ D = _____</p>

**15** In this box, make up your own algebra puzzle for someone else in your class to solve. Double check to make sure your puzzle works and write the answers in the key box. Then cover the key by taping a little flap over it.

Key

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## Home Connection 62 ★ Worksheet

### Thinking About *The King's Chessboard*

Here are the number of grains of rice that appeared on the first row of the king's chessboard.

Day 1	Day 2	Day 3	Day 4	Day 5	Day 6	Day 7	Day 8
1	2	4	8	16	32	64	128

**1** Using the information above, complete the following table. (The first part is filled out for you.)

<b>a</b> Total number of grains on days 1 and 2	Grains on day 3	<b>b</b> Total number of grains on days 1, 2 and 3	Grains on day 4
3	4		
<b>c</b> Total number of grains on days 1–4	Grains on day 5	<b>d</b> Total number of grains on days 1–5	Grains on day 6
<b>e</b> Total number of grains on days 1–6	Grains on day 7	<b>f</b> Total number of grains on days 1–7	Grains on day 8

**2** List at least 2 different patterns you notice when you look at the numbers in the tables above.

(Continued on back.)

## Home Connection 62 Worksheet (cont.)

**3** By the 12th day, the Weigher of the King's Grain got tired of counting out grains of rice and simply weighed out an ounce of rice to send to the wise man. On what day did the wise man get a full pound of rice? (There are 16 ounces in a pound.) Show your work.

**4** There are 2 cups of rice in a pound. When you cook rice, it swells up to 3 times its volume. Fill in the table below to show how many cups of cooked rice you get as the number of pounds increases.

Pounds of rice	1	2	3	4	5	6	10	20		100
Cups of raw rice	2		6			12		40	100	
Cups of cooked rice	6				30				300	

**5** What do you have to do to figure out how many cups of cooked rice you'll get from cooking *any* number of pounds? Give your answer in words, and then write an equation to match.

(Continued on next page.)

**Home Connection 62** Worksheet (cont.)

**6** It wasn't long before the wise man started receiving 128-pound sacks of rice from the king. How many cups of cooked rice would you get if you cooked the whole 128 pounds? Show your work.

**7** The wise man gave his sacks of rice to the people in the villages all around. In one village, they cooked one whole sack, all 128 pounds of it, and had a big party. Every single person in the whole village got 3 cups of cooked rice to eat. How many people were there in the village? Show your work.

**CHALLENGE**

**8** Near the end of the story, the Chief Mathematician figured out that to keep his promise, the king would have to give the wise man 274,877,906,944 tons of rice. A modern 18-wheeler truck can carry 45 tons at the most. How many 18-wheelers would it take to carry the promised amount of rice? Do your calculations by hand on the back of this page and bring them in to share with the class.



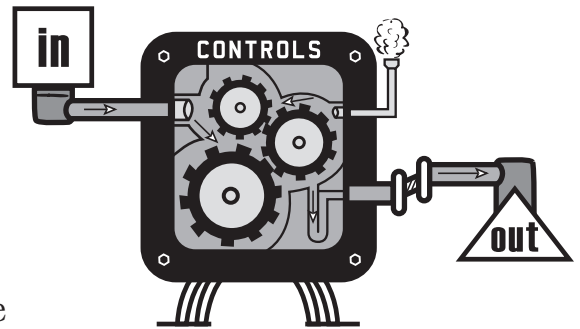
NAME \_\_\_\_\_

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# Home Connection 63 ★ Worksheet

## The Function Machine Strikes Again!

Here's the function machine with some more puzzles for you to solve. Use the clues to fill in the missing numbers on each chart. Describe a rule the machine could use to get the numbers in the chart. Then write an equation to describe that rule.



1a

in	out
10	5
8	3
4	
7	2
0	
	32
15	10
	47

2a

in	out
2	5
5	14
7	
10	
6	17
20	
100	299
	23

**b** The value of the output number is:

**b** The value of the output number is:

**c** Here's how to write the rule as an equation:

**c** Here's how to write the rule as an equation:

## Home Connection 63 ★ Activity

### The Function Machine Game

Play this game with an adult. You'll need a record sheet and a pencil to play.

