

# • Rectangular Prisms

## Power Up

### facts

Power Up 71

### jump start

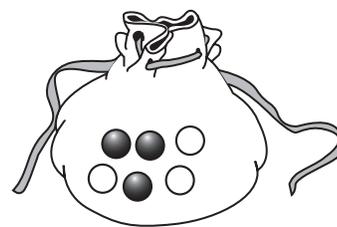
 Count up by 25s from 0 to 250.  
Count up by 7s from 0 to 77.

 It is 5:05 in the morning. Draw hands on your clock to show the time in 15 minutes. Write the time in digital form.

 The temperature in a restaurant kitchen was  $28^{\circ}\text{C}$ . It was 9 degrees cooler in the dining room. Mark your thermometer to show the temperature in the dining room.

### mental math

- Number Sense:**  $35 + 9$
- Number Sense:**  $5 + 4 + 4 + 5$
- Time:** 45 minutes + 15 minutes
- Fractions:** What fraction of the marbles are white?



### problem solving

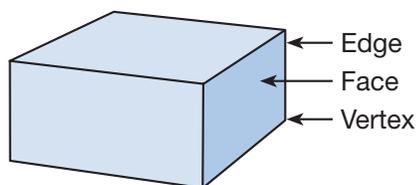
Quinh plans to watch his favorite television show tonight. He told his mother that the show will begin in 14 minutes and will be over in 74 minutes. How long is Quinh's favorite television show?

## New Concept

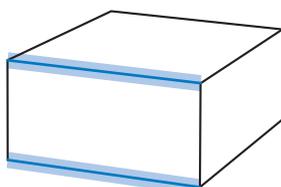
Boxes come in different sizes and can be made of different materials. However, most boxes are alike in many ways. In this lesson we will study the shape of rectangular boxes. The shape of a rectangular box is called a **rectangular prism** or **rectangular solid**.

Rectangular prisms have flat sides shaped like rectangles. These flat surfaces are called **faces**. Two faces meet at an **edge**. Three faces meet at a point. These corner points are called *vertices*. Each corner point is a **vertex**.

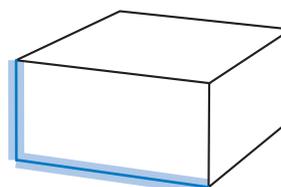
Rectangular Prism



Some of the edges of a rectangular prism are parallel and some edges are perpendicular.

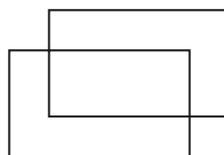


parallel edges

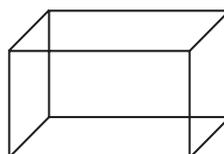


perpendicular edges

If we draw a “transparent” rectangular prism, we can see all the faces, edges, and vertices. First, we draw two overlapping rectangles that are **congruent**.



Then we connect the four vertices of one rectangle to the matching vertices of the other rectangle.



**Represent** Practice drawing a rectangular prism.

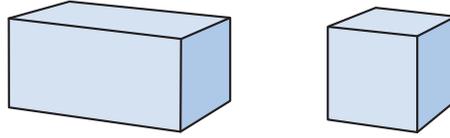
**Example 1**

**How many faces does a box have?**

Place a box in front of you. See that it has a front and a back, a top and a bottom, and a left side and a right side. **A box has six faces.**

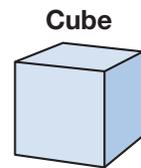
## Example 2

Compare these two boxes. Describe how they are alike and how they are different.



Both boxes are rectangular prisms. They each have 6 faces, 12 edges, and 8 vertices. Both boxes have rectangular faces. The boxes are different because the faces of the box on the left are longer than they are wide. The faces of the box on the right are all squares.

If every face of a rectangular prism is a square, then the figure is a **cube**. The box on the right in example 2 is a cube. All the edges of a cube are the same length.



## Lesson Practice

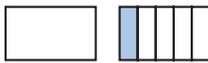
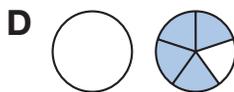
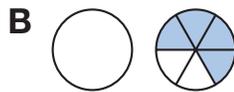
- Draw a picture of a transparent box.
- How many vertices does a box have?
- How many edges does a box have?
- Describe a cube.

## Written Practice

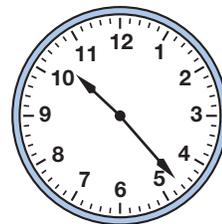
*Distributed and Integrated*

- 1. Formulate** <sup>(20, 28)</sup> Molly counted the cars as the train rolled by the intersection. There were 103 cars, counting four engines and the caboose. How many cars were there not counting the engines and caboose? Write a number sentence. Then write your answer in a complete sentence.
- 2.** <sup>(22)</sup> Hawkins bought two round-trip train tickets to Grant's Pass for \$9.75 each. What was the cost for both tickets?
- 3.** <sup>(26)</sup> Hawkins paid for the two tickets in problem 2 with a \$20 bill. How much money should he get back?

4. **Multiple Choice** Which picture below shows the mixed number  $1\frac{4}{5}$ ?



5. It is morning. The clock shows the time the train arrived in Chicago. Write the time in digital form.



6. Are the rails of train tracks parallel or perpendicular?

7. The distance from the Upland Station to Burns Crossing is  $17\frac{3}{10}$  miles. Use words to name  $17\frac{3}{10}$ .

8. Find each product.

(70)

a.  $8 \times 7$

b.  $4 \times 7$

c.  $6 \times 7$

9. Find each product.

(70)

a.  $3 \times 8$

b.  $4 \times 8$

c.  $6 \times 8$

10. Find each product.

(64)

a.  $9 \times 4$

b.  $9 \times 6$

c.  $9 \times 8$

11. **Represent** Follow the directions in this lesson to draw a rectangular prism.

(71)

12. A rectangular prism has how many faces?

(71)

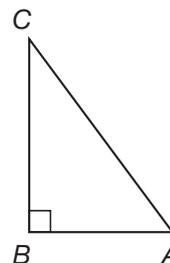
13. Use your inch ruler to find the length of the sides of the right triangle.

(35, 69)

a. side  $AB$

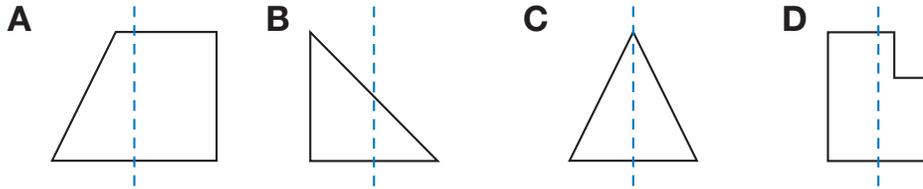
b. side  $BC$

c. side  $CA$



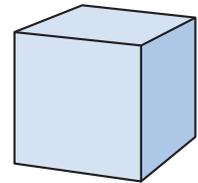
**14.** **Represent** (68, 69) On your paper draw a triangle congruent to the triangle in problem 13.

**15.** **Multiple Choice** (Inv. 7) Which polygon shows a line of symmetry?



**16.** (29) Martin has three quarters in his pocket. What fraction of a dollar is three quarters?

**17.** (71) If every face of a rectangular prism is a square, then what is the name of the solid?



**18.** (24)  $\$32 + \$68 + \$124$

**19.** (26, 28)  $\$206 - \$78$

**20.** (33) Which number on the number line does point  $M$  represent?



**Early Finishers**  
Real-World Connection

Mr. Tuff is making a rectangular table that is 4 feet long and 3 feet wide. Draw the table using the scale  $\frac{1}{2}$  inch = 1 foot.

## • Counting Cubes

## Power Up

## facts

Power Up 72

jump  
start

- 1**<sub>2</sub><sub>3</sub> Count up by 11s from 0 to 110.  
Count up by 5s from 3 to 53.



Write 10,550 as words.



Draw an isosceles triangle. Trace the sides that have equal length with a crayon.

mental  
math

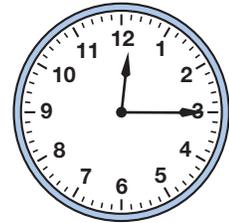
- a. **Number Sense:** Compare these numbers using the symbol  $<$ ,  $>$ , or  $=$

$$2,560 \bigcirc 2,690$$

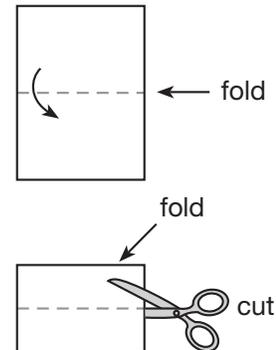
- b. **Money:**  $\$10.00 - \$5.25$

- c. **Number Sense:**  $200 - 80$

- d. **Time:** It is afternoon. Marta went to the library at the time shown on the clock. She left 1 hour later. What time did she leave the library?

problem  
solving

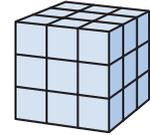
A sheet of paper is folded in half and then cut with scissors as shown. How many pieces of paper will there be after the cut?



