

Study Links

Common Core Units 7-9

Everyday Math Grade 4



Name: _____

Teacher: _____

STUDY LINK
6•11

Unit 7: Family Letter

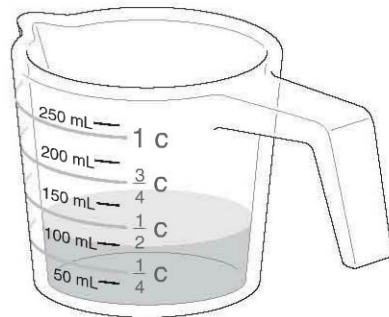


Fractions and Their Uses; Chance and Probability

One of the most important ideas in mathematics is the concept that a number can be named in many different ways. For example, a store might advertise an item at $\frac{1}{2}$ off its original price or at a 50% discount—both mean the same thing. Much of the mathematics your child will learn involves finding equivalent names for numbers.



A few weeks ago, the class studied decimals as a way of naming numbers between whole numbers. Fractions serve the same purpose. After reviewing the meaning and uses of fractions, students will explore equivalent fractions—fractions that have the same value, such as $\frac{1}{2}$, $\frac{2}{4}$, $\frac{3}{6}$, and so on. As in past work with fractions, students will handle concrete objects and look at pictures, because they first need to “see” fractions in order to understand what fractions mean.



A measuring cup showing fractional increments

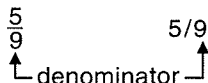
Fractions are also used to express the chance that an event will occur. For example, if we flip a coin, we say that it will land heads-up about $\frac{1}{2}$ of the time. The branch of mathematics that deals with chance events is called **probability**. Your child will begin to study probability by performing simple experiments.

Please keep this Family Letter for reference as your child works through Unit 7.

Vocabulary

Important terms in Unit 7:

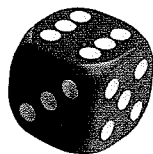
denominator The number below the line in a fraction. In a fraction where the whole is divided into equal parts, the denominator represents the number of equal parts into which the whole (or ONE or unit whole) is divided. In the fraction $\frac{a}{b}$, b is the denominator.



equal chance outcomes or equally likely outcomes If each of the possible outcomes for a chance experiment or situation has the same chance of occurring, the outcomes are said to have an equal chance or to be equally likely. For example, there is an equal chance of getting heads or tails when flipping a coin, so heads and tails are equally likely outcomes.

equivalent fractions Fractions with different denominators that name the same number. For example, $\frac{1}{2}$ and $\frac{4}{8}$ are equivalent fractions.

fair (coin, die, or spinner) A device that is free from bias. Each side of a fair die or coin will come up about equally often. Each section of a fair spinner will come up in proportion to its area.

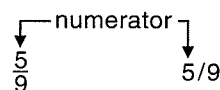


A die has six faces. If the die is fair, each face has the same chance of coming up.

fair game A game in which every player has the same chance of winning.

mixed number A number that is written using both a whole number and a fraction. For example, $2\frac{1}{4}$ is a mixed number equal to $2 + \frac{1}{4}$.

numerator The number above the line in a fraction. In a fraction where the whole (or ONE or unit whole) is divided into a number of equal parts, the numerator represents the number of equal parts being considered. In the fraction $\frac{a}{b}$, a is the numerator.



probability A number from 0 through 1 that tells the chance that an event will happen. The closer a probability is to 1, the more likely the event is to happen.

whole (or ONE or unit whole) The entire object, collection of objects, or quantity being considered; the ONE; the unit whole; 100%.

“whole” box In *Everyday Mathematics*, a box in which students write the name of the whole (or ONE or unit whole).

Whole

24 pennies

Do-Anytime Activities

To work with your child on concepts taught in this unit, try these interesting and rewarding activities:

1. Have your child look for everyday uses of fractions in grocery items, clothing sizes, cookbooks, measuring cups and spoons, and statistics in newspapers and on television.
2. Encourage your child to express numbers, quantities, and measures, such as a quarter of an hour, a quart of orange juice, a dozen eggs, and a pint of milk.
3. While grocery shopping, help your child compare prices by looking at shelf labels or calculating unit prices. Help your child make decisions about the "better buy." If a calculator is available, have your child take it to the store.
4. Have your child look for everyday uses of probabilities in games, sports, and weather reports. Ask your child to make a list of events that could never happen, might happen, and are sure to happen.

Building Skills through Games

In this unit, your child will work on his or her understanding of fractions and probability by playing the following games. For detailed instructions, see the *Student Reference Book*.

Chances Are See *Student Reference Book*, pages 236 and 237.

This game is for 2 players and requires one deck of *Chances Are* Event Cards and one deck of *Chances Are* Probability Cards. The game develops skill in using probability terms to describe the likelihood of events.

Fraction Match See *Student Reference Book*, page 243.

This game is for 2 to 4 players and requires one deck of *Fraction Match* cards. The game develops skill in naming equivalent fractions.

Fraction Of See *Student Reference Book*, pages 244 and 245.

This game is for 2 players and requires one deck of *Fraction Of* Fraction Cards and one deck of *Fraction Of* Set Cards. The game develops skill in finding the fraction of a number.

Fraction Top-It See *Student Reference Book*, page 247.

This is a game for 2 to 4 players and requires one set of 32 Fraction Cards. The game develops skill in comparing fractions.

Getting to One See *Student Reference Book*, page 248.

This is a game for 2 players and requires one calculator. The game develops skill in estimation.

Grab Bag See *Student Reference Book*, page 249.

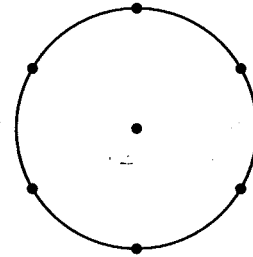
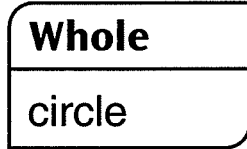
This game is for 2 players or two teams of 2 and requires one deck of *Grab Bag* cards. The game develops skill in calculating the probability of an event.

STUDY LINK
7•1

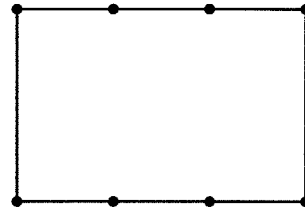
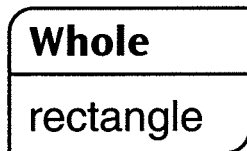
Fractions



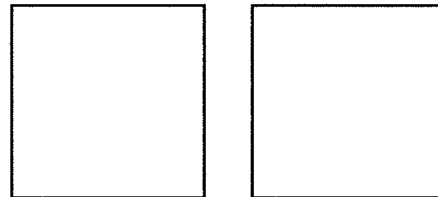
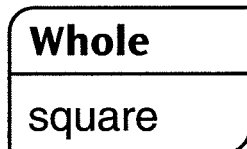
1. Divide the circle into 6 equal parts.
Color $\frac{5}{6}$ of the circle.



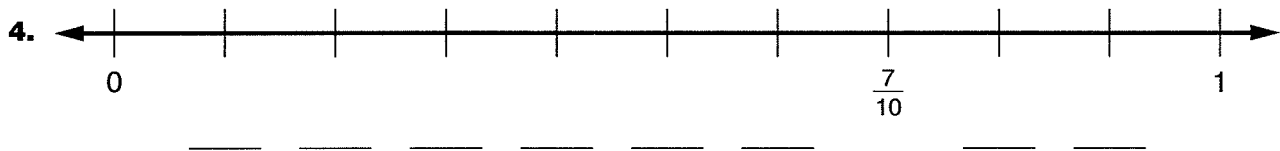
2. Divide the rectangle into 3 equal parts.
Shade $\frac{2}{3}$ of the rectangle.



3. Divide each square into fourths.
Color $1\frac{3}{4}$ of the squares.



Fill in the missing fractions and mixed numbers on the number lines.


Practice

6. $854 + 267 =$ _____

7. _____ $= 3,398 + 2,635$

8. _____ $= 6,374 - 755$

9. $5,947 - 3,972 =$ _____

STUDY LINK
7•2

“Fraction-of” Problems



1. Theresa had 24 cookies. She gave $\frac{1}{6}$ to her sister and $\frac{3}{6}$ to her mother.



| |
|--------------|
| Whole |
| |

- a. Fill in the “whole” box.
- b. How many cookies did she give to her sister? _____ cookies
- c. How many did she give to her mother? _____ cookies
- d. How many did she have left? _____ cookies

Solve.

2. $\frac{1}{3}$ of 18 = _____ 3. $\frac{2}{3}$ of 18 = _____ 4. $\frac{1}{5}$ of 35 = _____
5. $\frac{4}{5}$ of 35 = _____ 6. $\frac{1}{4}$ of 40 = _____ 7. $\frac{3}{4}$ of 40 = _____

Try This

8. $\frac{5}{8}$ of 16 = _____ 9. $\frac{4}{9}$ of 27 = _____ 10. $\frac{3}{5}$ of 20 = _____
11. What is $\frac{1}{4}$ of 10? _____ Explain. _____
- _____
- _____

Practice

12. $92 \div 4 =$ _____ 13. $59 / 3 =$ _____
14. _____ = $104 / 8$ 15. $9 \overline{)376} =$ _____

STUDY LINK
7•3

Color Tiles



There are 5 blue, 2 red, 1 yellow, and 2 green tiles in a bag.

- Without looking, Maren picks a tile from the bag. Which of these best describes her chances of picking a blue tile?
 - likely
 - 50-50 chance
 - unlikely
 - very unlikely
- Which of these best describes her chances of picking a yellow tile?
 - certain
 - likely
 - 50-50 chance
 - very unlikely
- Find the probability of each event. Then make up an event and find the probability.

| Event | Favorable Outcomes | Possible Outcomes | Probability |
|---------------------------------|--------------------|-------------------|----------------------|
| Pick a blue tile | 5 | 10 | $\frac{5}{10}$ |
| Pick a red tile | | 10 | $\frac{\square}{10}$ |
| Pick a yellow tile | | 10 | $\frac{\square}{10}$ |
| Pick a green tile | | 10 | $\frac{\square}{10}$ |
| Pick a blue, red, or green tile | | 10 | $\frac{\square}{10}$ |
| | | 10 | $\frac{\square}{10}$ |

- Suppose you picked a color tile from the bag 10 times. After each pick, you put the tile back in the bag. How many times would you expect to pick a blue tile? _____ times
Try the experiment. Compare your prediction with the actual results.

Practice

- $74 * 8 =$ _____
- _____ = $4 * 987$
- _____ = $65 * 26$
- $35 * 462 =$ _____

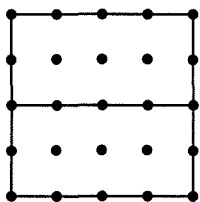
STUDY LINK
7•4

Dividing Squares

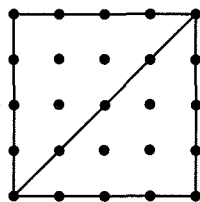


Use a straightedge and the dots below to help you divide each of the squares into equal parts.

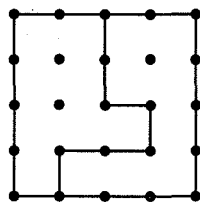
Example: Squares A, B, C, and D are each divided in half in a different way.



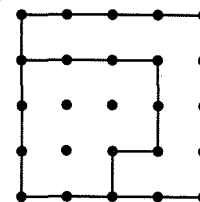
A



B

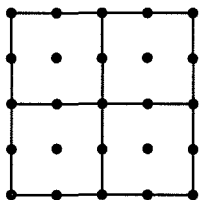


C

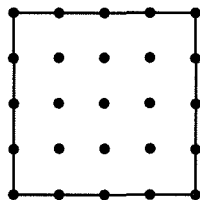


D

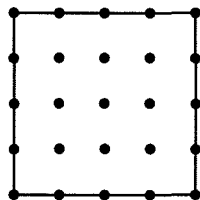
1. Square E is divided into fourths. Divide squares F, G, and H into fourths, each in a different way.



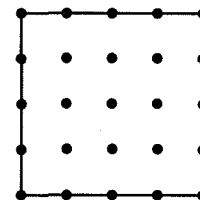
E



F

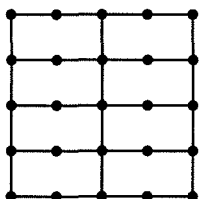


G

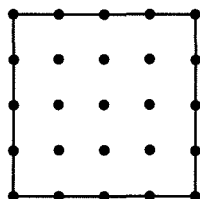


H

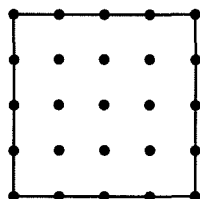
2. Square I is divided into eighths. Divide squares J, K, and L into eighths, each in a different way.