I played this game with \_\_\_\_\_  
(your partner's signature)

### Instructions for The Function Machine Game

**1** Think of a mathematical rule for transforming numbers. Examples of rules would be *add 5*, *multiply by 3*, or *divide by 2 and then add 1*. You can get even more complicated if you want, as long as you think your partner can figure out your rule.

**2** On your record sheet, create a chart of input and output numbers. Fill in the first 3 lines. You get your output numbers by applying the rule to each input number. You don't have to start with 1 as your first input number and it is fine to skip numbers. Make sure you follow your own rule to get all the output numbers.

**3** Write an input number on the fourth line. If your partner guesses the output number correctly, he or she scores a point. If your partner guesses incorrectly, write the correct number yourself. Repeat this on the fifth line. Your partner scores a point if he or she guesses the output number correctly.

**4** Then ask your partner to guess your rule. If the guess is correct, your partner scores 5 points. If the guess is not correct, ask your partner to write his or her second guess on the record sheet. If it's correct, your partner scores 2 points. If it's not correct, write your rule on the third line for your partner to see. Keep in mind that your partner might see the rule differently than you do. If the rule he or she guesses works for every pair of input and output numbers, he or she gets the points.

**5** Now switch and try to guess your partner's rule. The player with the most points after 3 rounds is the winner. Record your scores at the bottom of the sheet. There is an extra record sheet if you want to play the game a second time before you bring the assignment back to school.

(Continued on next page.)

Home Connection 63 Activity (cont.)

PLAYER 1 \_\_\_\_\_

DATE \_\_\_\_\_

PLAYER 2 \_\_\_\_\_

**What's My Rule? Record Sheet 1**

<b>Round 1</b>			
Player 1's T-chart		Player 2's T-chart	
In	Out	In	Out
Guess 1 (5 points)		Guess 1 (5 points)	
Guess 2 (2 points)		Guess 2 (2 points)	
Player 1's Rule:		Player 2's Rule:	
<b>Round 2</b>			
Player 1's T-chart		Player 2's T-chart	
In	Out	In	Out
Guess 1 (5 points)		Guess 1 (5 points)	
Guess 2 (2 points)		Guess 2 (2 points)	
Player 1's Rule:		Player 2's Rule:	
<b>Round 3</b>			
Player 1's T-chart		Player 2's T-chart	
In	Out	In	Out
Guess 1 (5 points)		Guess 1 (5 points)	
Guess 2 (2 points)		Guess 2 (2 points)	
Player 1's Rule:		Player 2's Rule:	

Player 2's Score \_\_\_\_\_

Player 1's Score \_\_\_\_\_

## Home Connection 63 Activity (cont.)

PLAYER 1 \_\_\_\_\_

DATE \_\_\_\_\_

PLAYER 2 \_\_\_\_\_

## What's My Rule? Record Sheet 2

<b>Round 1</b>			
Player 1's T-chart		Player 2's T-chart	
In	Out	In	Out
Guess 1 (5 points)		Guess 1 (5 points)	
Guess 2 (2 points)		Guess 2 (2 points)	
Player 1's Rule:		Player 2's Rule:	
<b>Round 2</b>			
Player 1's T-chart		Player 2's T-chart	
In	Out	In	Out
Guess 1 (5 points)		Guess 1 (5 points)	
Guess 2 (2 points)		Guess 2 (2 points)	
Player 1's Rule:		Player 2's Rule:	
<b>Round 3</b>			
Player 1's T-chart		Player 2's T-chart	
In	Out	In	Out
Guess 1 (5 points)		Guess 1 (5 points)	
Guess 2 (2 points)		Guess 2 (2 points)	
Player 1's Rule:		Player 2's Rule:	