## New Concept

Andre uses a forklift to load boxes into a boxcar. Look at this stack of boxes. Can you count the number of boxes in the stack?

We cannot see all the boxes in the stack. One way to find the total is to first find the number of boxes in each layer.



Looking at the top of the stack, we see that there are nine boxes in the top layer.

Looking at the side, we see that there are three layers of boxes.

To find the total number of boxes, we can add:  $9 + 9 + 9 = 27$ . We can also multiply:  $3 \times 9 = 27$ .

**Formulate** If we add two more layers of boxes to the stack, how many boxes will we have altogether? Write a multiplication fact to show the answer.

### Activity

#### Counting Cubes

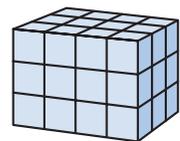
Use cubes to build the stacks of cubes shown on **Lesson Activity 27**. Answer these questions for each stack of cubes.

- How many cubes are in one layer?
- How many layers are there?
- How many cubes are there in all?

#### Example 1

The picture shows a stack of cubes.

- How many cubes are in each layer?
- How many layers are there?
- How many cubes are there in all?
  - There are **12 cubes** in each layer.
  - There are **three layers**.



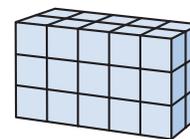
- c. Three layers with 12 cubes in each layer means there are **36 cubes in all**.

$$12 + 12 + 12 = 36 \text{ or } 3 \times 12 = 36$$

### Lesson Practice

A box is filled with cubes, as shown at right.

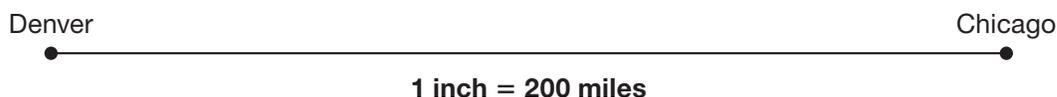
- How many cubes are in each layer?
- How many layers are there?
- How many cubes are there?



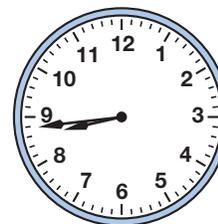
### Written Practice

*Distributed and Integrated*

- <sup>(20)</sup> Sidney was on a 480-mile trip. When the train stopped in Omaha, Sidney had traveled 256 miles. How much farther did Sidney have to travel?
- <sup>(18)</sup> **Formulate** It is 185 miles from Elam to Junction City. How far is it from Elam to Junction City and back? Write a number sentence.
- <sup>(Inv. 4)</sup> Livestock were hauled east from Denver, Colorado, to Chicago, Illinois. Use the scale and your ruler to find the approximate distance from Denver to Chicago.



- <sup>(38)</sup> It is morning in Chicago. Write the time shown at right in digital form.
- <sup>(59, 64)</sup> Find each product. You may use the multiplication table.
  - $7 \times 2$
  - $7 \times 5$
  - $7 \times 9$
- <sup>(70)</sup> Find each product.
  - $8 \times 4$
  - $8 \times 6$
  - $8 \times 7$
- <sup>(70)</sup> Find each product.
  - $6 \times 3$
  - $6 \times 4$
  - $6 \times 7$



- <sup>(64)</sup> Find each product.

a.  $9 \times 3$

b.  $9 \times 7$

c.  $9 \times 9$

9. **Represent** In Lesson 71 we learned how to draw a rectangular prism. Use the same process to draw a cube. (*Hint: Begin by drawing two overlapping squares.*)

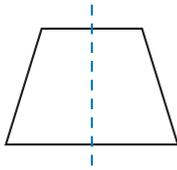
10. What is the shape of every face of a cube?

11. A rectangular prism has how many edges?

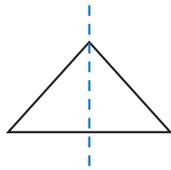
12. **Multiple Choice** Which polygon does *not* show a line of symmetry?

(Inv. 7)

A



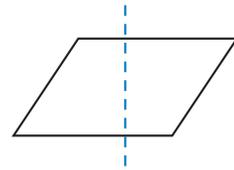
B



C

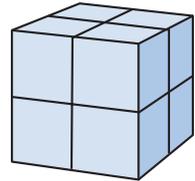


D



13. Harold put some small cubes together to make this larger cube. How many small cubes make the larger cube?

(72)



Use polygon *ABCD* and a ruler to answer problems 14–16.

14. a. How long is each side of the polygon?

(35, 58)

b. What is the perimeter of the polygon?

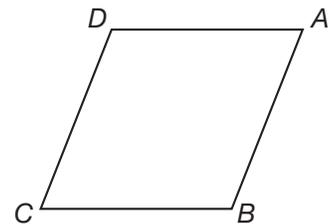
15. What is the shape of the polygon?

(66)

16. a. Which two angles are obtuse?

(65, 66)

b. Which two angles are acute?



17. **Conclude** The numbers below make a pattern on a multiplication table. What are the next three numbers in this pattern?

(55, 61)

0, 1, 4, 9, 16, 25, \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_, ...

18.  $36\text{¢} + 74\text{¢} + \$2$

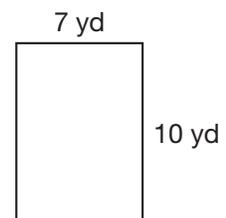
(22, 24)

19.  $\$2.00 - \$1.26$

(26, 28)

20. A driveway is 10 yd long and 7 yd wide. What is the area of the driveway?

(62, 63)



## • Volume

## Power Up

## facts

Power Up 73

jump  
start

-  Count up by halves from 5 to 10.  
Count up by fourths from 2 to 4.

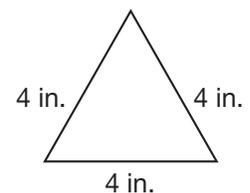
-  Write two multiplication facts using the numbers 9, 7, and 63.

-  Write these money amounts in order from least to greatest.

\$10.50    \$10.95    \$10.05    \$11.50

mental  
math

- a. **Number Sense:**  $38 + 8$   
b. **Number Sense:**  $3000 + 100 + 50 + 8$   
c. **Measurement:** What is the perimeter of the triangle?  
d. **Geometry:** What type of triangle is shown in problem c?

problem  
solving

Denair wrote an addition problem and then erased some of the digits. Find the missing digits in the problem.

$$\begin{array}{r} \_ 2 \\ + 1 \_ \\ \hline 27 \end{array}$$

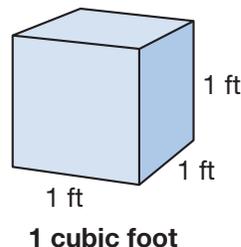
## New Concept



Visit [www.SaxonMath.com/Int3Activities](http://www.SaxonMath.com/Int3Activities) for a calculator activity.

One way to describe the size of a box is to say how much space there is inside the box. If we fill up the box with cubes we can describe the space inside the box in **cubic units**. Instead of saying how many raisins or apples or oranges a box can hold, we might say how many cubic inches it can hold. We might describe the size of a boxcar by saying how many cubic feet or cubic yards it can hold.

The amount of space an object occupies is called its **volume**. A cube with edges one inch long has a volume of one cubic inch.



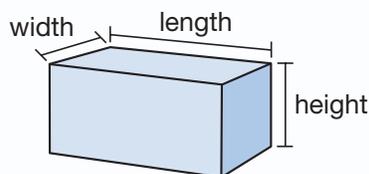
The activity below will help us understand volume. We will find the number of one-inch cubes needed to fill a box.

## Activity

### Volume

Materials: **Lesson Activity 28**, empty boxes such as shoe boxes or tissue boxes, rulers, one-inch cubes

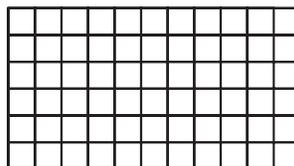
For this activity, you will work together in small groups. Use your ruler to measure the length, width, and height of your box.



Record the length, width, and height in the table on **Lesson Activity 28**. Write the number of inches without a fraction. For example, if the length is  $11\frac{3}{4}$  inches, just write 11 inches.

Dimensions of Box	
length	_____ in.
width	_____ in.
height	_____ in.

Next, figure out how many cubes are needed to make one layer on the bottom of the box. If you do not have enough cubes to cover the bottom of the box, you might need to multiply to find the number.