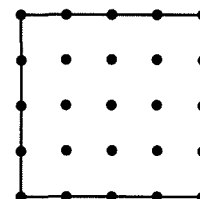
I



J



K



L

3. Rosa has 15 quarters and 10 nickels. She buys juice from a store for herself and her friends. The juice costs 35 cents per can. She gives the cashier $\frac{2}{3}$ of the quarters and $\frac{3}{5}$ of the nickels. The cashier does not give her any change.

How many cans of juice did she buy? _____ cans

Show your work on the back of this paper.

Practice

4. $0.636 + 0.245 =$ _____

5. _____ $= 9.085 + 0.76$

6. _____ $= 1.73 - 0.14$

7. $0.325 - 0.297 =$ _____

STUDY LINK
7•5

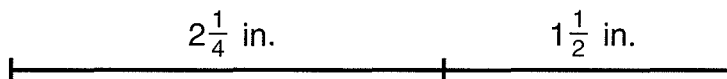
Fractions



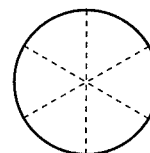
1. Jake has $\frac{3}{4}$ of a dollar. Maxwell has $\frac{1}{10}$ of a dollar.
Do they have more or less than \$1.00 in all? _____

Number model: _____

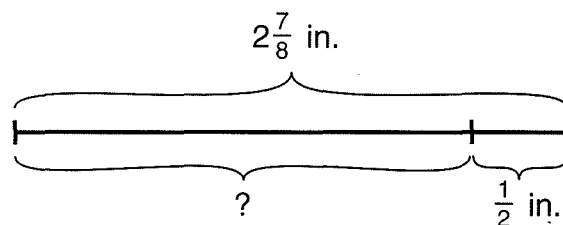
2. Jillian draws a line segment $2\frac{1}{4}$ inches long. Then she makes the line segment $1\frac{1}{2}$ inches longer. How long is the line segment now? _____ inches



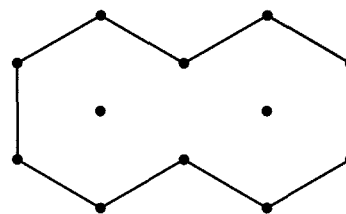
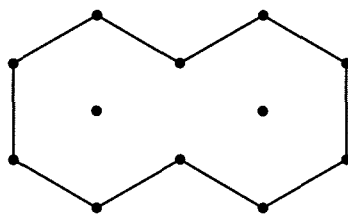
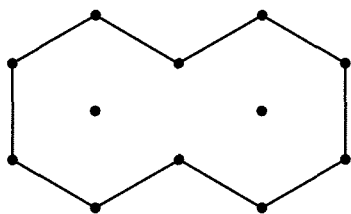
3. A pizza was cut into 6 slices. Benjamin ate $\frac{1}{3}$ of the pizza and Dana ate $\frac{1}{2}$. What fraction of the pizza was left? _____



4. Rafael drew a line segment $2\frac{7}{8}$ inches long. Then he erased $\frac{1}{2}$ inch. How long is the line segment now? _____ inches



5. Two hexagons together are one whole. Draw line segments to divide each whole into trapezoids, rhombuses, and triangles. Write a number model to show how the parts add up to the whole.



Practice

6. $\frac{1}{4}$ of 32 = _____ 7. _____ = $\frac{9}{10}$ of 50 8. $\frac{7}{8}$ of 56 = _____ 9. _____ = $\frac{11}{12}$ of 24

STUDY LINK
7•6

Many Names for Fractions



Write the letters of the pictures that represent each fraction.

1. $\frac{1}{2}$ C, _____

2. $\frac{3}{4}$ _____

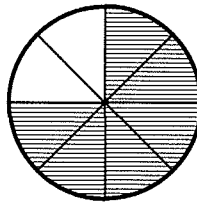
3. $\frac{4}{5}$ _____

4. $\frac{2}{3}$ _____

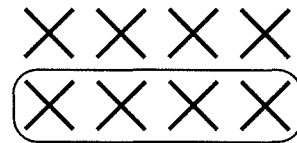
A



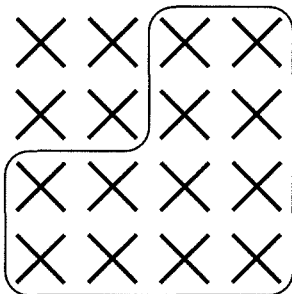
B



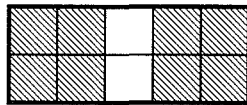
C



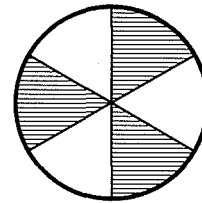
D



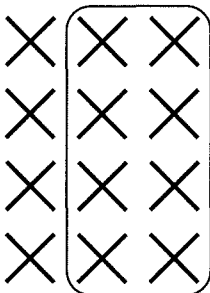
E



F



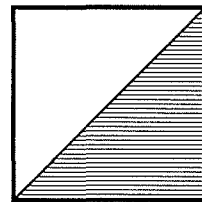
G



H



I



Practice

5. _____ = $\frac{1}{6} + \frac{3}{6}$

6. $\frac{2}{4} + \frac{1}{4} =$ _____

7. $\frac{1}{2} + \frac{2}{6} =$ _____

8. $\frac{5}{6} - \frac{2}{6} =$ _____

9. $\frac{3}{4} - \frac{1}{4} =$ _____

10. $\frac{1}{3} - \frac{1}{6} =$ _____

STUDY LINK
7•7

Fraction Name-Collection Boxes



In each name-collection box:

Write the missing number in each fraction so that the fraction belongs in the box. Write one more fraction that can go in the box.

1.

| |
|----------------------|
| $\frac{1}{2}$ |
| $\frac{\square}{4}$ |
| $\frac{5}{\square}$ |
| $\frac{10}{\square}$ |
| $\frac{\square}{18}$ |
| |

2.

| |
|----------------------|
| $\frac{2}{3}$ |
| $\frac{\square}{9}$ |
| $\frac{12}{\square}$ |
| $\frac{20}{\square}$ |
| $\frac{\square}{12}$ |
| |

3.

| |
|-----------------------|
| $\frac{1}{4}$ |
| $\frac{\square}{12}$ |
| $\frac{5}{\square}$ |
| $\frac{10}{\square}$ |
| $\frac{\square}{100}$ |
| |

- 4.** Make up your own name-collection box problems like the ones above. Ask a friend to solve your problems. Check your friend's work.

a.

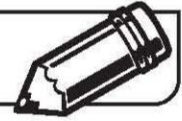
| |
|--|
| |
| |
| |

b.

| |
|--|
| |
| |
| |

Practice

5. _____ = $95 / 4$ **6.** $57 \div 3 =$ _____ **7.** _____ = $882 / 21$

LESSON
7•8**Designing a Baseball Cap Rack**

Karen plans to design and construct two identical horizontal racks to display her baseball cap collection. She has 12 different caps to hang on pegs. Karen's sister suggested that she add extra pegs for caps she may get in the future. Karen measured the width of some caps and decided that the pegs need to be 2 decimeters ($\frac{2}{10}$ meter) apart. Also, in order to fit on her wall, each rack cannot be more than 160 centimeters long.

Help Karen design one of the identical racks. Use metric units. Fill in the blanks below as you create the design.

1. Each of Karen's racks will have _____ pegs for hats.
2. The total length of the rack will be _____ centimeters.
3. The first peg will be _____ centimeters from the edge of the rack.
4. In the space below, draw a rough sketch of the rack. Include the measurements in your sketch.

5. Write a fraction addition number sentence to show the total length of the rack.

6. Could there be 9 pegs on the rack? Explain your answer.

LESSON
7•8
Designing a Baseball Cap Rack *continued*


Use your answers to Problems 1 and 2 on *Math Masters*, page 227A to fill in the blanks in the sentence below.

Each rack is _____ centimeters long and has _____ pegs.

At the lumberyard, Karen discovered she could spend less if she was willing to glue leftover pieces of wood together instead of using one long piece. She measured several boards and wrote down the lengths:

$$\frac{7}{10} \text{ meter}$$

$$\frac{85}{100} \text{ meter}$$

$$\frac{35}{100} \text{ meter}$$

$$\frac{3}{10} \text{ meter}$$

$$\frac{20}{100} \text{ meter}$$

$$\frac{9}{10} \text{ meter}$$

$$\frac{8}{10} \text{ meter}$$

$$\frac{55}{100} \text{ meter}$$

$$\frac{75}{100} \text{ meter}$$

$$\frac{15}{100} \text{ meter}$$

- 7.** Can Karen use these pieces to create two racks of the length you planned? Explain why or why not. Show your work.

Pegs come in two different packages:

5-pack for \$3.79 or 2-pack for \$1.99

- 8.** Explain how Karen can purchase the pegs for her racks, spending as little money as possible.

STUDY LINK
7•8

Fractions and Decimals



Write 3 equivalent fractions for each decimal.

Example:

$$0.8 \quad \frac{8}{10} \quad \frac{4}{5} \quad \frac{80}{100}$$

1. 0.20 _____ _____ _____

2. 0.6 _____ _____ _____

3. 0.50 _____ _____ _____

4. 0.75 _____ _____ _____

Write an equivalent decimal for each fraction.

5. $\frac{3}{10}$ _____

6. $\frac{63}{100}$ _____

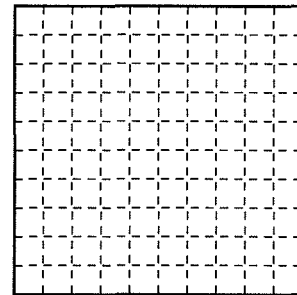
7. $\frac{7}{10}$ _____

8. $\frac{2}{5}$ _____

9. Shade more than $\frac{53}{100}$ of the square and less than $\frac{8}{10}$ of the square. Write the value of the shaded part as a decimal and a fraction.

Decimal: _____

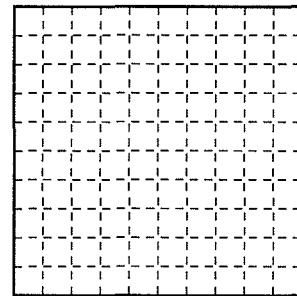
Fraction: _____



10. Shade more than $\frac{11}{100}$ of the square and less than $\frac{1}{4}$ of the square. Write the value of the shaded part as a decimal and a fraction.

Decimal: _____

Fraction: _____


Practice

11. _____ = $78 * 9$ 12. $461 * 7 =$ _____ 13. _____ = $39 * 25$

STUDY LINK
7•9

Compare and Order Fractions



Write $<$, $>$, or $=$ to make each number sentence true.

1. $\frac{5}{6}$ _____ $\frac{1}{6}$

2. $\frac{3}{10}$ _____ $\frac{3}{4}$

3. $\frac{2}{3}$ _____ $\frac{10}{15}$

4. $\frac{10}{40}$ _____ $\frac{4}{16}$

5. $\frac{4}{9}$ _____ $\frac{7}{9}$

6. $\frac{5}{6}$ _____ $\frac{5}{8}$

7. Explain how you solved Problem 1. _____

8. Explain how you solved Problem 2. _____

9. Circle each fraction that is less than $\frac{1}{2}$.

$\frac{7}{8}$ $\frac{1}{4}$ $\frac{4}{10}$ $\frac{7}{12}$ $\frac{5}{9}$ $\frac{3}{7}$ $\frac{24}{50}$ $\frac{67}{100}$

Write the fractions in order from smallest to largest.

10. $\frac{3}{12}$, $\frac{7}{12}$, $\frac{1}{12}$, $\frac{11}{12}$, $\frac{8}{12}$ **smallest** _____ _____ _____ **largest**

11. $\frac{1}{5}$, $\frac{1}{3}$, $\frac{1}{20}$, $\frac{1}{2}$, $\frac{1}{50}$ **smallest** _____ _____ _____ **largest**

12. $\frac{4}{5}$, $\frac{4}{100}$, $\frac{4}{4}$, $\frac{4}{8}$, $\frac{4}{12}$ **smallest** _____ _____ _____ **largest**

Practice

13. $\frac{1}{6}$ of 30 = _____

14. $\frac{3}{4}$ of _____ = 75

15. $\frac{4}{5}$ of 45 = _____


STUDY LINK
7•10

What Is the ONE?



For Problems 1 and 2, use your Geometry Template or sketch the shapes.



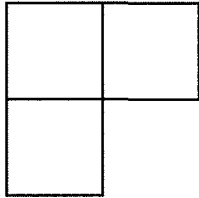
1. Suppose  is $\frac{1}{4}$. Draw each of the following:

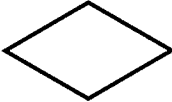
Example: $\frac{3}{4}$

a. 1

b. $1\frac{1}{2}$

c. 2



2. Suppose  is $\frac{2}{3}$. Draw each of the following:

a. $\frac{1}{3}$

b. 1

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

d. 2

Use counters to solve the following problems.

