



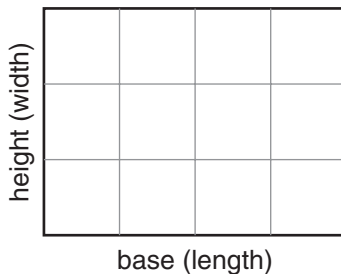
## Perimeter and Area

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)

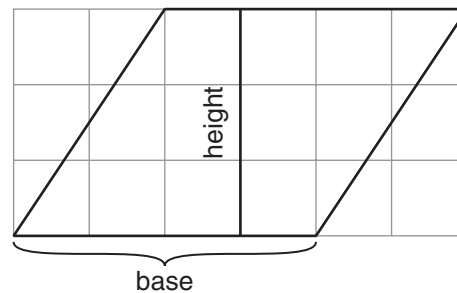
$$A = b * h \text{ (or } l * w)$$



### Area of a Parallelogram

Area = base \* height

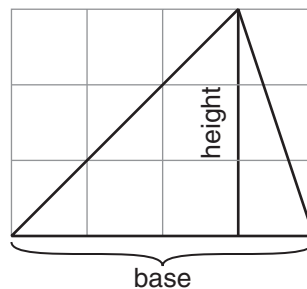
$$A = b * h$$



### 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.

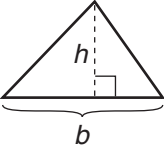
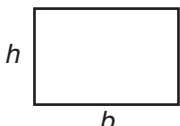
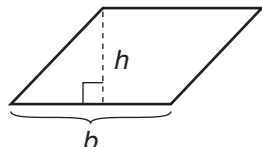
The World Tour will continue. Students will examine how geographical areas are measured and the difficulties in making accurate measurements. They will compare areas for South American countries by using division to calculate the ratio of areas.

**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.

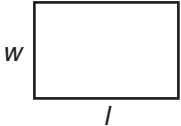
<p>Area of a triangle</p>  <p><math>A = \frac{1}{2} * b * h</math></p>	<p>Area of a rectangle</p>  <p><math>A = b * h</math></p>
<p>Area of a parallelogram</p>  <p><math>A = b * h</math></p>	

**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.

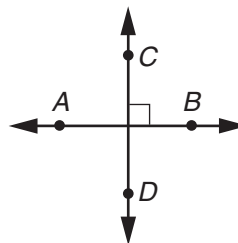
**perimeter** The distance around a 2-dimensional shape along the boundary of the shape. The perimeter of a circle is called its circumference. The perimeter of a polygon is the sum of the lengths of its sides.

Perimeter of a rectangle



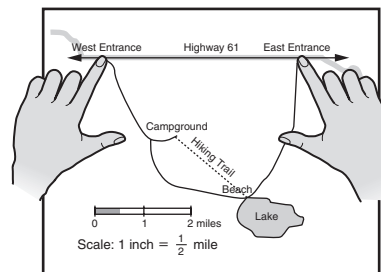
$P = l + w + l + w$   
 $= 2 * (l + w)$

**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  $\sqcup$  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.

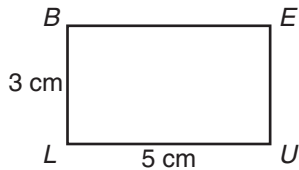
# As You Help Your Child with Homework

As your child brings assignments home, you may want to go over the instructions together, clarifying them as necessary. The answers listed below will guide you through some of the Study Links in this unit.

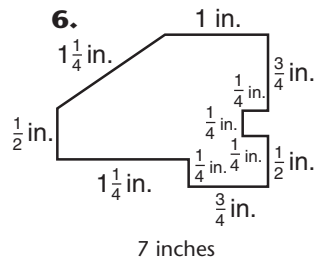
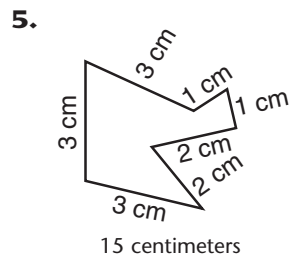
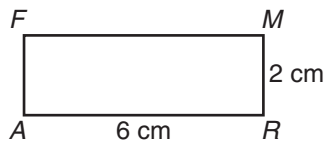
## Study Link 8•1

1. 17 feet                      2. 54 inches

3. Sample answer:



4. Sample answer:



## Study Link 8•2

1. a. 52 miles                      b. 117 miles  
c.  $32\frac{1}{2}$  miles                      d.  $175\frac{1}{2}$  miles

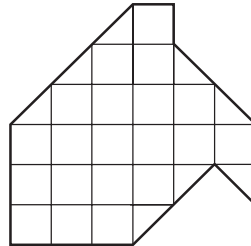
3.

Rectangle	Height in Drawing	Actual Height
A	$\frac{1}{2}$ in.	12 ft
B	$1\frac{1}{4}$ in.	30 ft
C	2 in.	48 ft
D	$1\frac{3}{4}$ in.	42 ft
E	1 in.	24 ft

## Study Link 8•3

1. 24 square centimeters  
2. 24 square centimeters

## 2., continued Sample answer:



3. 2,072    4. 11,740    5. 3,593    6. 2,848

## Study Link 8•4

1. 87,500; 35 grid squares  
2. 17,500; 7 grid squares  
3. 88.71    4. 58.08    5. 386.174    6. 18.098

## Study Link 8•5

1. 48 square feet    2. 21 square inches  
3. 864 square centimeters  
4. 300 square meters  
5. 9 inches                      6. 10 centimeters  
7. 9, 15, 18, 21                      8. 28, 35, 49, 56  
9. 36, 54, 60, 66                      10. 24, 48, 72, 84

## Study Link 8•6

1.  $9 * 4 = 36$                       2.  $3 * 8 = 24$   
3.  $4 * 6 = 24$                       4.  $65 * 72 = 4,680$   
5. 13 inches                      6. 85 meters

## Study Link 8•7

1.  $\frac{1}{2} * (8 * 4) = 16$     2.  $\frac{1}{2} * (12 * 5) = 30$   
3.  $\frac{1}{2} * (10 * 2) = 10$   
4.  $\frac{1}{2} * (34 * 75) = 1,275$   
5. 3 inches                      6. 6 meters  
7. 27, 36, 54, 72                      8. 8, 24, 40, 48