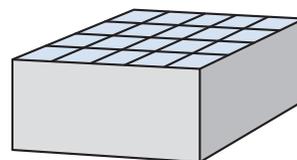
Record the number of cubes that will fit on the bottom of the box. This is the bottom layer. Then figure out how many layers the box could hold without going over the top. Finally, figure out the total number of cubes the box will hold. This is the approximate volume of the box in cubic inches.

Number of Cubes in Box	
number of cubes in bottom layer	_____
number of layers	_____
total number of cubes in box	_____

Write the approximate volume of the box as a number of cubic inches.

### Example

Millie filled a small gift box with 1-inch cubes. The picture shows the top layer. There are two layers of cubes. How many cubes are in the box? What is the volume of the box in cubic inches?



We see the top layer. There are 4 rows of cubes and 5 cubes in each row.

$$4 \times 5 = 20$$

There are 20 cubes in the top layer. Since there are 2 layers, there are **40 cubes in the box.**

$$20 + 20 = 40$$

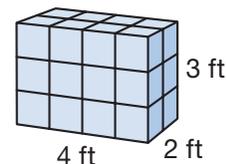
The volume of the box is **40 cubic inches.**

**Discuss** Could you find the volume of Millie's box in cubic feet? Why or why not?

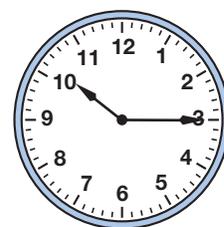
### Lesson Practice

Jorge stores work supplies in 1-foot cubic boxes in his garage.

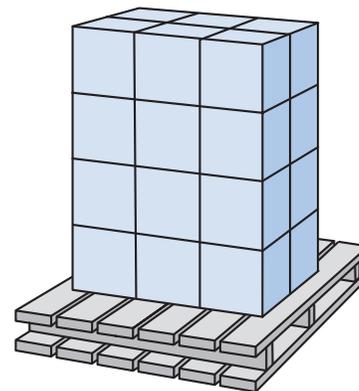
- What is the volume of each box?
- What is the volume of this stack of boxes?



- <sup>(36)</sup> A round-trip ticket to Topeka cost \$149. Cory has \$98. How much more money does he need to buy a ticket?
- <sup>(40)</sup> **Analyze** In a common year, June 30 is the 181st day of the year. How many days are there in the last six months of the year?
- <sup>(60, 64)</sup> The railroad tie cutters worked 9 hours a day, 6 days a week. How many hours did the tie cutters work in a week?
- <sup>(39)</sup> The ride to Pawtucket lasts an hour and a half. The train left the station at 8:45 a.m. The clock showed the time it arrived in Pawtucket. Write the time in digital form.



- <sup>(72)</sup> A pallet is loaded with boxes, as shown.
  - How many boxes are in each layer?
  - How many layers are there?
  - How many boxes are there?
- <sup>(73)</sup> If each box in problem 5 is one cubic foot, then what is the volume of the stack of boxes?



- <sup>(70)</sup> Find each product:
 

<b>a.</b> $3 \times 6$	<b>b.</b> $3 \times 8$	<b>c.</b> $3 \times 7$
------------------------	------------------------	------------------------
- <sup>(64)</sup> Find each product:
 

<b>a.</b> $5 \times 9$	<b>b.</b> $9 \times 2$	<b>c.</b> $9 \times 9$
------------------------	------------------------	------------------------
- <sup>(54)</sup> Change this addition into multiplication and find the total:  

$$\$5 + \$5 + \$5 + \$5 + \$5 + \$5$$

- <sup>(71)</sup> **Represent** Draw a cube.
- <sup>(71)</sup> A cube has how many vertices?

12. Which letter does not show a line of symmetry?

(Inv. 7)



13. **Connect** Find the next three numbers in this sequence:

(2)

14, 21, 28, 35, \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_, ...

14. Find each product:

(61, 70)

a.  $6 \times 7$

b.  $7 \times 7$

c.  $8 \times 7$

Add or subtract, as shown:

15.  $\$800 - \$724$

(28)

16.  $\$6.49 + \$5.52$

(22)

17.  $9 + 9 + 9 + 9 + 9 + 9 + 9 + 9 + 9$

(10, 54)

18. Use words to write each fraction or mixed number.

(41, 46)

a.  $\frac{3}{7}$

b.  $3\frac{1}{2}$

c.  $\frac{9}{10}$

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

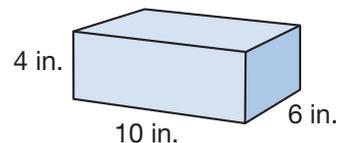
19. A drawing of a box is shown at right.

(71)

a. What is the length of the box?

b. What is the width of the box?

c. What is the height of the box?



20. What is the area of the top of the box in problem 19?

(62)

### Early Finishers

Real-World Connection

Mr. Crosby's mini van weighs 2,746 pounds. When he drives his daughter and four of her friends to softball practice the car weighs 3,273 pounds with the weight of the passengers. How much do the passengers of the car weigh altogether? Write 2,746 and 3,273 using words.

# • Weight: Ounces, Pounds, and Tons

## Power Up

### facts

Power Up 74

### jump start

 Count down by 4s from 40 to 0.  
Count down by 8s from 80 to 0.



Draw an array to show the multiplication fact  $4 \times 2$ .

 Label the number line by 25s from 0 to 250.

### mental math

- Number Sense:**  $900 + 400 + 300$
- Measurement:** How many inches are in 5 feet?
- Money:**  $\$5.75 + \$1.00$
- Patterns:** What number is missing in the pattern below?

1	4	9	—	25	36
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### problem solving

Jim, Ron, and George were standing in line. There were 38 people in front of them and 3 people behind them. Altogether, how many people were standing in line?

## New Concept

The **weight** of an object is a measure of how heavy it is.

Weight can be measured in ounces. A metal spoon weighs about one **ounce**.

Weight can also be measured in pounds. A playground ball might weigh about a **pound**. A pound is equal to 16 ounces.

Very heavy objects can be measured in tons. A small car weighs a **ton**. A ton is equal to 2,000 pounds.

Metal spoon



1 ounce

Playground ball



1 pound

Small automobile



1 ton

### Units of Weight

1 pound = 16 ounces

1 ton = 2,000 pounds

**Verify** A 1-pound box of cereal costs the same as three 4-ounce boxes. Which is the better buy?

### Example 1

Which of these objects would weigh about a pound?

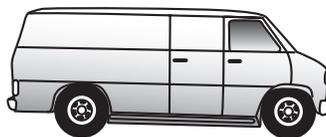
**A** Fork



**B** Shoe



**C** Van



Choice **B**, a shoe, weighs about a pound. A fork weighs about an ounce. A small van might weigh two tons.

### Example 2

If a large car weighs about two tons, then it weighs about how many pounds?

A ton is 2,000 pounds. We can add to find the number of pounds in two tons.

$$2,000 \text{ pounds} + 2,000 \text{ pounds} = 4,000 \text{ pounds}$$

A car that weighs about two tons weighs **about 4,000 pounds**.

## Activity

### Weighing Objects

Use a scale to weigh various objects in the classroom. Make a table like the one below to record the name of each object and its weight. Can you find an object that weighs one ounce? Can you find an object that weighs one pound?

Weights of Objects

Name of Object	Weight

### Lesson Practice

- a. Would you describe the weight of a large dog in ounces, pounds, or tons?
- b. **Multiple Choice** Which object weighs about an ounce?

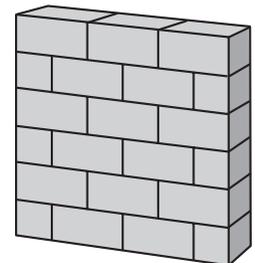
A Birthday card



B Box of cereal



C Brick wall

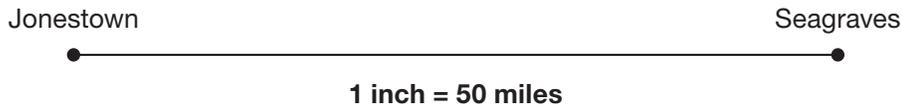


- c. The kitten weighed about two pounds. About how many ounces did the kitten weigh?
- d. **Multiple Choice** The horse weighed about one half of a ton. About how many pounds did the horse weigh?
- A 500 pounds                      B 1,000 pounds  
C 1,500 pounds                    D 2,000 pounds

1. Jefferson sat by the window and watched the train go by.  
 (18) He counted thirty-eight coal cars and twenty-seven boxcars.  
 Altogether, how many coal cars and boxcars did he count?

2. **Formulate** The miners loaded 16 tons of ore in the morning.  
 (36) Their goal was 28 tons by nightfall. How many more tons of  
 coal did they need to load to reach their goal? Write a number  
 sentence

3. Automobiles were shipped west from Jonestown to Seagraves.  
 (Inv. 4) Use the scale to find the approximate distance from Jonestown to  
 Seagraves.