3. If 14 counters are $\frac{1}{2}$, then what is the ONE?

_____ counters

4. If 9 counters are $\frac{1}{3}$, then what is the ONE?

_____ counters

5. If 12 counters are $\frac{2}{5}$, then what is the ONE? _____ counters

6. If 16 counters are $\frac{4}{9}$, then what is the ONE? _____ counters

Practice

7. _____ = $\frac{1}{4} + \frac{1}{2}$

8. $\frac{1}{3} + \frac{1}{6} =$ _____

9. $\frac{3}{4} - \frac{1}{4} =$ _____

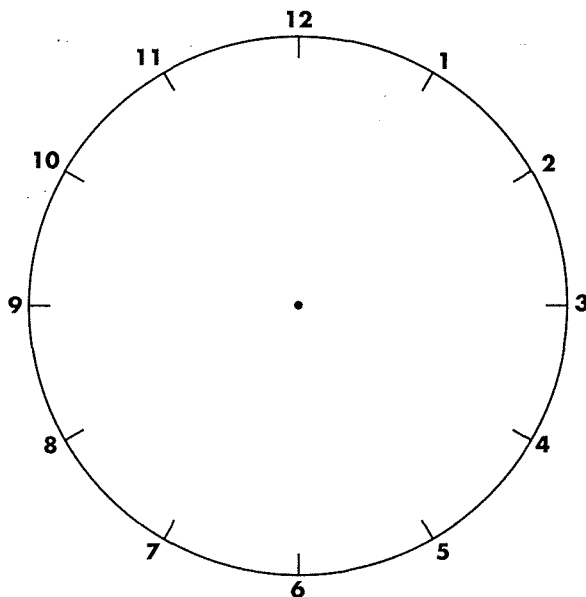
10. _____ = $\frac{5}{6} - \frac{1}{3}$

STUDY LINK
7•11

Spinners and Fractions



1. Design your own spinner with as many colors as you wish. Use a pencil until you are satisfied with your work, then color your spinner.



2. Describe your spinner.

- a. The chances of the paper clip landing on _____ are _____ out of _____.
(color)
- b. The paper clip has a _____ chance of landing on _____.
(color)
- c. It is unlikely that the paper clip will land on _____.
(color)
- d. It is _____ times as likely to land on _____ as on _____.
(color) (color)
- e. It is more likely to land on _____ than _____.
(color) (color)

Practice

3. _____ = $87 \div 3$

4. $6 \overline{)99} =$ _____

5. $945 \div 9 =$ _____

6. $706 \div 5 =$ _____

STUDY LINK
7•11

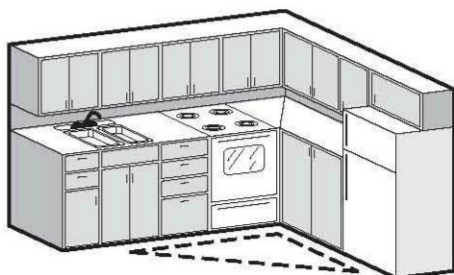
Layout of a Kitchen



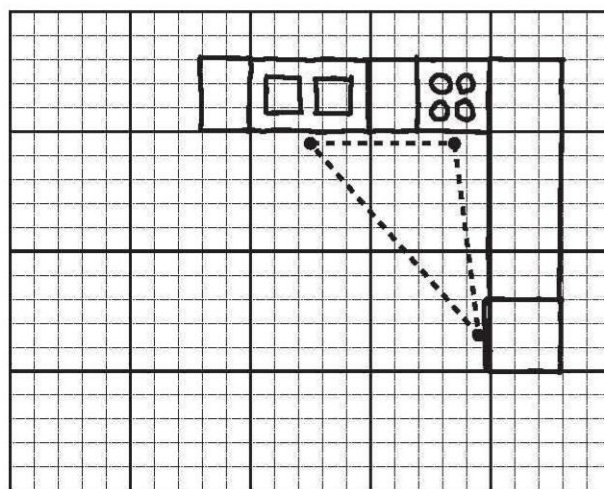
Pages 235 and 236 will be needed to do Lesson 8-1 in the next unit.
 Please complete the pages and return them to class.

Every kitchen needs a stove, a sink, and a refrigerator. Notice how the stove, sink, and refrigerator are arranged in the kitchen below. The triangle shows the work path in the kitchen. Walking from the stove to the sink and to the refrigerator forms an invisible “triangle” on the floor.

Front View of Kitchen



Bird's-Eye View of Kitchen
 (looking down at appliances
 and countertops)



The side of a grid square represents 1 foot.

- Put one coin or other marker on the floor in front of your sink, one in front of your stove, and one in front of your refrigerator.
- Measure the distance between each pair of markers. Use feet and inches, and record your measurements below.

Distance between

a. stove and refrigerator About _____ feet _____ inches

b. refrigerator and sink About _____ feet _____ inches

c. sink and stove About _____ feet _____ inches

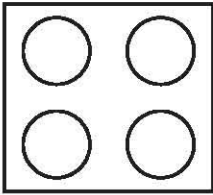
STUDY LINK
7•11**Layout of a Kitchen** *continued*

3. On the grid below, make a sketch that shows how the stove, sink, and refrigerator are arranged in your kitchen.

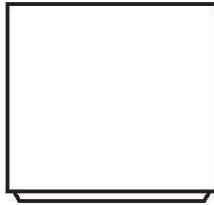
Your sketch should show a bird's-eye view of these 3 appliances (including all countertops).

If your oven is separate from your stove, sketch the stove top only.

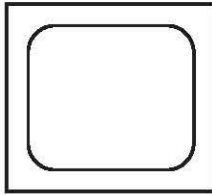
Use the following symbols in your sketch:



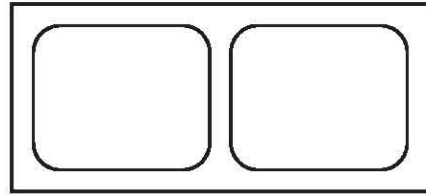
stove



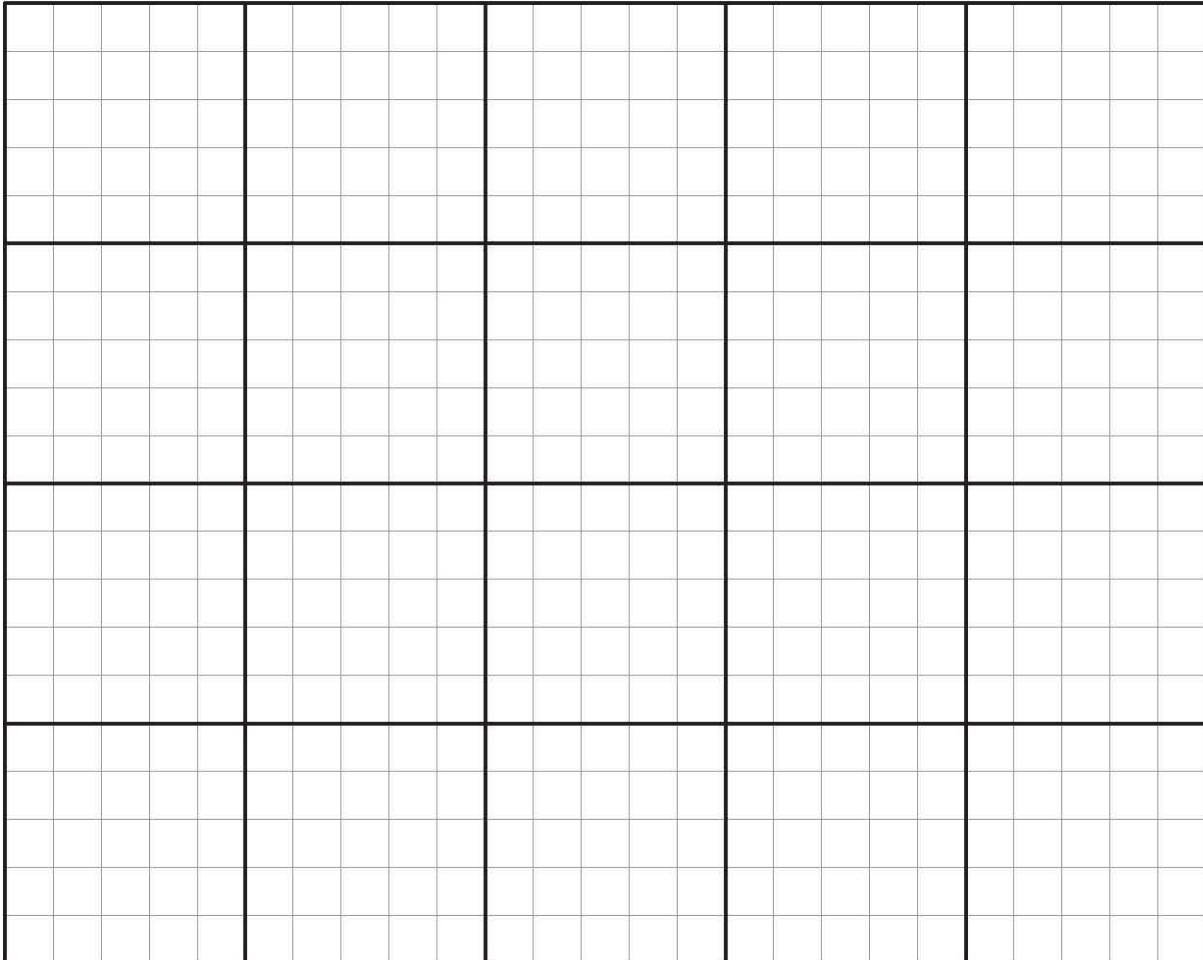
refrigerator



sink



double sink



STUDY LINK
7•12

What Are the Chances?



1. You are going to toss 2 pennies 20 times. How many times do you expect the 2 pennies will come up as

- a. 2 heads? _____ times b. 2 tails? _____ times
- c. 1 head and 1 tail? _____ times

2. Now toss 2 pennies together 20 times. Record the results in the table.

| A Penny Toss | |
|-------------------|-----------------|
| Results | Number of Times |
| 2 heads | |
| 2 tails | |
| 1 head and 1 tail | |

3. What fraction of the tosses came up as

- a. 2 heads? _____ b. 2 tails? _____ c. 1 head and 1 tail? _____

4. Suppose you were to flip the coins 1,000 times. What fraction do you expect would come up as

- a. 2 heads? _____ b. 2 tails? _____
- c. 1 head and 1 tail? _____

5. Explain how you got your answers for Problem 4.

Practice

6. $7 * 48 =$ _____

7. $874 * 9 =$ _____

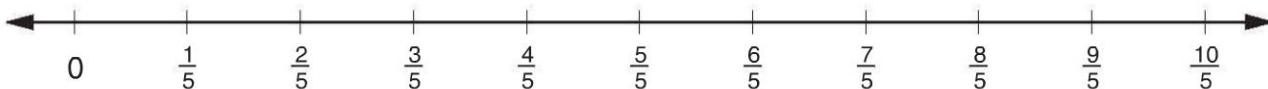
8. _____ = $45 * 86$

9. _____ = $34 * 142$

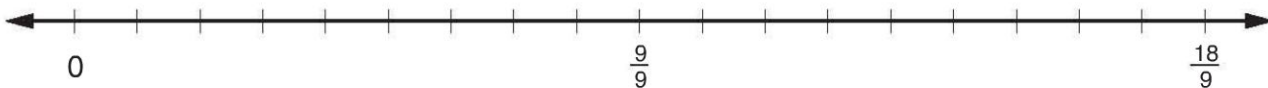
LESSON
7•12a
Multiplying Fractions by Whole Numbers


Use the number lines to help you solve the problems.

1. $5 * \frac{1}{5} =$ _____



2. $3 * \frac{4}{9} =$ _____



3. $6 * \frac{3}{6} =$ _____



Write a multiplication equation to represent the problem and then solve.

4. Rahsaan needs to make 5 batches of granola bars. A batch calls for $\frac{1}{2}$ cup of honey.

How much honey does he need? Equation: _____

5. Joe swims $\frac{6}{10}$ of a mile 5 days a week. How far does he swim every week?

Equation: _____

How far would he swim if he swam every day of the week?