Player 2's Score \_\_\_\_\_ Player 1's Score \_\_\_\_\_

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# Home Connection 64 ★ Worksheet

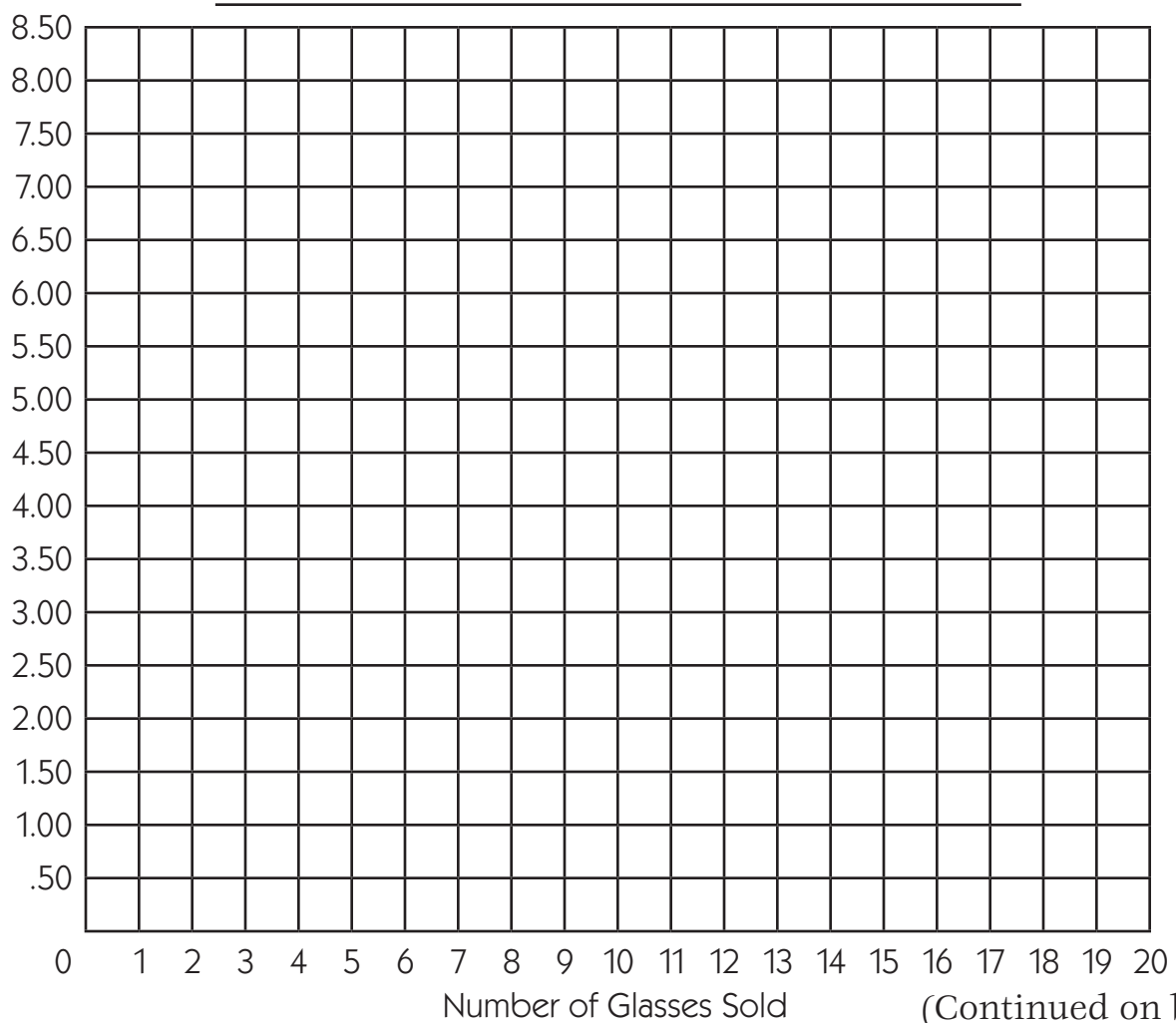
## The Lemonade Stand

Troy and his little sister are going to sell lemonade to earn money for the wildlife refuge near their home. Troy's parents have agreed to pay for the ingredients and the cups. The kids are going to charge 50¢ a glass for their lemonade.