4. It is noon in Detroit. Write the time in digital form.  
 (3)

5. Are the stripes on a United States flag parallel or perpendicular?  
 (Inv. 4)

6. The work crew was paid \$16,000 for laying a mile of track on flat  
 (32) land. Use words to name \$16,000.

7. How many ounces are equal to one pound?  
 (74)

8. The tunnel was four tenths of a mile long. Write four tenths as a  
 (41) fraction.

9. The first rail line connecting the east coast of the United States  
 (39) to the west coast was completed in 1869. How many years ago  
 was that?

10. Find each product.  
 (59)

a.  $6 \times 2$

b.  $8 \times 5$

c.  $5 \times 6$



• Geometric Solids

Power Up

**facts**

Power Up 75

**jump start**

- 123 Count up by 6s from 0 to 60.  
Count up by 12s from 0 to 120.



Write “five and two fifths” using digits.

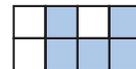


Use the clues below to find the secret number. Write the secret number on your worksheet.

- two-digit number
- perfect square
- sum of the digits is 7
- odd number

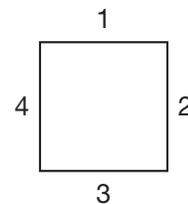
**mental math**

- a. **Estimation:** Round 466 to the nearest hundred.
- b. **Number Sense:**  $44 + 11$
- c. **Money:**  $\$1.60 - \$0.80$
- d. **Fractions:** What fraction of the rectangle is *not* shaded?

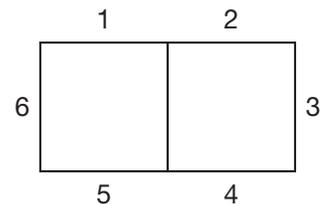


**problem solving**

Four students can sit at a square table (one student on each side). If two tables are joined together, six students can sit. (Notice that nobody can sit at the edges where the tables touch.)



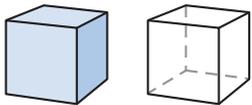
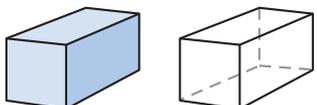
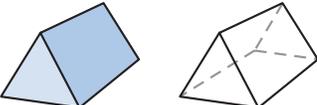
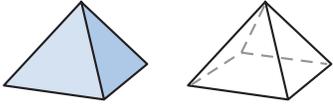
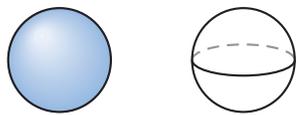
Predict how many students can sit at four tables that are joined into one big square. To check your prediction, draw a diagram of the tables and place numbers where students can sit along the edges.



## New Concept

Geometric shapes that take up space are sometimes called **solids**. Cubes and other rectangular prisms are examples of **geometric solids**. The chart below shows some more geometric solids.

Geometric Solids

Shape	Name
	Cube
	Rectangular prism
	Triangular prism
	Pyramid
	Cylinder
	Cone
	Sphere

**Classify** Are rectangles, triangles, and circles solids? Why or why not?

### Example 1

Which of these figures does *not* represent a solid?

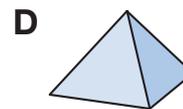
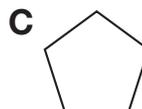
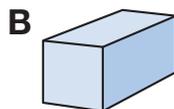


Figure **C**, the pentagon, is a flat shape. It is not a solid.

The world around us is filled with objects that are shaped like solids and combinations of solids. In example 2 we show some common objects that are shaped like solids.

### Example 2

Which object best represents a cylinder?

A



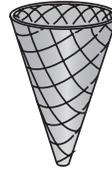
B



C



D



The object shaped most like a cylinder is choice **B**.

### Activity

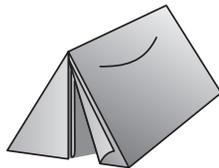
#### Solids

Find pictures in magazines or draw pictures of objects that are the shapes of the solids described in this lesson. Display the pictures on a classroom poster along with the names of the solid shapes.

### Lesson Practice

Write the geometric name for the shape of each figure below.

a.



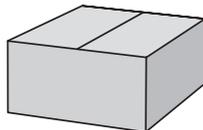
b.



c.



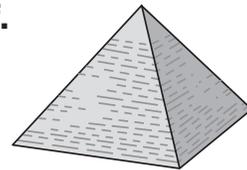
d.



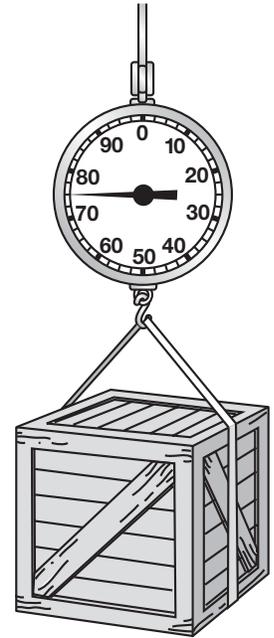
e.



f.



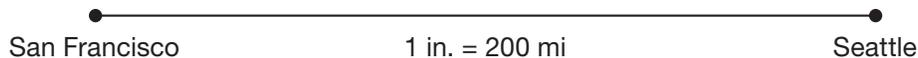
1. **Analyze** Bill wants to load a crate so it weighs 100 pounds. He placed the crate on a scale as shown at right. How many more pounds can he put into the crate?



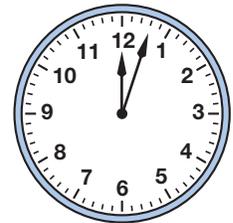
2. Hector bought two matinee tickets to a movie. Each ticket cost \$7.75. What was the total cost of both tickets?

3. **Formulate** The train has seven boxcars. Each boxcar has eight wheels. How many wheels are there on all seven boxcars? Write a number sentence. Then write your answer in a complete sentence.

4. Vegetables were sent north from San Francisco, California, to Seattle, Washington. Find the approximate distance from San Francisco to Seattle.



5. The clock shows the time the train arrived in Seattle Friday afternoon. Write the time in digital form.



6. **Model** Draw pictures to show  $1\frac{1}{4}$  and  $1\frac{3}{8}$ . Then compare the two mixed numbers using a comparison symbol.

7. Find each product.

(64) a.  $9 \times 5$

b.  $7 \times 9$

c.  $2 \times 9$

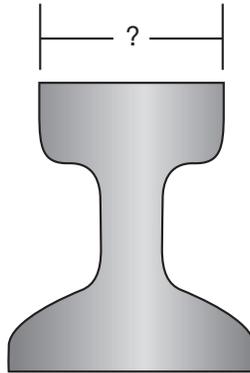
8. Find each product.

(56) a.  $5 \times 0$

b.  $9 \times 1$

c.  $10 \times 8$

9. **Model** The drawing shows the top part of an old train rail. Use your ruler to find the distance across the top of the rail.



10. Teresa bought a pencil for 22¢ and paid for it with a dollar bill. What coins should she get back in change?

11. How many pounds is  
a. two tons?

b. four tons?

12. Find each product.  
a.  $6 \times 3$

b.  $7 \times 6$

c.  $8 \times 7$

13.  $\$472 - \$396$

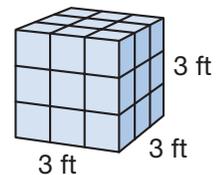
14.  $\$354 + \$263 + \$50$

15.  $5 + 5 + 5 + 5 + 5 + 5 + 5 + 5 + 5 + 5$

16. Find the missing addend:  $36 = 12 + a + 16$

17. Wilson put 1-cubic-foot boxes into stacks like the one shown at right.

- a. How many boxes are in a stack?  
b. What is the volume of a stack?

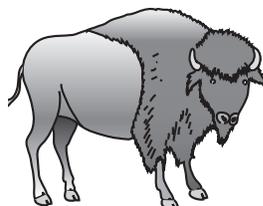


18. For a–c, describe the weight of each animal as about an ounce, a pound, or a ton.

a. crow

b. bison

c. mouse



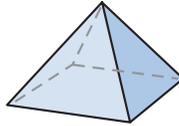
19. Name each solid in a–c.

(75)

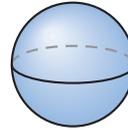
a.



b.

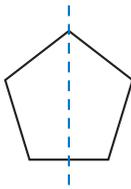


c.

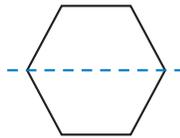


20. **Multiple Choice** Which figure below does *not* show a line of symmetry?  
(Inv. 7)

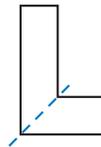
A



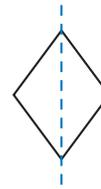
B



C



D



**Early Finishers**

Real-World Connection

Jerry and Phil took a math test on Wednesday. They scored 178 points altogether. Jerry scored ten points higher than Phil. What is each student's score?