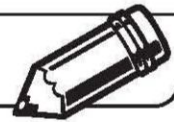
Equation: _____

Practice

6. **a.** List the factor pairs of 5. _____ **b.** Is 5 a prime number? _____

7. **a.** List the factor pairs of 21. _____

- b.** Is 21 a prime number? _____

LESSON
7·12a**Skip Counting by a Unit Fraction**

1. Use your calculator to count by $\frac{1}{2}$ s. Complete the table below.

| One $\frac{1}{2}$ | Two $\frac{1}{2}$ s | Three $\frac{1}{2}$ s | Four $\frac{1}{2}$ s | Five $\frac{1}{2}$ s | Six $\frac{1}{2}$ s | Seven $\frac{1}{2}$ s | Eight $\frac{1}{2}$ s | Nine $\frac{1}{2}$ s | Ten $\frac{1}{2}$ s |
|----------------------|------------------------|--------------------------|-------------------------|-------------------------|------------------------|--------------------------|--------------------------|-------------------------|------------------------|
| $\frac{1}{2}$ | $\frac{2}{2}$ | $\frac{3}{2}$ | $\frac{4}{2}$ | | | | | | |

2. Use your calculator to count by $\frac{1}{3}$ s. Complete the table below.

| One $\frac{1}{3}$ | Two $\frac{1}{3}$ s | Three $\frac{1}{3}$ s | Four $\frac{1}{3}$ s | Five $\frac{1}{3}$ s | Six $\frac{1}{3}$ s | Seven $\frac{1}{3}$ s | Eight $\frac{1}{3}$ s | Nine $\frac{1}{3}$ s | Ten $\frac{1}{3}$ s |
|----------------------|------------------------|--------------------------|-------------------------|-------------------------|------------------------|--------------------------|--------------------------|-------------------------|------------------------|
| $\frac{1}{3}$ | $\frac{2}{3}$ | $\frac{3}{3}$ | $\frac{4}{3}$ | | | | | | |

3. Use your calculator to count by $\frac{1}{5}$ s. Complete the table below.

| One $\frac{1}{5}$ | Two $\frac{1}{5}$ s | Three $\frac{1}{5}$ s | Four $\frac{1}{5}$ s | Five $\frac{1}{5}$ s | Six $\frac{1}{5}$ s | Seven $\frac{1}{5}$ s | Eight $\frac{1}{5}$ s | Nine $\frac{1}{5}$ s | Ten $\frac{1}{5}$ s |
|----------------------|------------------------|--------------------------|-------------------------|-------------------------|------------------------|--------------------------|--------------------------|-------------------------|------------------------|
| $\frac{1}{5}$ | $\frac{2}{5}$ | | | | | | | | |

4. Use your calculator to count by $\frac{1}{8}$ s. Complete the table below.

| One $\frac{1}{8}$ | Two $\frac{1}{8}$ s | Three $\frac{1}{8}$ s | Four $\frac{1}{8}$ s | Five $\frac{1}{8}$ s | Six $\frac{1}{8}$ s | Seven $\frac{1}{8}$ s | Eight $\frac{1}{8}$ s | Nine $\frac{1}{8}$ s | Ten $\frac{1}{8}$ s |
|----------------------|------------------------|--------------------------|-------------------------|-------------------------|------------------------|--------------------------|--------------------------|-------------------------|------------------------|
| $\frac{1}{8}$ | | | | | | | | | |

5. Use your calculator to count by $\frac{1}{10}$ s. Complete the table below.

| One $\frac{1}{10}$ | Two $\frac{1}{10}$ s | Three $\frac{1}{10}$ s | Four $\frac{1}{10}$ s | Five $\frac{1}{10}$ s | Six $\frac{1}{10}$ s | Seven $\frac{1}{10}$ s | Eight $\frac{1}{10}$ s | Nine $\frac{1}{10}$ s | Ten $\frac{1}{10}$ s |
|-----------------------|-------------------------|---------------------------|--------------------------|--------------------------|-------------------------|---------------------------|---------------------------|--------------------------|-------------------------|
| | | | | | | | | | |

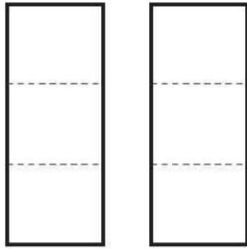
6. How is skip counting by $\frac{1}{3}$ s on your calculator from 0 to nine $\frac{1}{3}$ s the same as finding the product $9 * \frac{1}{3}$?

LESSON
7•12a**Addition Model for Multiplying**

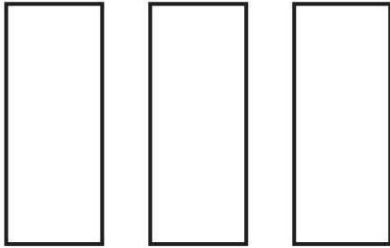
Draw models for each product. Then add the fractions to find the product.



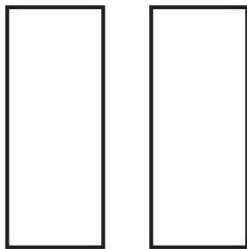
1. $2 * \frac{1}{3} =$ _____



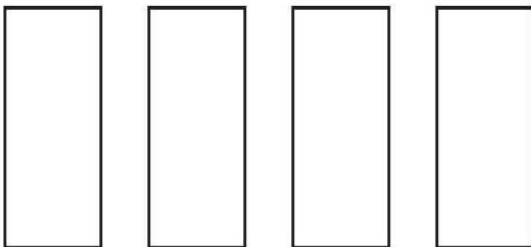
2. $3 * \frac{1}{2} =$ _____

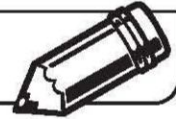


3. $2 * \frac{2}{5} =$ _____



4. $4 * \frac{2}{3} =$ _____



LESSON
7•12a**Area Model for Multiplying**

For each problem, divide the model into strips, and then shade a fraction of the area to find the product.



1. $\frac{1}{3}$ of 2 square units = _____ square unit(s)

So, $\frac{1}{3} * 2 =$ _____.



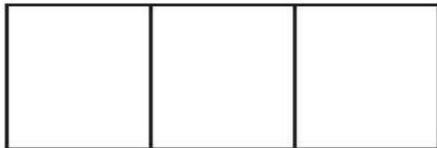
2. $\frac{1}{4}$ of 4 square units = _____ square unit(s)

So, $\frac{1}{4} * 4 =$ _____.



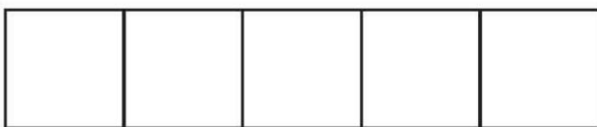
3. $\frac{2}{3}$ of 3 square units = _____ square unit(s)

So, $\frac{2}{3} * 3 =$ _____.



4. $\frac{3}{4}$ of 5 square units = _____ square unit(s)

So, $\frac{3}{4} * 5 =$ _____.



LESSON
7•13**Self Assessment**Progress
Check 7

Think about each skill listed below. Assess your own progress by checking the most appropriate box.

| Skills | I can do this on my own and explain how to do it. | I can do this on my own. | I can do this if I get help or look at an example. |
|--|---|--------------------------|--|
| 1. Solve “fraction-of” problems like these: $\frac{1}{4}$ of 8 $\frac{4}{5}$ of 30 | | | |
| 2. Find equivalent fractions. | | | |
| 3. Compare fractions like these: $\frac{1}{4}$ and $\frac{1}{10}$ $\frac{2}{5}$ and $\frac{2}{9}$ | | | |
| 4. Divide multidigit numbers like these: 492 / 7 684 / 5 | | | |
| 5. Add fractions like these: $\frac{1}{6} + \frac{2}{6}$ $\frac{1}{3} + \frac{1}{6}$ $\frac{1}{2} + \frac{1}{3}$ | | | |
| 6. Use a fraction to describe the probability of an event. | | | |


STUDY LINK
7·13

Unit 8: Family Letter

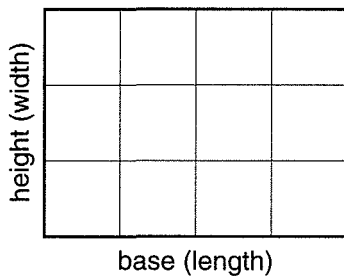
Perimeter and Area

In previous grades, your child studied the *perimeter* (distance around) and the *area* (amount of surface) of various geometric figures. This next unit will extend your child's understanding of geometry by developing and applying formulas for the areas of figures such as rectangles, parallelograms, and triangles.

Area of a Rectangle

Area = base * height (or length * width)

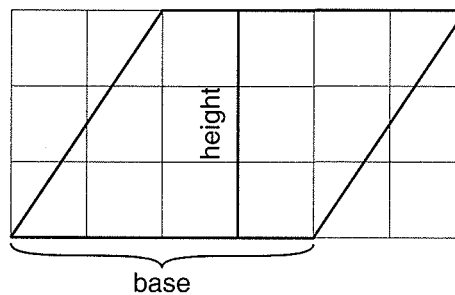
$$A = b * h \text{ (or } l * w \text{)}$$



Area of a Parallelogram

Area = base * height

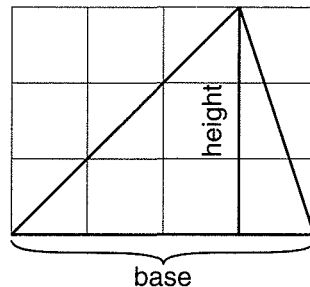
$$A = b * h$$



Area of a Triangle

Area = $\frac{1}{2}$ of (base * height)

$$A = \frac{1}{2} * b * h$$



Students will learn how to make scale drawings and apply their knowledge of perimeter, area, and scale drawing by analyzing the arrangement of the appliances in their kitchens and the furniture in their bedrooms.

Students will also calculate the area of the skin that covers their entire body. A rule of thumb is that the area of a person's skin is about 100 times the area of one side of that person's hand. Ask your child to show you how to calculate the area of your own skin.

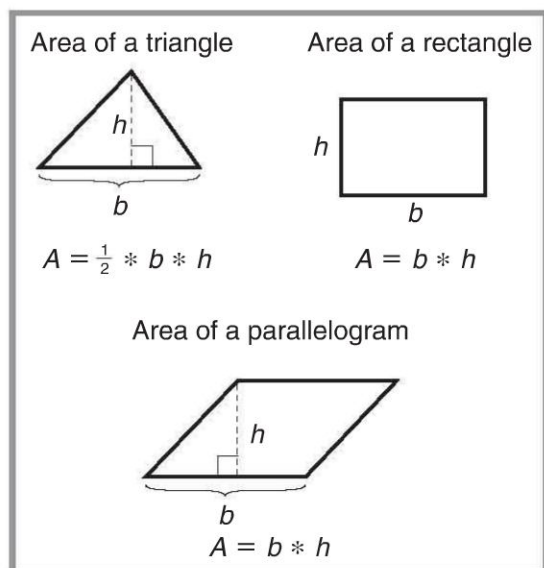
The World Tour will continue. Students will examine how geographical areas are measured and the difficulties in making accurate measurements. They will compare areas for South American countries by using division to calculate the ratio of areas.

Please keep this Family Letter for reference as your child works through Unit 8.

Vocabulary

Important terms in Unit 8:

area The amount of surface inside a closed 2-dimensional (flat) boundary. Area is measured in *square units*, such as square inches or square centimeters.

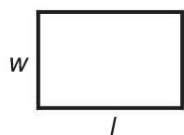


formula A general rule for finding the value of something. A formula is often written using letter *variables*, which stand for the quantities involved.

length The distance between two points on a 1-dimensional figure. Length is measured in units such as inches, meters, and miles.

perimeter The distance around a 2-dimensional shape along the boundary of the shape. The perimeter of a circle is called its circumference. The perimeter of a polygon is the sum of the lengths of its sides.

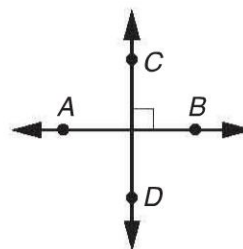
Perimeter of a rectangle



$$P = l + w + l + w$$

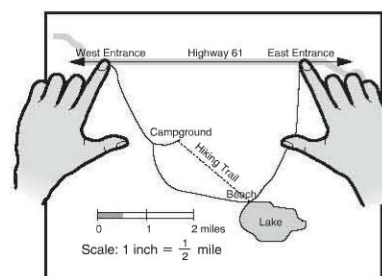
$$= 2 * (l + w)$$

perpendicular Crossing or meeting at right angles. Lines, rays, line segments, and planes that cross or meet at right angles are perpendicular. The symbol \perp means "is perpendicular to," as in "line $CD \perp$ line AB ." The symbol \square indicates a right angle.



Perpendicular lines

scale The ratio of the distance on a map, globe, drawing, or model to an actual distance.



scale drawing A drawing of an object or a region in which all parts are drawn to the same scale as the object. Architects and builders often use scale drawings.

square unit A unit used to measure area.

For example, a square that measures one inch on each side has an area of one square inch.

variable A letter or other symbol that represents a number. A variable can represent one specific number, or it can stand for many different numbers.

width The length of one side of a rectangle or rectangular object, typically the shorter side.