**1** Fill in the table below to show how much money they'll earn.

Number of glasses sold	1	2	3		5		7	8	9	
Money earned	\$0.50		\$1.50			\$3.00				\$5.00

**2** Use the grid below to graph the amount of money they'll earn as they sell glasses of lemonade. Give your graph a good title.



## Home Connection 64 Worksheet (cont.)

**3** Why do the points on the graph form a straight line?

**4** The first day they opened their lemonade stand it was really hot. Troy and his sister sold 24 glasses of lemonade between noon and 3:00 pm. How much money did they make? Show your work.

**5** Between 1:00 pm and 5:00 pm on the second day, they made \$14.50. How many glasses of lemonade did they sell during those 4 hours? Show your work.



(Continued on next page.)

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**Home Connection 64** Worksheet (cont.)

**6** What do you have to do to figure out how much money they'll earn for selling any number of glasses of lemonade? Give your answer in words, and then write an equation to match.

**7** Their goal is to earn \$75.00 for the wildlife refuge. How many glasses of lemonade will they need to sell to reach their goal? Show your work.

(Continued on back.)

## Home Connection 64 Worksheet (cont.)

8 Here is a recipe for 1 glass of lemonade:

$1\frac{1}{2}$  tablespoons lemon juice

$\frac{1}{4}$  cup sugar

1 cup of water

The pitcher the kids were using held 8 glasses of lemonade. How much lemon juice, sugar, and water did it take to make enough lemonade to fill the pitcher? Show your work.

**CHALLENGE**

9 Use your answer to problem 7, along with the information below to figure out how much it cost Troy's parents to buy the ingredients for all the lemonade they sold. (The kids did reach their goal of earning \$75.00 exactly.) Show all of your work.

- A 1-quart bottle of lemon juice costs \$2.95.
- There are 16 tablespoons in a cup and 4 cups in a quart.
- A 5-pound bag of sugar costs \$3.29.
- There are  $11\frac{1}{4}$  cups of sugar in a 5-pound bag.

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# Home Connection 65 ★ Worksheet

## Picturing Problems

Here is the model we've been using to solve story problems in class for the last few days. The longer line segment is like the coffee stirrer and represents any number or a secret number. The shorter line segment is like the red linear unit, and always represents 1.



**example** Draw a collection below that is 4 more than a secret number.



- 1 Draw a collection below that is 7 more than the secret number.
  
- 2 Draw a collection below that is 2 *times* the secret number.
  
- 3 Draw a collection below that is 3 times the secret number plus 2.
  
- 4 Pretend that the secret number is worth 15. How would 17 look if you used the model shown above? Sketch it below.
  
- 5 The sum of two secret numbers is 24. Their difference is 6. What are the two secret numbers? Show all of your work below. See if you can use a strategy that is *not* random guess and check to solve this problem.

The two secret numbers are \_\_\_\_\_ and \_\_\_\_\_.

(Continued on back.)

## Home Connection 65 Worksheet (cont.)

**6a** A square has a perimeter of 72 centimeters. Make a labeled sketch of the square.

**b** Determine the length of each side of the square. Use words, numbers, and/or a labeled sketch to show how you got the answer.

**c** Each side of the square is \_\_\_ centimeters.

**7a** In the Brown family, the oldest sister is 2 years older than the middle sister. The middle sister is 3 years older than the youngest sister. The ages of all three sisters total 26 years. Make a labeled sketch to model this situation.

**b** Determine the ages of each sister. Use words, numbers, and/or a labeled sketch to show how you got the answer.

**c** The youngest sister is \_\_\_\_.  
The middle sister is \_\_\_\_ years old.  
The oldest sister is \_\_\_\_ years old.