# • Multiplication Facts: 11s and 12s

## Power Up

### facts

Power Up 76

### jump start

- 1** **2** **3** Count up by 11s from 0 to 110.  
Count up by square numbers from 1 to 144.



Write these numbers in order from least to greatest.

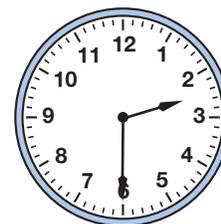
1,025      12,050      12,500      1,250



Draw a square. Divide the square into 4 parts. Shade  $\frac{3}{4}$  of the square. How much of the square is not shaded?

### mental math

- a. **Number Sense:**  $18 \times 10$   
b. **Number Sense:**  $10 + 19 + 6$   
c. **Time:** It is afternoon. Stella's birthday party began at the time shown on the clock. It ended 2 hours later. What time did the party end?

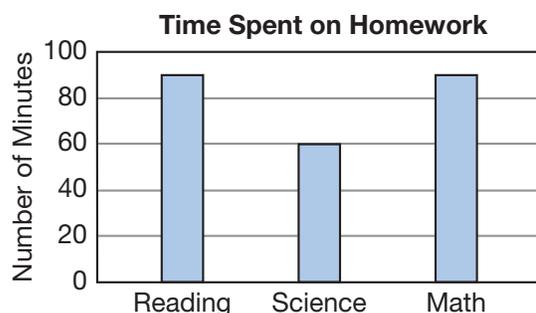


- d. **Calendar:** How many days are in 6 weeks?

### problem solving

This graph shows the amount of time Layne spent on his homework last week.

Altogether, how many hours did Layne spend on his reading and math homework last week?



## New Concept

Since Lesson 56 we have been learning and practicing multiplication facts. In this lesson we will practice the remaining facts through  $12 \times 12$ .

	0	1	2	3	4	5	6	7	8	9	10	11	12
0	0	0	0	0	0	0	0	0	0	0	0	0	0
1	0	1	2	3	4	5	6	7	8	9	10	11	12
2	0	2	4	6	8	10	12	14	16	18	20	22	24
3	0	3	6	9	12	15	18	21	24	27	30	33	36
4	0	4	8	12	16	20	24	28	32	36	40	44	48
5	0	5	10	15	20	25	30	35	40	45	50	55	60
6	0	6	12	18	24	30	36	42	48	54	60	66	72
7	0	7	14	21	28	35	42	49	56	63	70	77	84
8	0	8	16	24	32	40	48	56	64	72	80	88	96
9	0	9	18	27	36	45	54	63	72	81	90	99	108
10	0	10	20	30	40	50	60	70	80	90	100	110	120
11	0	11	22	33	44	55	66	77	88	99	110	121	132
12	0	12	24	36	48	60	72	84	96	108	120	132	144

On the multiplication table, look down the 11s column and notice a pattern.

**Analyze** Describe the pattern you see.

**Conclude** Which 11s facts do you need to practice so that you can remember them?

Look down the 12s column. What patterns can you find?

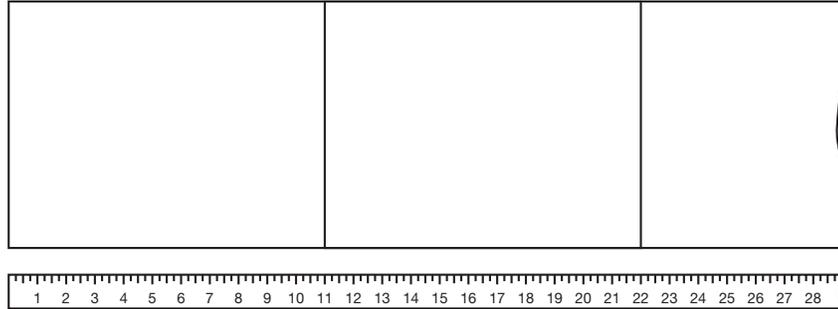
### Activity

#### Modeling 11s and 12s

We can model multiplying by 11 using  $8\frac{1}{2}$ -by-11-inch sheets of paper. On the floor or any other large surface, extend a tape measure to 66 inches.

Starting at the 0 mark, place a sheet of paper lengthwise along the tape measure. Make sure that the paper is lined up with the 0 tick mark and the 11 tick mark on the tape measure.

Continue placing sheets of paper end to end along the tape measure until you reach 66 inches. Name the total length in inches as you put each sheet of paper in place.



How many sheets of paper did you use?

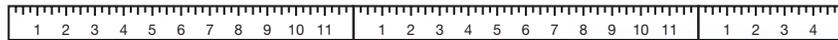
Make a table showing the numbers of pages and inches for each page you placed.

Recall from Lesson 60 that multiplying the number of groups times the number in each group gives us the total.

$$\text{number of groups} \times \text{number in each group} = \text{total}$$

So 6 sheets  $\times$  11 inches for each sheet = 66 inches.

We can model multiplying by 12 using 1-foot rulers. Extend a tape measure to 72 inches. Arrange the rulers end to end along the tape measure. Name the total length in inches as you put each ruler in place.



How many rulers did you use?

$$6 \text{ rulers} \times 12 \text{ inches for each ruler} = 72 \text{ inches}$$

**Formulate** Write a multiplication fact to represent each ruler you placed.

### Example 1

Milton measured the total length of sheets of copy paper placed end to end. Each sheet of paper was 11 inches long. He recorded the results in a table. Make a table to show the total length of one through 12 sheets of paper.

We set up the table to show the number of sheets and the length in inches. We start with one sheet of paper with a length of 11 inches. We add 11 inches for each sheet of paper added to the row.

<b>Number of Sheets</b>	1	2	3	4	5	6	7	8	9	10	11	12
<b>Length in Inches</b>	11	22	33	44	55	66	77	88	99	110	121	132

### Example 2

Use a multiplication table to find each product.

a.  $3 \times 12$                       b.  $6 \times 12$                       c.  $12 \times 12$

a.  $3 \times 12 = 36$

b.  $6 \times 12 = 72$

c.  $12 \times 12 = 144$

### Lesson Practice

Find each product.

a.  $11 \times 11$                       b.  $11 \times 12$                       c.  $12 \times 5$

d.  $12 \times 6$                       e.  $7 \times 12$                       f.  $8 \times 12$

g.  $9 \times 12$                       h.  $12 \times 10$                       i.  $12 \times 12$

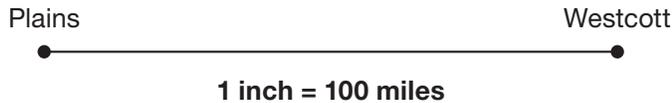
- j. The word “dozen” means 12. John raises chickens and puts the eggs in cartons. Each carton contains a dozen eggs. Make a table to show the number of eggs in one through 12 cartons. How many eggs are in 9 cartons? How many eggs are in 12 cartons?

### Written Practice

*Distributed and Integrated*

- <sup>(34, 60)</sup> Jeff walked along the length of a rail. He took nine big steps. Each big step was about 3 feet long. The rail was about how many feet long?
- <sup>(39)</sup> The California Gold Rush was in 1849. The first railroad across the country was complete in 1869. How many years were there from 1849 to 1869?

3. Fruit was shipped from Plains to Westcott . Find the approximate distance from Plains to Westcott.  
(Inv. 4)



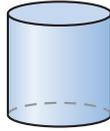
4. Name each shape below.

(75)

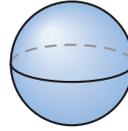
a.



b.



c.



5. Find each product:

(64)

a.  $9 \times 6$

b.  $4 \times 9$

c.  $9 \times 9$

6. This picture is an old Santa Fe Railroad logo. Are the two dark stripes inside the circle parallel or perpendicular?  
(Inv. 4)



7. The work crew was paid \$48,000 for laying a mile of track in the mountains. Use words to name \$48,000.  
(32)

8. Change this addition to multiplication and find the total.  
(54, 76)

$$12 + 12 + 12 + 12 + 12 + 12$$

9. How many pounds are equal to

(74)

a. three tons?

b. four tons?

10. The bridge is three tenths of a mile wide. Write three tenths as a fraction.  
(41)

11. Find each product:

(70)

a.  $8 \times 7$

b.  $4 \times 6$

c.  $6 \times 7$

12.  $85\text{¢} + 76\text{¢} + \$10$

(22, 24)

13.  $\$5.00 - \$3.29$

(26, 28)

14. The hallway was 12 feet wide. How many inches are equal to 12 feet?  
(60, 76)

15. Find each product:

(61, 76)

a.  $11 \times 11$

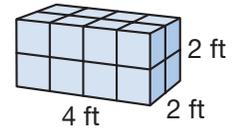
b.  $11 \times 12$

c.  $9 \times 12$

16. Boxes are stacked on the shelf as shown at right.

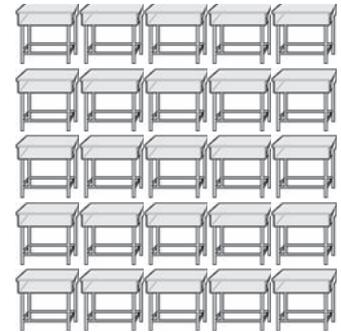
(72, 73)

- How many boxes are in the stack?
- What is the volume of the stack?