Do-Anytime Activities

To work with your child on concepts taught in this unit, try these interesting and engaging activities:

1. Have your child pretend that he or she is a carpenter whose job is to redesign a room—for example, a bedroom, the kitchen, or the living room. Have him or her make a rough estimate of the area of the room. Then help your child check the estimate by finding the actual area using a tape measure or, if possible, blueprints.
2. Have your child pretend that he or she is an architect. Give him or her some dimensions and space requirements to work with. Then have your child design a “dream house,” “dream bedroom,” or sports stadium, and make a scale drawing for that design.
3. Work with your child to make a scale drawing of your neighborhood. Or have your child make a scale drawing of the floor plan of your house or apartment.
4. Have your child compare the areas of continents, countries, states, or major cities.

Building Skills through Games

In this unit, your child will calculate perimeter and area, compare fractions, identify equivalent fractions, find fractions of collections, and calculate expected probabilities by playing the following games. For detailed instructions, see the *Student Reference Book*.

Fraction Match See *Student Reference Book*, page 243.

This is a game for 2 to 4 players and requires a deck of *Fraction Match Cards*. The game provides practice recognizing equivalent fractions.

Fraction Of See *Student Reference Book*, pages 244 and 245.

This is a game for 2 players and requires 1 deck of *Fraction Of Fraction Cards*, 1 deck of *Fraction Of Set Cards*, and 1 *Fraction Of Gameboard and Record Sheet*. The game provides practice finding fractions of collections.

Fraction Top-It See *Student Reference Book*, page 247.

This is a game for 2 to 4 players and requires a set of *Fraction Cards 1 and 2*. The game provides practice comparing fractions.

Grab Bag See *Student Reference Book*, page 249.

This is a game for 2 players or two teams of 2 players. It requires 1 deck of *Grab Bag Cards*, 2 *Grab Bag Record Sheets*, and 3 six-sided dice. The game provides practice with variable substitution and calculating probabilities of events.

Rugs and Fences See *Student Reference Book*, pages 260 and 261.

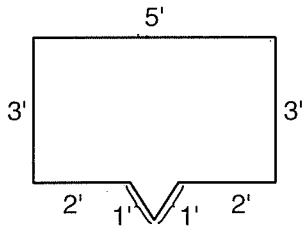
This is a game for 2 players and requires a *Rugs and Fences Polygon Deck* and an *Area and Perimeter Deck*. The game provides practice finding and comparing the area and perimeter of polygons.

STUDY LINK
8•1

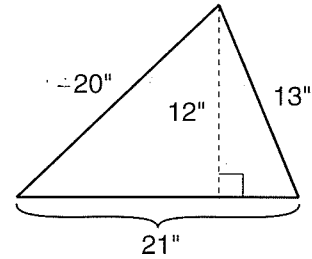
Perimeter



1. Perimeter = _____ feet



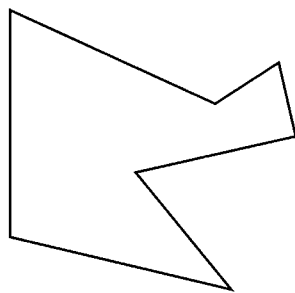
2. Perimeter = _____ inches



3. Draw a rectangle *BLUE* whose perimeter is 16 centimeters. Label the length of the sides.

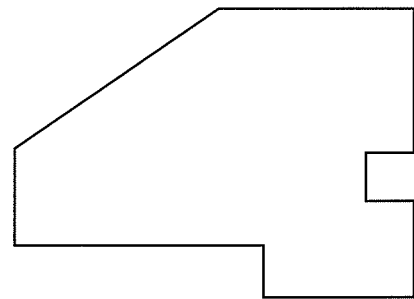
4. Draw a different rectangle *FARM* whose perimeter is also 16 centimeters. Label the length of its sides.

5. Measure the sides of the figure to the nearest centimeter. Label the length of its sides. Find its perimeter.



Perimeter = _____ centimeters

6. Measure the sides of the figure to the nearest $\frac{1}{4}$ inch. Label the length of its sides. Find its perimeter.



Perimeter = _____ inches

Practice

7. $\frac{1}{4}$ of 24 = _____

8. _____ = $\frac{2}{3}$ of 24

9. _____ = $\frac{5}{8}$ of 40

STUDY LINK
8•2

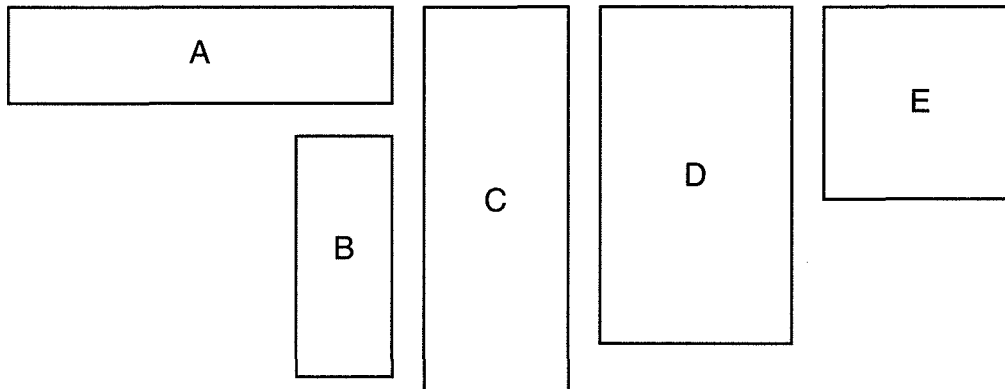
Scale



- If 1 inch on a map represents 13 miles, then
 - 4 inches represent _____ miles.
 - 9 inches represent _____ miles.
 - $2\frac{1}{2}$ inches represent _____ miles.
 - $13\frac{1}{2}$ inches represent _____ miles.
- The scale for a drawing is 1 centimeter:5 meters. Make a scale drawing of a rectangle that measures 20 meters by 15 meters.

Try This

- Scale: $\frac{1}{4}$ inch represents 6 feet. Measure the height of each rectangle to the nearest $\frac{1}{4}$ inch. Complete the table.



| Rectangle | Height in Drawing | Actual Height |
|-----------|-------------------|---------------|
| A | | |
| B | | |
| C | | |
| D | | |
| E | | |

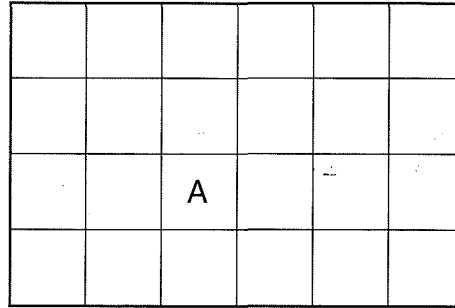
STUDY LINK
8•3

Exploring Area



1. Rectangle A at the right is drawn on a 1-centimeter grid. Find its area.

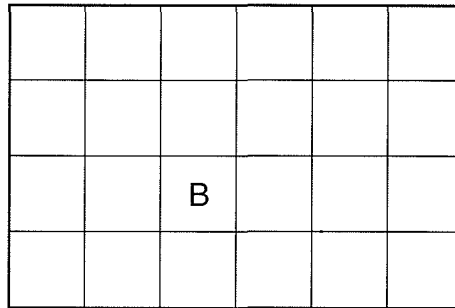
Area = _____ cm^2



2. Rectangle B has the same area as Rectangle A. Cut out Rectangle B. Then cut it into 5 pieces any way you want.

Rearrange the pieces into a new shape that is not a rectangle. Then tape the pieces together in the space below. What is the area of the new shape?

Area of new shape = _____ cm^2


Practice

3. $1,778 + 294 =$ _____ 4. _____ $= 6,096 + 5,644$
 5. $4,007 - 414 =$ _____ 6. _____ $= 8,030 - 5,182$

STUDY LINK
8•4

Areas of Irregular Figures



1. Below is a map of São Paulo State in Brazil. Each grid square represents 2,500 square miles. Estimate the area of São Paulo State.

I counted about _____ grid squares.

The area is about _____ square miles.



2. To the right is a map of Rio de Janeiro State in Brazil. Each grid square represents 2,500 square miles. Estimate the area of Rio de Janeiro State.

I counted about _____ grid squares.

The area is about _____ square miles.


Practice

3. _____ = $73.04 + 15.67$

4. $86.05 - 27.97 =$ _____

5. _____ = $312.11 + 74.064$

6. $57.1 - 39.002 =$ _____

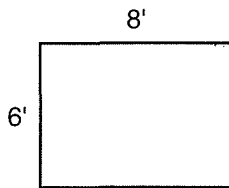
STUDY LINK
8•5

Areas of Rectangles



Find the area of each rectangle.

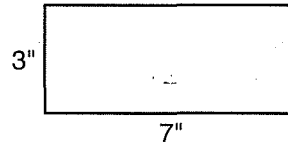
1.



Number model: _____

Area = _____ square feet

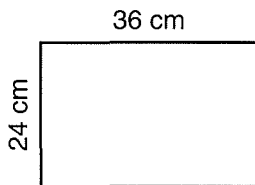
2.



Number model: _____

Area = _____ square inches

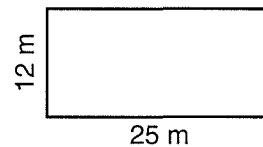
3.



Number model: _____

Area = _____ square centimeters

4.



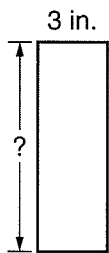
Number model: _____

Area = _____ square meters

Try This

The area of each rectangle is given. Find the missing length.

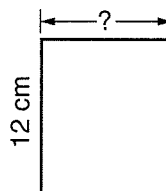
5.



Area = 27 in^2

height = _____ in.

6.



Area = 120 cm^2

base = _____ cm

Practice

7. 3, 6, _____, 12, _____, _____, _____

8. 14, 21, _____, _____, 42, _____, _____

9. 30, _____, 42, 48, _____, _____, _____

10. 12, _____, 36, _____, 60, _____, _____

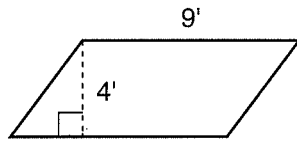
STUDY LINK
8•6

Areas of Parallelograms



Find the area of each parallelogram.

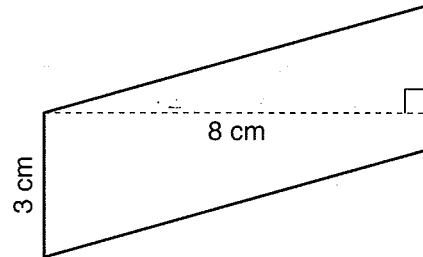
1.



Number model: _____

Area = _____ square feet

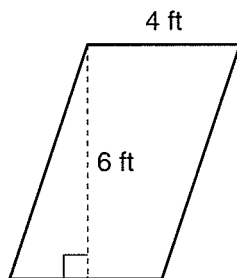
2.



Number model: _____

Area = _____ square centimeters

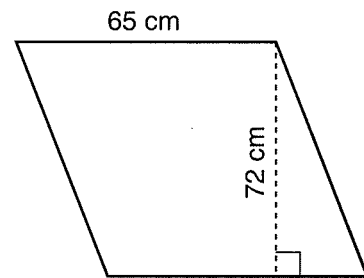
3.



Number model: _____

Area = _____ square feet

4.



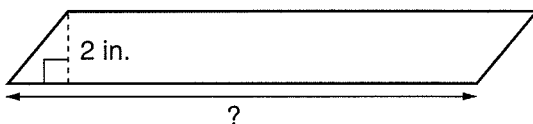
Number model: _____

Area = _____ square centimeters

Try This

The area of each parallelogram is given. Find the length of the base.

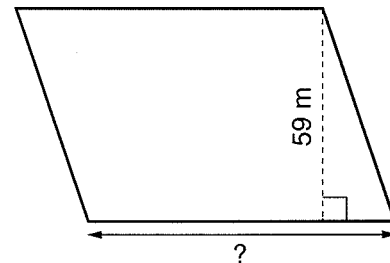
5.



Area = 26 square inches

base = _____ inches

6.



Area = 5,015 square meters

base = _____ meters

STUDY LINK
8•6**Percents in My World**

Percent means “per hundred” or “out of a hundred.” *1 percent* means $\frac{1}{100}$ or 0.01.

“48 percent of the students in our school are boys” means that out of every 100 students in the school, 48 are boys.

Percents are written in two ways: with the word *percent*, as in the sentence above, and with the symbol %.

Collect examples of percents. Look in newspapers, magazines, books, almanacs, and encyclopedias. Ask people at home to help. Write the examples below. Also tell where you found them. If an adult says you may, cut out examples and bring them to school.

Encyclopedia: 91% of the area of New Jersey is land, and 9% is covered by water.

Newspaper: 76 percent of the seniors in Southport High School say they plan to attend college next year.