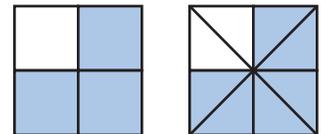
17. **Formulate** The rows of desks in the classroom formed an array. Write a multiplication fact for this array, which is shown at right.

(57)



18. Write the two fractions represented by the shaded squares. Then compare the two fractions.

(41, 47)



19. **Model** On this map, how many inches is it from

(35)

- Granville to Lexington?
- Lexington to Hampshire?
- Granville to Hampshire through Lexington?



20. If each  $\frac{1}{4}$  inch on the map in problem 19 represents 10 miles, how many miles is it from Lexington to Hampshire?

(Inv. 4)

**Early Finishers**

Real-World Connection

Mrs. Lee is sorting items by their shapes. She made a pile for items that are shaped like cylinders. She made a second pile for items that are shaped like rectangular solids. She made a third pile for items that are shaped like spheres. Make a list of items Mrs. Lee can put in each pile.

# • Multiplying Three Numbers

## Power Up

### facts

Power Up 77

### jump start

 Count up by 7s from 0 to 77.  
Count up by 12s from 0 to 120.

 There are 5,280 feet in one mile. Write this number using words.

 Write two multiplication facts using the numbers 6, 8, and 48.

### mental math

a. **Money:** \$10.00 – \$6.75

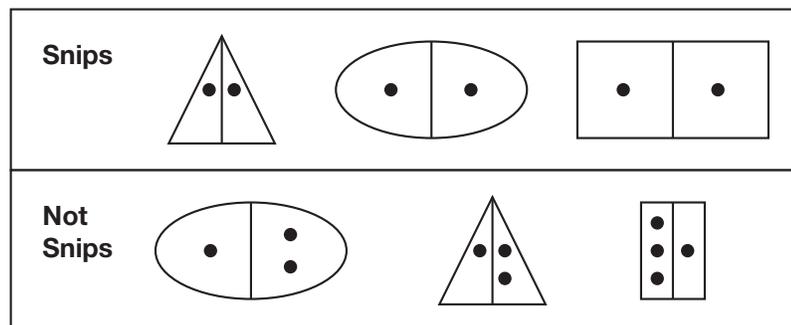
b. **Number Sense:**  $170 + 20$

c. **Number Sense:**  $20 \times 10$

d. **Time:** It is 7:35 a.m. How many minutes is it until 8:00 a.m.?

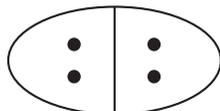
### problem solving

Here we show examples of figures with a special made-up name, Snips. We also show nonexamples (figures that are not examples) of Snips. Study the examples and nonexamples.



Which of these figures is a Snip? Explain your answer.

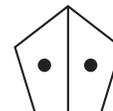
A



B



C



## New Concept

In Lesson 10 we learned how to add three numbers. In this lesson we will learn how to multiply three numbers.

To find the product of  $2 \times 3 \times 4$ , we begin by multiplying two factors. We multiply  $2 \times 3$ . The product is 6.

$$\begin{array}{c} 2 \times 3 \times 4 \\ \vee \\ 6 \times 4 \end{array}$$

Next we multiply 6 by the remaining factor, 4.

$$6 \times 4 = 24$$

The product is **24**.

### Example

**Multiply:**  $4 \times 2 \times 7$

First we multiply  $4 \times 2$  to get 8. Then we multiply  $8 \times 7$  to find the product of all three factors:  $8 \times 7 = 56$ .

### Activity

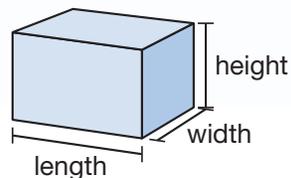
#### *Multiplying to Find Volume*

Materials: 1-inch cubes

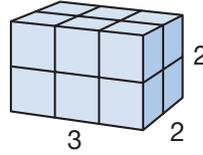
In the activity in Lesson 73, we found the volume of a box by counting the total number of cubes the box would hold.

In this activity, we will use multiplication to find volume.

First, we will use cubes to build a rectangular prism. A rectangular prism has length, width, and height.



Build a rectangular prism that is 3 units long, 2 units wide, and 2 units high, as shown below.



Count the number of cubes you used to build the rectangular prism. How many cubes are there in all?

What is the volume of the rectangular prism?

What is the length, width, and height of the rectangular prism?

What is the product when you multiply  $3 \times 2 \times 2$ ?

**Discuss** What is the relationship between the length, width, and height of a rectangular prism and its volume?

### Lesson Practice

Find each product in a–d.

a.  $2 \times 2 \times 2$

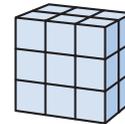
b.  $3 \times 3 \times 4$

c.  $1 \times 2 \times 11$

d.  $6 \times 2 \times 5$

e. What is the length, width, and height of this figure?

f. Find the volume of the figure by multiplying its length, width, and height.



### Written Practice

*Distributed and Integrated*

- <sup>(36)</sup> **Formulate** The boxcar could carry 36 tons of cargo. Fifteen tons of cargo were already in the car. How many tons of additional cargo could the boxcar carry? Write a number sentence. Then write your answer in a complete sentence.
- <sup>(60, 70)</sup> Four round tables were in the room. There were eight chairs around each table. Altogether, how many chairs were there?
- <sup>(71)</sup> a. **Represent** Draw a picture of a cube.
  - A cube has how many faces?
  - A cube has how many vertices?

**4. Represent** Draw a rectangle that is 4 inches long and 1 inch wide.  
(34, 52)

**5. a.** What is the perimeter of the rectangle you drew in problem 4?  
(58, 62)

**b.** What is the area of the rectangle?

**6.** How many pounds are equal to  
(74)

**a.** one ton?

**b.** two tons?

**c.** three tons?

**7.** Draw a picture to show the fraction  $\frac{3}{7}$ .  
(42)

**8.** A large horse weighs about half of a ton. A half ton is equal to  
(74) how many pounds?

**9.** The train was eight tenths of a mile long. Write eight tenths as a  
(41) fraction.

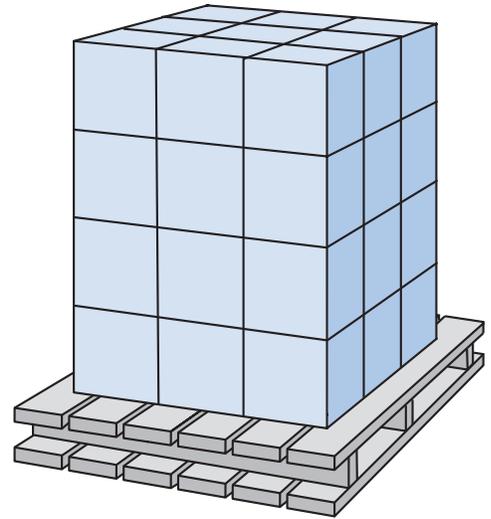
**10.** Boxes were stacked on a pallet. Each box  
(72, 73) was one cubic foot.

**a.** How many layers of boxes were there in the stack?

**b.** How many boxes were in each layer?

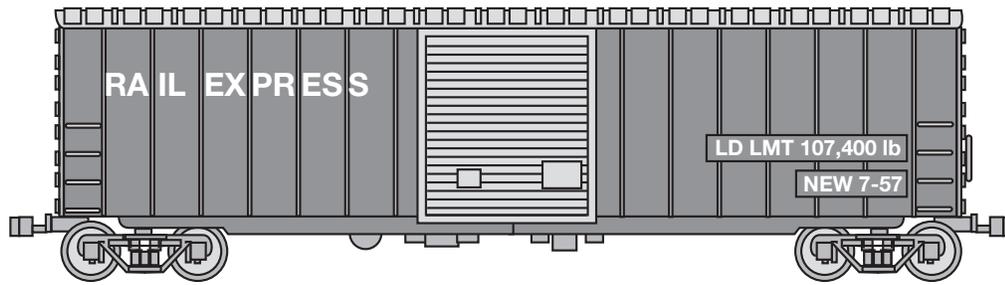
**c.** How many boxes were there in the stack?

**d.** What is the volume of the stack of boxes?



**11.** Draw an obtuse angle.  
(65)

Judy saw these numbers on a boxcar. Refer to this illustration to answer problems **12** and **13**.



**12.** The “load limit” of this boxcar is 107,400 pounds. Use words to name this number.  
(32)

**13.** On the boxcar, Judy saw NEW 7-57. This shows the month and year the boxcar was built. Name the month and full year this boxcar was built.  
(1)

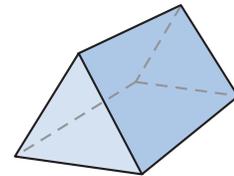
**14.**  $\$648 + \$286$   
(16)

**15.**  $\$7.50 - \$7.29$   
(26)

**16.**  $2 \times 3 \times 4$   
(77)

**17. a.** Name the shape shown.  
(75)

- b.** How many triangular faces does it have?
- c.** How many rectangular faces does it have?
- d.** How many faces does it have in all?



**18.** Find each product:  
(76)

**a.**  $8 \times 12$

**b.**  $9 \times 12$

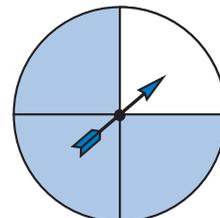
**c.**  $11 \times 12$

**19. Multiple Choice** Which pair of triangles are congruent?  
(68, 69)



**20. a.** What fraction of the face of the spinner is blue?  
(41, 45)

- b.** If the spinner is spun once, is the arrow more likely to stop on blue or white?



# • Multiplying Multiples of Ten

## Power Up

### facts

Power Up 78

### jump start

 Count down by 3s from 45 to 0.  
Count down by 6s from 60 to 0.

 It is 2:20 in the afternoon. Draw hands on your clock to show the time in 2 hours. Write the time in digital form.

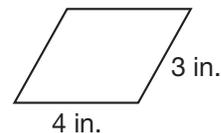
 The high temperature on the first of the month was 48°F. The high temperature on the last day of the month was 7 degrees warmer. Mark your thermometer to show the high temperature at the end of the month.

### mental math

- a. **Time:** How many years are in 8 decades?
- b. **Number Sense:**  $10 + 18 + 5$
- c. **Money:** Compare these money amounts using the symbol  $<$   $>$  or  $=$ .

5 quarters  12 dimes

- d. **Measurement:** What is the perimeter of the parallelogram?



### problem solving

Megan inserted 4 coins into the vending machine to purchase a snack bar that cost 65¢. The machine returned 1 nickel in change. What coins did Megan use in the vending machine?

## New Concept

The **multiples of ten** are the numbers that we say when we count by tens.

10, 20, 30, 40, 50, ...

Each multiple of ten can be written as a number times 10.

$$20 = 2 \times 10$$

$$30 = 3 \times 10$$

$$40 = 4 \times 10$$

One way to multiply multiples of ten is to multiply three factors. Below we multiply  $4 \times 30$  by writing 30 as  $3 \times 10$ .

$$4 \times 30$$

^

$$4 \times 3 \times 10$$

Next we multiply  $4 \times 3$ , which is 12. Then we multiply  $12 \times 10$ .

$$4 \times 3 \times 10$$

v

$$12 \times 10 = 120$$

A shortcut is to multiply the digit in the tens place and then attach a zero to the product. For  $4 \times 30$ , we multiply  $4 \times 3 = 12$ . Then we add a zero to the 12 to make 120.

$$\textcircled{4} \times \textcircled{30} = 120$$

### Example 1

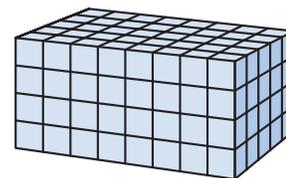
**Diana has seven \$20 bills. How much money is that?**

Instead of adding seven 20s, we can multiply \$20 by 7. We know that  $7 \times 2$  is 14, so  $7 \times \$20$  is **\$140**.

### Example 2

**There are 40 cubes in each layer of this figure. How many cubes are there in all 4 layers?**

Instead of adding four 40s, we multiply 40 by 4. Since  $4 \times 4$  is 16, we know that  $4 \times 40$  is 160. The figure contains **160 cubes**.





8. Find each product:

(59, 64)

a.  $7 \times 0$

b.  $7 \times 5$

c.  $7 \times 9$

9. Ten miles is 52,800 feet. Use words to write 52,800.

(32)

10. Find each product:

(76)

a.  $5 \times 12$

b.  $6 \times 12$

c.  $7 \times 12$

11. Find each product:

(64, 70)

a.  $6 \times 7$

b.  $6 \times 8$

c.  $6 \times 9$

12. Find each product:

(78)

a.  $3 \times 20$

b.  $6 \times 30$

c.  $4 \times 40$

13.  $\$676 + \$234$

(16)

14.  $\$1.00 - 73\text{¢}$

(26, 28)

15.  $3 \times 3 \times 3$

(77)

16.  $7 \times 50$

(78)

17. **Multiple Choice** A full-grown cat could weigh

(74)

A 8 ounces.

B 8 pounds.

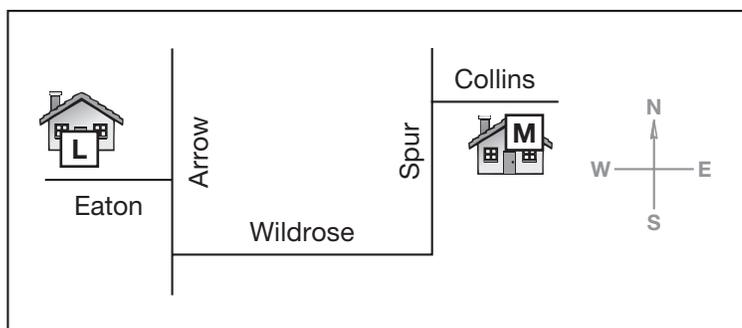
C 8 tons.

18. a. **Connect** How many ounces equal a pound?

(41, 74)

b. An ounce is what fraction of a pound?

This map shows where Leslie and Monica live. Use this map to answer problems 19 and 20.



19. Name two roads perpendicular to Wildrose.

(Inv. 4)

20. Write directions that describe how to get to Monica's home from

(31)

Leslie's home.

# • Length: Centimeters, Meters, and Kilometers

## Power Up

### facts

Power Up 79

### jump start

-  Count down by 4s from 40 to 0.  
Count down by 8s from 80 to 0.

 Write the largest 4-digit number that uses each of the digits 3, 2, 6, and 4. What is the value of the digit in the hundreds place?

 Draw an isosceles triangle in the workspace on your worksheet. Then draw a line to show the triangle's line of symmetry.

### mental math

- a. **Measurement:** Which of these units would you use to measure a sheet of paper?

feet      pounds      miles      inches

- b. **Number Sense:**  $26 \times 10$

- c. **Number Sense:**  $12 \times 100$

- d. **Algebra:** The table below shows costs for a long-distance phone call. Find the missing money amount in the table.

<b>Minutes</b>	1	2	3	4	5
<b>Cost</b>	8¢	16¢	24¢	_____	40¢

### problem solving

Alex is half as old as Beyonce. Beyonce is 2 years older than Chandra. Chandra is 10 years old. How old is Alex?

## New Concept

We have measured lengths in inches, feet, yards, and miles. These units are called customary units and are used mostly in the United States.

Nearly every other country uses the **metric system**. Metric units of length include **centimeters, meters, and kilometers**.

A ruler that is 12 inches long is about 30 centimeters long. A meter is 100 centimeters and is a little longer than a yard. A kilometer is 1000 meters and is a little more than half of a mile.

### Metric Units of Length

Unit	Abbreviation	Reference
centimeter	cm	width of a finger
meter	m	one BIG step
kilometer	km	$\frac{6}{10}$ mile
1 meter = 100 centimeters 1 kilometer = 1000 meters		

### Activity

#### Metric Units of Length

Most rulers have an inch scale on one side and a centimeter scale on the other side. Find the centimeter scale on your ruler. Use it to measure some objects at your desk in centimeters.

1. How wide is your paper?
2. How long is your paper?
3. How long is your pencil?
4. How long is this segment?  
\_\_\_\_\_

Work in small groups to measure with a meterstick.

5. About how many meters wide is the classroom door?
6. About how many meters high is the classroom door?

7. About how many meters long is the chalkboard or bulletin board in your classroom?
8. About how many meters long (or wide) is your classroom?

### Example 1

**Multiple Choice** Which length could be the length of a pencil?

- |                         |             |
|-------------------------|-------------|
| A 15 centimeters        | B 15 meters |
| C 15 kilometers         | D 15 feet   |
| <b>A 15 centimeters</b> |             |

### Example 2

The train engine pulled a line of 50 boxcars that was about a kilometer long. How many meters is a kilometer?

A kilometer is **1000 meters**.

### Example 3

A 12-inch ruler is about 30 centimeters. If 3 rulers are laid end to end, about how many centimeters long would the 3 rulers be?