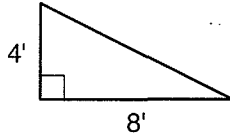
STUDY LINK
8·7

Areas of Triangles



Find the area of each triangle.

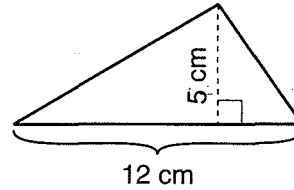
1.



Number model: _____

Area = _____ square feet

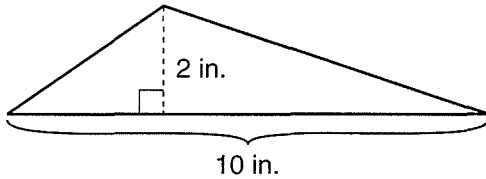
2.



Number model: _____

Area = _____ square cm

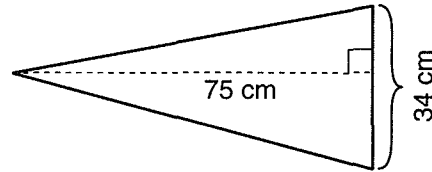
3.



Number model: _____

Area = _____ square in.

4.



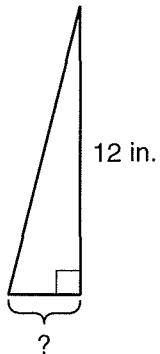
Number model: _____

Area = _____ square cm

Try This

The area of each triangle is given. Find the length of the base.

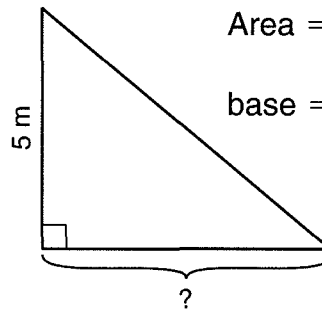
5.



Area = 18 in^2

base = _____ in.

6.



Area = 15 m^2

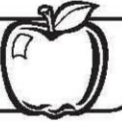
base = _____ m

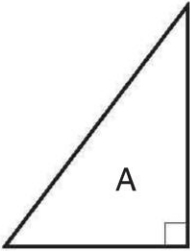
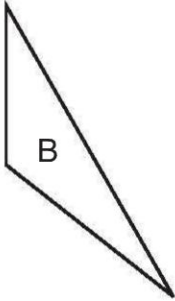
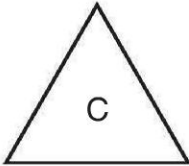
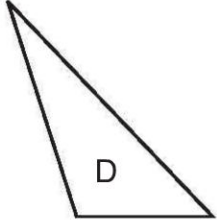
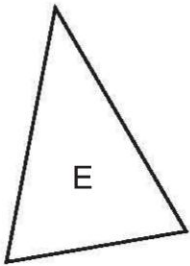
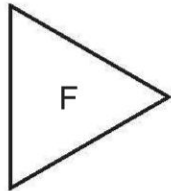
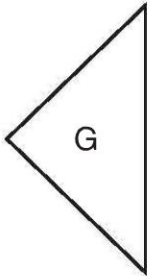
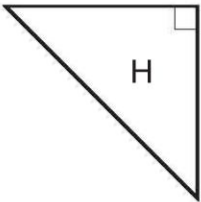
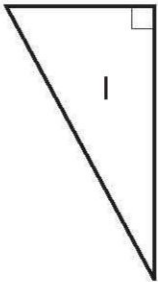

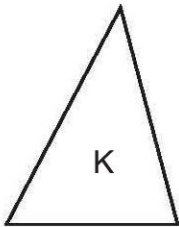
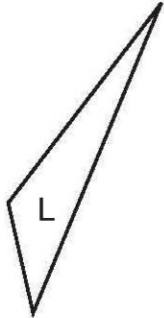
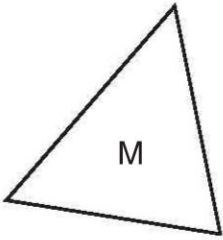
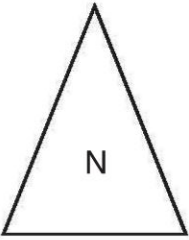
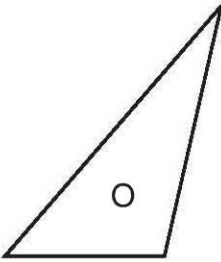
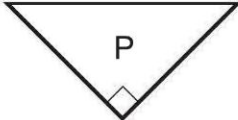
Practice

7. 18, _____, _____, 45, _____, 63, _____

8. _____, 16, _____, 32, _____, _____, 56

Exploring Triangle Properties



| | | | |
|---|---|--|---|
|  |  |  |  |
|  |  |  |  |
|  |  |  |  |
|  |  |  |  |

STUDY LINK
8•8

Turtle Weights



| Turtle | Weight (pounds) |
|----------------------|-----------------|
| Pacific leatherback | 1,552 |
| Atlantic leatherback | 1,018 |
| Green sea | 783 |
| Loggerhead | 568 |
| Alligator snapping | 220 |
| Flatback sea | 171 |
| Hawksbill sea | 138 |
| Kemps Ridley | 133 |
| Olive Ridley | 110 |
| Common snapping | 85 |

Source: *The Top 10 of Everything 2004*

- The Atlantic leatherback is about 10 times heavier than the _____ turtle.
- The loggerhead is about _____ times the weight of the common snapping turtle.
- Which turtle weighs about 3 times as much as the loggerhead? _____
- The flatback sea turtle and the alligator snapping turtle together weigh about half as much as the _____ turtle.
- About how many common snapping turtles would equal the weight of two alligator snapping turtles? _____
- The Atlantic leatherback is about $\frac{\square}{\square}$ the weight of the Pacific leatherback.

Practice

Name the factors.

- 50 _____
- 63 _____
- 90 _____

LESSON
8•9**Self Assessment**Progress
Check 8

Think about each skill listed below. Assess your own progress by checking the most appropriate box.

| Skills | I can do this on my own and explain how to do it. | I can do this on my own. | I can do this if I get help or look at an example. |
|--|---|--------------------------|--|
| 1. Add and subtract fractions. | | | |
| 2. Make a scale drawing. | | | |
| 3. Determine the probability of an event. | | | |
| 4. Find the perimeter of a polygon. | | | |
| 5. Count squares and fractions of squares to find the area of a polygon. | | | |
| 6. Use a formula to find the area of a rectangle, parallelogram, and triangle. | | | |



Fractions, Decimals, and Percents

In Unit 9, we will be studying percents and their uses in everyday situations. Your child should begin finding examples of percents in newspapers and magazines, on food packages, on clothing labels, and so on, and bring them to class. They will be used to illustrate a variety of percent applications.

As we study percents, your child will learn equivalent values for percents, fractions, and decimals. For example, 50% is equivalent to the fraction $\frac{1}{2}$ and to the decimal 0.5. The class will develop the understanding that **percent** always refers to a **part out of 100**.

Converting “easy” fractions, such as $\frac{1}{2}$, $\frac{1}{5}$, $\frac{1}{10}$, and $\frac{3}{4}$, to decimal and percent equivalents should become automatic for your child. Such fractions are common in percent situations and are helpful with more difficult fractions, decimals, and percents. To help memorize the “easy” fraction/percent equivalencies, your child will play *Fraction/Percent Concentration*.

| “Easy” Fractions | Decimals | Percents |
|---------------------|----------|----------|
| $\frac{1}{2}$ | 0.50 | 50% |
| $\frac{1}{4}$ | 0.25 | 25% |
| $\frac{3}{4}$ | 0.75 | 75% |
| $\frac{2}{5}$ | 0.40 | 40% |
| $\frac{7}{10}$ | 0.70 | 70% |
| $\frac{2}{2}$ | 1.00 | 100% |

Throughout the unit, your child will use a calculator to convert fractions to percents and will learn how to use the percent key ($\%$) to calculate discounts, sale prices, and percents of discount.

As part of the World Tour, your child will explore population data, such as literacy rates and percents of people who live in rural and urban areas.

Finally, the class will begin to apply the multiplication and division algorithms to problems that contain decimals. The approach used in *Everyday Mathematics* is straightforward: Students solve the problems as if the numbers were whole numbers. Then they estimate the answers to help them locate the decimal point in the exact answer. In this unit, we begin with fairly simple problems. Your child will solve more difficult problems in *Fifth* and *Sixth Grade Everyday Mathematics*.

Please keep this Family Letter for reference as your child works through Unit 9.

Vocabulary

Important terms in Unit 9:

discount The amount by which the regular price of an item is reduced in a sale, usually given as a fraction or percent of the original price, or as a “percent off.”

illiterate An illiterate person cannot read or write.

life expectancy The average number of years a person may be expected to live.

literate A literate person can read and write.

100% box The entire object, the entire collection of objects, or the entire quantity being considered.

100% box

24 books

percent (%) Per hundred or out of a hundred. For example, “48% of the students in the school are boys” means that, on average, 48 out of 100 students in the school are boys; $48\% = \frac{48}{100} = 0.48$

percent of literacy The percent of the total population that is literate; the number of people out of 100 who are able to read and write. For example, 92% of the population in Mexico is literate—this means that, on average, 92 out of 100 people can read and write.

percent or fraction discount The percent or fraction of the regular price that you save in a “percent off” sale. See example under *regular price*.

rank To put in order by size; to sort from smallest to largest or vice versa.

| Countries Ranked from Smallest to Largest Percent of Population, Rural | | |
|--|------------|-----|
| 1 | Australia | 8% |
| 2 | Japan | 21% |
| 3 | Russia | 27% |
| 4 | Iran | 33% |
| 5 | Turkey | 34% |
| 6 | China | 61% |
| 7 | Thailand | 68% |
| 8 | India | 72% |
| 9 | Vietnam | 74% |
| 10 | Bangladesh | 76% |

regular price or list price The price of an item without a discount.

| Regular Price | Sale! | Sale Price | You Saved |
|---------------|---------|------------|-----------|
| \$19.95 | 25% OFF | \$14.96 | \$4.99 |

rural In the country

sale price The amount you pay after subtracting the discount from the regular price. See example under *regular price*.

urban In the city

Do-Anytime Activities

To work with your child on the concepts taught in this unit, try these interesting and rewarding activities:

1. Help your child compile a percent portfolio that includes examples of the many ways percents are used in everyday life.
2. Encourage your child to incorporate such terms as “whole,” “halves,” “thirds,” and “fourths” into his or her everyday vocabulary.
3. Practice renaming fractions as percents, and vice versa, in everyday situations. For example, when preparing a meal, quiz your child on what percent $\frac{3}{4}$ of a cup would be.
4. Look through advertisements of sales and discounts. If the original price of an item and the percent of discount are given, have your child calculate the amount of discount and the sale price. If the original price and sale price are given, have your child calculate the amount and percent of discount.

Building Skills through Games

In this unit, your child will play the following games:

Fraction Match See *Student Reference Book*, page 243.

This game is for 2 to 4 players and requires one deck of *Fraction Match* cards. The game develops skill in naming equivalent fractions.

Fraction/Percent Concentration See *Student Reference Book*, page 246.

Two or three players need 1 set of Fraction/Percent Tiles and a calculator to play this game. Playing *Fraction/Percent Concentration* helps students recognize fractions and percents that are equivalent.

Over and Up Squares See *Student Reference Book*, page 257.

This is a game for 2 players and will require a playing grid. The game helps students practice using ordered pairs of numbers to locate points on a rectangular grid.

Polygon Pair-Up See *Student Reference Book*, page 258.

This game provides practice in identifying properties of polygons. It requires a *Polygon Pair-Up* Property Deck and Polygon Deck.

Rugs and Fences See *Student Reference Book*, pages 260 and 261.

This is a game for 2 players and requires a *Rugs and Fences* Polygon Deck, Area and Perimeter Deck, and Record Sheet. The game helps students practice computing the area and perimeter of polygons.

STUDY LINK
9•1

Fractions, Decimals, and Percents



Rename each decimal as a fraction and a percent.

1. $0.90 = \frac{\square}{100} = \underline{\hspace{1cm}}\%$ 2. $0.53 = \frac{\square}{100} = \underline{\hspace{1cm}}\%$ 3. $0.04 = \frac{\square}{100} = \underline{\hspace{1cm}}\%$

Rename each percent as a fraction and a decimal.

4. $60\% = \frac{\square}{100} = \underline{\hspace{1cm}}$ 5. $25\% = \frac{\square}{100} = \underline{\hspace{1cm}}$ 6. $7\% = \frac{\square}{100} = \underline{\hspace{1cm}}$

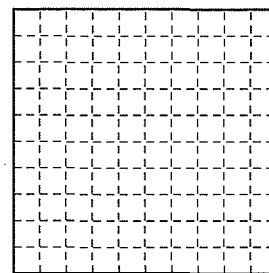
Rename each fraction as a decimal and a percent.

7. $\frac{50}{100} = \underline{\hspace{1cm}} = \underline{\hspace{1cm}}\%$ 8. $\frac{75}{100} = \underline{\hspace{1cm}} = \underline{\hspace{1cm}}\%$ 9. $\frac{6}{100} = \underline{\hspace{1cm}} = \underline{\hspace{1cm}}\%$

10. Shade more than $\frac{10}{100}$ and less than $\frac{30}{100}$ of the grid.
Write the value of the shaded part as a decimal and a percent.

Decimal: _____

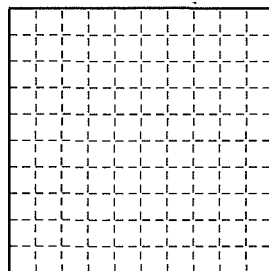
Percent: _____



11. Shade more than 25% and less than 60% of the grid.
Write the value of the shaded part as a decimal and a percent.

Decimal: _____

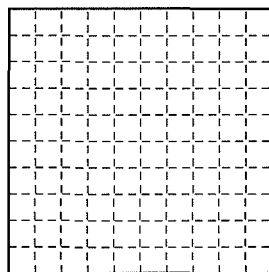
Percent: _____



12. Shade more than 0.65 and less than 0.85 of the grid.
Write the value of the shaded part as a decimal and a percent.

Decimal: _____

Percent: _____


Practice

Order the fractions from smallest to largest.

13. $\frac{3}{6}, \frac{3}{3}, \frac{3}{5}, \frac{3}{7}$ _____

14. $\frac{2}{3}, \frac{6}{7}, \frac{1}{2}, \frac{19}{20}$ _____

STUDY LINK
9•1

Trivia Survey



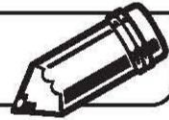
Conduct the survey below. The results will be used in Lesson 9-6.

Find at least five people to answer the following survey questions. You can ask family members, relatives, neighbors, and friends.

BE CAREFUL! You will not ask every person every question. Pay attention to the instructions that go with each question.

Record each answer with a tally mark in the Yes or No column.

| Question | Yes | No |
|--|-----|----|
| 1. Is Monday your favorite day? (Ask everyone younger than 20.) | | |
| 2. Have you gone to the movies in the last month? (Ask everyone older than 8.) | | |
| 3. Did you eat breakfast today? (Ask everyone over 25.) | | |
| 4. Do you keep a map in your car? (Ask everyone who owns a car.) | | |
| 5. Did you eat at a fast-food restaurant yesterday? (Ask everyone.) | | |
| 6. Did you read a book during the last month? (Ask everyone over 20.) | | |
| 7. Are you more than 1 meter tall? (Ask everyone over 20.) | | |
| 8. Do you like liver? (Ask everyone.) | | |

LESSON
9•2**Adding Tenths and Hundredths**

You can use base-10 blocks to model adding fractions with 10 and 100 in the denominator.

Use a long I to represent $\frac{1}{10}$.

Use a cube ■ to represent $\frac{1}{100}$.

Example: $\frac{3}{10} + \frac{23}{100} = \frac{53}{100}$

$$\text{III} + \text{II}\dots$$

Model the problems with longs and cubes. Record your answer.

1. $\frac{5}{10} + \frac{16}{100} =$ _____

2. $\frac{2}{100} + \frac{8}{10} =$ _____

3. Write your own problem. Have your partner solve it and record the answer.

Solve. You may use base-10 blocks or any other method.

4. $\frac{34}{100} + \frac{17}{100} =$ _____

5. $\frac{55}{100} + \frac{25}{100} =$ _____

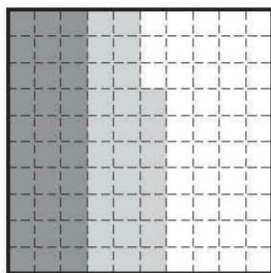
6. $\frac{33}{100} + \frac{4}{10} =$ _____

7. $\frac{9}{100} + \frac{7}{10} =$ _____

LESSON
9•2**Adding Tenths and Hundredths** *continued*

You can also model adding tenths and hundredths by shading a grid.

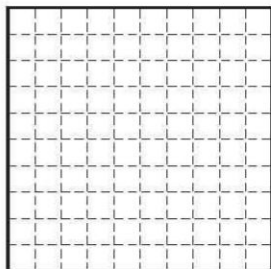
Example:



$$\frac{3}{10} + \frac{27}{100} = \frac{57}{100}$$

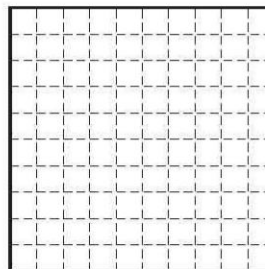
Shade the grid to help find the sum.

8.



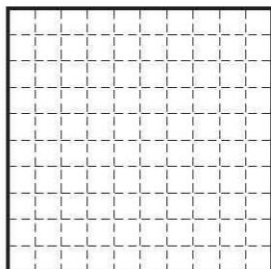
$$\frac{5}{10} + \frac{36}{100} = \underline{\hspace{2cm}}$$

9.



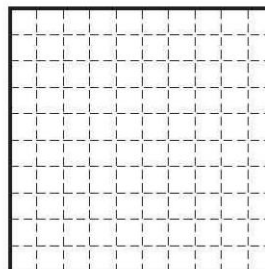
$$\frac{19}{100} + \frac{4}{10} = \underline{\hspace{2cm}}$$

10.



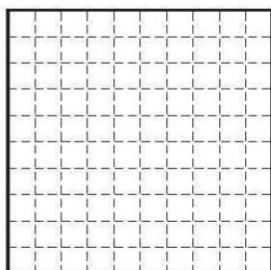
$$\frac{6}{10} + \frac{14}{100} = \underline{\hspace{2cm}}$$

11.



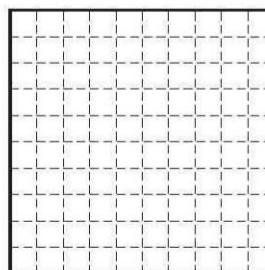
$$\frac{30}{100} + \frac{3}{10} = \underline{\hspace{2cm}}$$

12.



$$\frac{2}{10} + \frac{64}{100} = \underline{\hspace{2cm}}$$

13.



$$\frac{9}{100} + \frac{9}{10} = \underline{\hspace{2cm}}$$

STUDY LINK
9•2

Coins as Percents of \$1



1. How many pennies in \$1? _____ What fraction of \$1 is 1 penny? _____

Write the decimal that shows what part of \$1 is 1 penny. _____

What percent of \$1 is 1 penny? _____%

2. How many nickels in \$1? _____ What fraction of \$1 is 1 nickel? _____

Write the decimal that shows what part of \$1 is 1 nickel. _____

What percent of \$1 is 1 nickel? _____%

3. How many dimes in \$1? _____ What fraction of \$1 is 1 dime? _____

Write the decimal that shows what part of \$1 is 1 dime. _____

What percent of \$1 is 1 dime? _____%

4. How many quarters in \$1? _____ What fraction of \$1 is 1 quarter? _____

Write the decimal that shows what part of \$1 is 1 quarter. _____

What percent of \$1 is 1 quarter? _____%

5. How many half-dollars in \$1? _____ What fraction of \$1 is 1 half-dollar? _____

Write the decimal that shows what part of \$1 is 1 half-dollar. _____

What percent of \$1 is 1 half-dollar? _____%

6. Three quarters (75¢) is $\frac{3}{4}$ of \$1.

Write the decimal. _____

What percent of \$1 is

3 quarters? _____%

7. Two dimes (20¢) is $\frac{2}{10}$ of \$1.

Write the decimal. _____

What percent of \$1 is

2 dimes? _____%

Practice

8. _____ = $748 * 6$ 9. $51 * 90 =$ _____ 10. _____ = $28 * 903$

STUDY LINK
9•3

Calculator Decimals



1. Use your calculator to rename each fraction below as a decimal.

| | | | | | | | |
|----------------|---|---|---|---|---|---|---|
| $\frac{1}{2}$ | 0 | . | 5 | | | | |
| $\frac{1}{3}$ | 0 | . | 3 | 3 | 3 | 3 | 3 |
| $\frac{1}{4}$ | | | | | | | |
| $\frac{1}{5}$ | | | | | | | |
| $\frac{1}{6}$ | | | | | | | |
| $\frac{1}{7}$ | | | | | | | |
| $\frac{1}{8}$ | | | | | | | |
| $\frac{1}{9}$ | | | | | | | |
| $\frac{1}{10}$ | | | | | | | |
| $\frac{1}{11}$ | | | | | | | |
| $\frac{1}{12}$ | | | | | | | |
| $\frac{1}{13}$ | | | | | | | |

| | | | | | | | |
|----------------|--|--|--|--|--|--|--|
| $\frac{1}{14}$ | | | | | | | |
| $\frac{1}{15}$ | | | | | | | |
| $\frac{1}{16}$ | | | | | | | |
| $\frac{1}{17}$ | | | | | | | |
| $\frac{1}{18}$ | | | | | | | |
| $\frac{1}{19}$ | | | | | | | |
| $\frac{1}{20}$ | | | | | | | |
| $\frac{1}{21}$ | | | | | | | |
| $\frac{1}{22}$ | | | | | | | |
| $\frac{1}{23}$ | | | | | | | |
| $\frac{1}{24}$ | | | | | | | |
| $\frac{1}{25}$ | | | | | | | |

2. Make up some of your own.

| | | | | | | | | |
|----------------|---|---|---|---|---|---|---|---|
| $\frac{1}{73}$ | 0 | . | 0 | 1 | 3 | 6 | 9 | 8 |
| $\frac{1}{}$ | | | | | | | | |
| $\frac{1}{}$ | | | | | | | | |

| | | | | | | | |
|--------------|--|--|--|--|--|--|--|
| $\frac{1}{}$ | | | | | | | |
| $\frac{1}{}$ | | | | | | | |
| $\frac{1}{}$ | | | | | | | |

Practice

3. $6 \overline{)96} = \underline{\hspace{2cm}}$

4. $91 \div 5 = \underline{\hspace{2cm}}$

5. $\underline{\hspace{2cm}} = 864 \div 8$

6. $575 \div 7 = \underline{\hspace{2cm}}$

STUDY LINK
9•4
Fractions and Decimals to Percents


Do NOT use a calculator to convert these fractions to percents.

On the back of this page, show your work for Problems 3–6.

1. $\frac{34}{100} = \underline{\hspace{2cm}}\%$

2. $\frac{67}{100} = \underline{\hspace{2cm}}\%$

3. $\frac{42}{50} = \underline{\hspace{2cm}}\%$

4. $\frac{13}{25} = \underline{\hspace{2cm}}\%$

5. $\frac{17}{20} = \underline{\hspace{2cm}}\%$

6. $\frac{25}{125} = \underline{\hspace{2cm}}\%$

Use a calculator to convert these fractions to percents.

7. $\frac{23}{92} = \underline{\hspace{2cm}}\%$

8. $\frac{12}{40} = \underline{\hspace{2cm}}\%$

9. $\frac{20}{32} = \underline{\hspace{2cm}}\%$

10. $\frac{49}{70} = \underline{\hspace{2cm}}\%$

11. $\frac{60}{400} = \underline{\hspace{2cm}}\%$

12. $\frac{21}{56} = \underline{\hspace{2cm}}\%$

13. Describe how you used your calculator to convert the fractions in Problems 7–12 to percents.

Do NOT use a calculator to convert these decimals to percents.

14. $0.86 = \underline{\hspace{2cm}}\%$

15. $0.03 = \underline{\hspace{2cm}}\%$

16. $0.140 = \underline{\hspace{2cm}}\%$

17. $0.835 = \underline{\hspace{2cm}}\%$

Practice

Order the fractions from smallest to largest.

18. $\frac{7}{16}, \frac{7}{8}, \frac{7}{12}, \frac{7}{9}$ _____

19. $\frac{7}{15}, \frac{3}{15}, \frac{8}{15}, \frac{4}{15}$ _____

20. $\frac{5}{9}, \frac{15}{16}, \frac{1}{4}, \frac{9}{10}$ _____

STUDY LINK
9•5

Renaming Fractions as Percents



In 2001, there were about 2,317,000 marriages in the United States.

The table below shows the approximate number of marriages each month.

- Use a calculator to find the percent of the total number of marriages that occurred each month. Round the answers to the nearest whole-number percent.

| Month | Approximate Number of Marriages | Approximate Percent of Total Marriages |
|-----------|---------------------------------|--|
| January | 147,000 | 6% |
| February | 159,000 | |
| March | 166,000 | |
| April | 166,000 | |
| May | 189,000 | |
| June | 237,000 | |
| July | 244,000 | |
| August | 225,000 | |
| September | 224,000 | |
| October | 217,000 | |
| November | 191,000 | |
| December | 152,000 | |

Source: U.S. Department of Health and Human Services

- According to the table, what is the most popular month for a wedding? _____
 What is the least popular month for a wedding? _____
- Describe how you used your calculator to find the percent for each month.

Practice

Name all the factors of each number.

4. 63 _____

5. 28 _____

STUDY LINK
9•6

Use Percents to Compare Fractions



1. The girls' varsity basketball team won 8 of the 10 games it played. The junior varsity team won 6 of 8 games. Which team has the better record? Explain your reasoning.

2. Complete the table of shots taken (not including free throws) during a game. Calculate the percent of shots made to the nearest whole percent.

| Player | Shots Made | Shots Missed | Total Shots | $\frac{\text{Shots Made}}{\text{Total Shots}}$ | % of Shots Made |
|--------|------------|--------------|-------------|--|-----------------|
| 1 | 5 | 12 | 17 | $\frac{5}{17}$ | 29% |
| 2 | 5 | 6 | | | |
| 3 | 3 | 0 | | | |
| 4 | 9 | 2 | | | |
| 5 | 4 | 3 | | | |
| 6 | 11 | 5 | | | |
| 7 | 6 | 4 | | | |
| 8 | 1 | 1 | | | |

3. The basketball game is tied. Your team has the ball. There is only enough time for one more shot. Based only on the information in the table, which player would you choose to take the shot? Why?

Practice

4. $\frac{1}{3} + \frac{1}{6} =$ _____ 5. _____ $= \frac{3}{4} - \frac{1}{2}$ 6. _____ $= \frac{7}{10} + \frac{1}{5}$ 7. $\frac{5}{8} - \frac{1}{4} =$ _____

STUDY LINK
9·7

Least-Populated Countries



The table below shows the approximate population for the 10 least-populated countries in the world. Use the data to estimate answers to the problems.

| Country | Population |
|---------------------|------------|
| Vatican City | 900 |
| Tuvalu | 11,000 |
| Nauru | 13,000 |
| Palau | 20,000 |
| San Marino | 28,000 |
| Monaco | 32,000 |
| Liechtenstein | 33,000 |
| St. Kitts and Nevis | 39,000 |
| Antigua and Barbuda | 68,000 |
| Dominica | 69,000 |

Source: *Top Ten of Everything 2004*

- The population of Liechtenstein is about _____% of the population of Dominica.
- What country's population is about 33% of Liechtenstein's population? _____
- The population of Vatican City is about _____% of the population of Palau.
- The population of the 10 countries listed is 314,900. What 3 country populations together equal about 50% of that total?

- The population of St. Kitts and Nevis is about _____% of Nauru's population.

Practice

- $27 * 4 =$ _____
- _____ = $508 * 8$
- _____ = $63 * 86$
- $849 * 52 =$ _____

STUDY LINK
9•8

Multiplying Decimals



For each problem below, the multiplication has been done correctly, but the decimal point is missing in the answer. Correctly place the decimal point in the answer.

1. $6 * 4.3 = 258$

2. $72 * 6.8 = 4896$

3. $0.96 * 47 = 4512$

4. $5.12 * 22 = 11264$

5. $8,457 * 9.8 = 828786$

6. $0.04 * 140 = 56$

7. Explain how you decided where to place the decimal point in Problem 4.

Try This

Multiply. Show your work.

8. $5.9 * 36 = \underline{\hspace{2cm}}$

9. $0.46 * 84 = \underline{\hspace{2cm}}$

10. $\underline{\hspace{2cm}} = 7.21 * 53$

Practice

11. $\underline{\hspace{2cm}} = 96 \div 6$

12. $4 \overline{)67} = \underline{\hspace{2cm}}$

13. $\underline{\hspace{2cm}} = 411 \div 3$

14. $9 \overline{)903} = \underline{\hspace{2cm}}$

**PROJECT
6****U.S. Traditional Multiplication: Decimals 1****Algorithm Project 6**

Use any strategy to solve the problem.

1. A turkey sandwich at Jason's Deli costs \$5.98.
What is the cost of 4 turkey sandwiches?

\$ _____

Use U.S. traditional multiplication to solve each problem. Use estimation or count decimal places to place the decimal point in your answers.

2. $12.64 * 5 =$ _____

3. $\$9.12 * 23 = \$$ _____

4. $\$$ _____ $= 86 * \$0.57$

5. $3 * \$45.80 = \$$ _____

6. _____ $= 50.7 * 65$

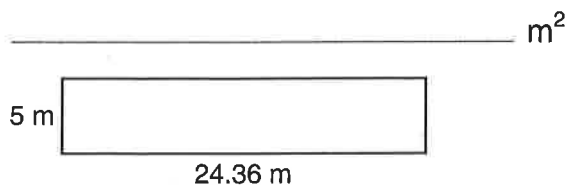
7. $426 * 5.3 =$ _____

**PROJECT
6****U.S. Traditional Multiplication: Decimals 2**

Algorithm Project 6

Use U.S. traditional multiplication to solve each problem. Use estimation or count decimal places to place the decimal point in your answers.

1. Find the area of the rectangle.



2. $18 * 30.09 =$ _____

3. $\$24.05 * 6 = \$$ _____

4. _____ = $34 * 0.67$

5. $\$8.53 * 76 = \$$ _____

6. _____ = $2.3 * 5,084$

7. $\$5.21 * 4 = \$$ _____

PROJECT
6

U.S. Traditional Multiplication: Decimals 3



Algorithm Project 6

Use U.S. traditional multiplication to solve each problem. Use estimation or count decimal places to place the decimal point in your answers.

1. The average weight of a beagle puppy at birth is about 0.25 kg. At 6 months, a male beagle can weigh about 32 times as much. About how much can a 6-month-old male beagle weigh?

_____ kg

2. Write a number story for 4.6×28 .
Solve your number story.

Fill in the missing digits in the multiplication problems.

3.

$$\begin{array}{r}
 \square \\
 \square \\
 \hline
 8.62 \\
 * \quad \quad 43 \\
 \hline
 2\square8\square \\
 + \square44\square0 \\
 \hline
 3\square0.6\square
 \end{array}$$

4.

$$\begin{array}{r}
 4\square\square \\
 \square6.38 \\
 * \quad \quad \quad 7 \\
 \hline
 32\square.6\square
 \end{array}$$

**PROJECT
6****U.S. Traditional Multiplication: Decimals 4****Algorithm Project 6**

Use U.S. traditional multiplication to solve each problem. Use estimation or count decimal places to place the decimal point in your answers.

1. Alicia has 7 pieces of yarn. Each piece is 3.65 meters long. What is the combined length of all 7 pieces?

_____ m

2. Write a number story for $5 * \$48.30$.
Solve your number story.

Fill in the missing digits in the multiplication problems.

3.

$$\begin{array}{r}
 1 \\
 \square \\
 40.9 \\
 * 23 \\
 \hline
 \square\square2\square \\
 + \square\square8\square \\
 \hline
 \square4\square.7
 \end{array}$$

4.

$$\begin{array}{r}
 \square \\
 5 \\
 \square70 \\
 * 6.8 \\
 \hline
 45\square\square \\
 + \square4\square00 \\
 \hline
 3\square7\square.0
 \end{array}$$

STUDY LINK
9•9

Dividing Decimals



For each problem below, the division has been done correctly, but the decimal point is missing in the answer. Correctly place the decimal point in the answer.

1. $88.8 / 6 = 148$

2. $1.35 / 5 = 2700$

3. $99.84 / 4 = 2496$

4. $2.58 / 3 = 860$

5. $163.8 / 7 = 234$

6. $233.28 / 4 = 5832$

7. Explain how you decided where to place the decimal point in Problem 3.

Try This

Divide. Show your work.

8. $6 \overline{)25.2}$

Answer: _____

9. $4 \overline{)154.8}$

Answer: _____

10. $9 \overline{)5.85}$

Answer: _____

Practice

11. _____ = $\frac{5}{8} + \frac{2}{8}$

12. $\frac{5}{9} - \frac{1}{3} =$ _____

13. _____ = $\frac{7}{10} + \frac{2}{10}$

14. $\frac{9}{10} - \frac{1}{2} =$ _____

**PROJECT
7****Long Division with One-Digit Divisors****Algorithm Project 7**

Use any strategy to solve the problem.

1. The fourth-grade classes at Glendale School put on puppet shows for their families and friends. Ticket sales totaled \$532, which the four classes are to share equally. How much should each class get?

\$ _____

Be ready to explain how you found your answer.

Use U.S. traditional long division to solve each problem.

2. $78 \div 6 =$ _____

3. $288 \div 8 =$ _____

4. _____ $= 564 \div 3$

5. _____ $= 763 \div 7$

**PROJECT
7****Long Division with One-Digit Divisors** *cont.***Algorithm Project 7**

6. $350 / 4 \rightarrow$ _____

7. $802 / 9 \rightarrow$ _____

8. _____ $\leftarrow 869 / 7$

9. _____ $\leftarrow 874 / 5$

**PROJECT
7****Long Division with One-Digit Divisors *cont.*****Algorithm Project 7**

- 10.** Eight people visited a marine theme park. The total cost of the single-day admission tickets was \$424. What was the cost per ticket?

\$ _____

- 11.** A national park charges an entrance fee of \$3 per person. A school group visited the site. The cost was \$288. How many people were in the school group?

_____ people

- 12.** A family went on a six-day boat cruise. They sailed a total of 432 miles. They sailed the same distance each day. How far did they travel each day?

_____ miles

- 13.** Four friends have birthdays in the same month. They decide to rent a hall to have a birthday party and split the cost evenly. The cost of renting the hall for one day is \$172. How much did each friend pay?

\$ _____

PROJECT
8

Long Division with Larger Dividends



Algorithm Project 8

Use any strategy to solve the problem.

1. Four friends were playing a board game. Jen had to leave to go to her piano lesson. The three other players decided to divide Jen's money equally. Jen had \$4,353. How much should each of the three other players get?

\$ _____

Be ready to explain how you got your answer.

Use U.S. traditional long division to solve each problem.

2. $\$5,385 \div 5 = \$$ _____

3. $\$7,896 \div 6 = \$$ _____

4. _____ = $8,575 \div 7$

5. _____ = $8,127 \div 3$

PROJECT
8Long Division with Larger Dividends *cont.*

Algorithm Project 8

Fill in the missing numbers.

6.

$$\begin{array}{r}
 1 \square 39 \\
 5 \overline{) 8695} \\
 \underline{- 5} \\
 36 \\
 \underline{- 35} \\
 \square 9 \\
 \underline{- 15} \\
 4 \square \\
 \underline{- 45} \\
 0
 \end{array}$$

7.

$$\begin{array}{r}
 5 \square \square \\
 6 \overline{) 3252} \\
 \underline{- \square 0} \\
 2 \square \\
 \underline{- 24} \\
 12 \\
 \underline{- 1 \square} \\
 0
 \end{array}$$

8. Jai is saving money to go to sleep-away camp next summer. The total cost is \$1,092. He is earning money by walking dogs in his neighborhood.

a. At \$4 per walk, how many dogs will Jai need to walk to earn \$1,092?

_____ dogs

b. At \$7 per walk, how many dogs will Jai need to walk to earn \$1,092?

_____ dogs

PROJECT
8

Long Division with Dollars and Cents



Algorithm Project 8

1. Dennis solved $\$9.45 / 7$ like this.

a. Study Dennis's work.

b. Explain to your partner how he solved the problem.

$$\begin{array}{r} 1.35 \\ 7 \overline{)9.45} \\ \underline{-7} \\ 24 \\ \underline{-21} \\ 35 \\ \underline{-35} \\ 0 \end{array}$$

Solve these division problems using Dennis's method.

2. $\$8.92 / 4 = \$$ _____

3. $\$7.56 / 6 = \$$ _____

4. _____ = $15.76 / 8$

5. _____ = $19.17 / 9$

LESSON
9•10**Self Assessment**Progress
Check 9

Think about each skill listed below. Assess your own progress by checking the most appropriate box.

| Skills | I can do this on my own and explain how to do it. | I can do this on my own. | I can do this if I get help or look at an example. |
|--|---|--------------------------|--|
| 1. Solve “fraction-of” problems like these: $\frac{1}{4}$ of 20 $\frac{3}{5}$ of 15 | | | |
| 2. Solve discount number stories. | | | |
| 3. Rename fractions like these as decimals and percents: $\frac{15}{100}$, $\frac{6}{10}$, $\frac{3}{4}$, $\frac{1}{5}$ | | | |
| 4. Solve decimal multiplication and division problems like these: $4.5 * 7$ $56.7 / 5$ $9.82 * 6$ $345.6 / 4$ | | | |
| 5. Find the area and perimeter of rectangles, parallelograms, and triangles. | | | |
| 6. Use parentheses in number sentences. | | | |