Since each ruler is about 30 cm long, 3 rulers would be  $3 \times 30$  cm, which is about 90 cm long.

$$3 \times 30 \text{ cm} = 90 \text{ cm}$$

**Analyze** Is the length of 3 rulers more or less than a meter?

### Example 4

Find the length and width of this rectangle in centimeters. Then find the perimeter of this rectangle in centimeters and find its area in square centimeters.



Using a centimeter ruler, we find the length and width.

Length **4 cm**

Width **3 cm**

We use these measures to find the perimeter and area.

Perimeter  $4\text{ cm} + 3\text{ cm} + 4\text{ cm} + 3\text{ cm} = \mathbf{14\text{ cm}}$

Area  $4\text{ cm} \times 3\text{ cm} = \mathbf{12\text{ square cm}}$

### Lesson Practice

- Draw a segment 2 inches long. Then measure the segment in centimeters. Two inches equals about how many centimeters?
- How many centimeters long is the cover of your math book?
- A meter is how many centimeters?
- It takes about 10 minutes to walk a kilometer. How many meters is a kilometer?

Refer to the rectangle to answer problems **e–h**.



- How long is the rectangle in centimeters?
- How wide is the rectangle in centimeters?
- How many centimeters is the perimeter of the rectangle?
- How many square centimeters is the area of the rectangle?

### Written Practice

*Distributed and Integrated*

- <sup>(60)</sup> The passenger car had nine rows of seats. Four passengers could sit in each row. How many passengers could sit in the passenger car?
- <sup>(1, 36)</sup> **Analyze** In a common year, March 31 is the ninetieth day of the year. How many days are in the last nine months of the year? (*Hint: Think of how many days are in a whole year.*)

3. The westbound crew laid four miles of track each day for six days.  
(60) How many miles of track did the crew lay in six days?

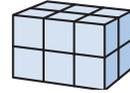
4. a. **Represent** Draw a picture of a cube.  
(71)

b. A cube has how many faces?

c. A cube has how many edges?

d. A cube has how many vertices?

5. Natalie arranged some wooden cubes to make  
(72, 73) the shape at right.



a. How many cubes did she use?

b. If each cube is one cubic inch, what is the volume of the shape?

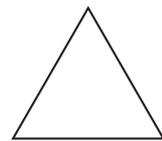
6. **Represent** Use a centimeter ruler to draw a rectangle that is  
(52, 79) 5 cm long and 2 cm wide.

7. a. What is the perimeter of the rectangle you drew in problem 6?  
(58, 62)

b. What is the area of the rectangle?

8. a. **Model** How long, in centimeters, is each side of  
(69, 79) this triangle?

b. What is the name for a triangle with three equal sides?



9. a. **Represent** Draw a triangle congruent to the triangle in  
(69, 79) problem 8.

b. What is the perimeter of the triangle you drew?

10. Find each product.  
(64)

a.  $9 \times 7$

b.  $6 \times 9$

c.  $4 \times 9$

11. Find each product.  
(78)

a.  $2 \times 40$

b.  $3 \times 70$

c.  $4 \times 50$

12. Change this addition into multiplication and find the total.  
(54)

$$7 \text{ days} + 7 \text{ days} + 7 \text{ days} + 7 \text{ days} + 7 \text{ days}$$

13. A giraffe can weigh 4,000 pounds. How many tons is 4,000 pounds?  
(74)

14. Find each product.

(70)

a.  $8 \times 4$

b.  $8 \times 6$

c.  $8 \times 7$

15.  $\$7.60 + \$8.70 + \$3.70$   
(22, 24)

16.  $\$7.50 - \$3.75$   
(26)

17. Find the next four numbers in this sequence:

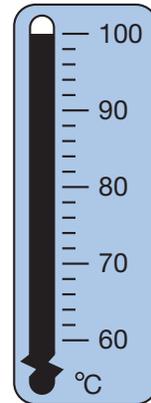
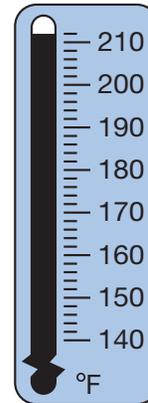
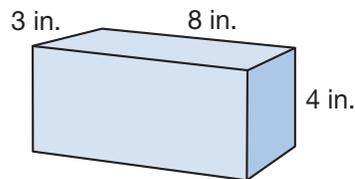
(2, 46)

1,  $1\frac{1}{4}$ ,  $1\frac{1}{2}$ ,  $1\frac{3}{4}$ , 2, \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_, ...

18. The thermometers show the boiling points of water on the Celsius and Fahrenheit scales. Write the temperatures.  
(4)

19. A drawing of a rectangular prism is shown below.

(71)



a. What is its length?

b. What is its width?

c. What is its height?

20. What is the area of the top of the rectangular prism in problem 19?

(62)

**Early Finishers**  
Real-World Connection

Shantell is making bead necklaces for the craft fair. She can make 10 necklaces a day. She has to make 80 total for the craft fair. How many weeks will it take her to make all 80 necklaces if she only works 3 days a week?

# • Mass: Grams and Kilograms

## Power Up

### facts

Power Up 80

### jump start



Count up by 11s from 0 to 110.

Count up by square numbers from 1 to 144.



Use these clues to find the secret number. Write the secret number on your worksheet.

- two-digit number
- between 20 and 40
- product of the digits is 14



Draw a 10-centimeter segment on your worksheet.

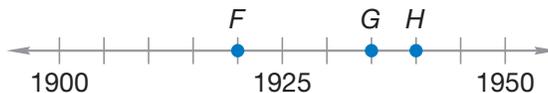
### mental math

a. **Calendar:** How many months are in 3 years?

b. **Number Sense:**  $23 + 40$

c. **Time:** 50 minutes – 15 minutes

d. **Number Line:** What year is shown by point G?



### problem solving

Scott's basketball team will use two-digit numbers on their uniforms. Each player can choose a 1 or a 2 for the first digit. The second digit must be a 0, 1, or 2. What are the possible uniform numbers?

## New Concept

In the U.S. Customary System, ounces, pounds, and tons are units of weight. In the metric system, grams and kilograms are units of mass.

The mass of a dollar bill is about one gram. The mass of a large paper clip is also about one gram. A kilogram is 1,000 grams. The mass of your math textbook is about one kilogram. On Earth a kilogram weighs a little more than 2 pounds.

### Metric Units of Mass

Unit	Abbreviation	Reference
gram	g	dollar bill or large paper clip
kilogram	kg	basketball
1 kilogram = 1,000 grams		

### Activity

#### Metric Units of Mass

Copy the table below, and list two or three objects in each column of the table. Compare with a large paper clip to decide if an object is close to a gram or more than a gram. Compare with a basketball to decide if an object is more or less than a kilogram.

#### Mass of Objects

Close to a gram	More than a gram, less than a kilogram	More than a kilogram

#### Example 1

Which is the best estimate for the mass of a pencil?

**12 grams**

**12 kilograms**

The mass of a pencil is greater than a paper clip but much less than a basketball. So the mass is several grams but much less than a kilogram. The best estimate is **12 grams**.

#### Example 2

The mass of a pair of adult's shoes is about one kilogram. How many grams is a kilogram?



5. Write the fraction of each rectangle that is shaded. Then compare the shaded rectangles.



6. **Multiple Choice** Which of these multiplications does *not* equal 12?

A  $1 \times 12$

B  $2 \times 6$

C  $3 \times 4$

D  $6 \times 6$

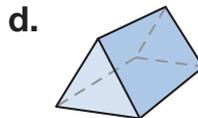
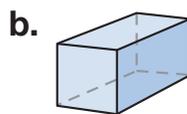
7. What is the total value of four quarters, eight nickels, two dimes, and a penny?

8. An odometer shows the following display:



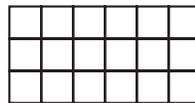
- Write the miles shown.
- Use words to state the number of miles the car has been driven.

9. Name each figure below.



10. **Represent** Draw a picture of a cube. A cube has how many edges?

11. Alberto made this rectangular shape with 1-centimeter square tiles.



- How long is the rectangle?
- How wide is the rectangle?
- How many tiles did he use?
- What is the area of the shape?

- 12.** Change this addition to multiplication and find the total:  
(54, 76)

$$12 \text{ in.} + 12 \text{ in.}$$

- 13.** Find each product:

(70)

**a.**  $8 \times 7$

**b.**  $7 \times 6$

**c.**  $3 \times 7$

- 14.** Find each product:

(78)

**a.**  $4 \times 30$

**b.**  $6 \times 30$

**c.**  $8 \times 30$

- 15.** A meter is 100 cm. A door that is 2 meters tall is how many centimeters tall?  
(79)

**16.**  $\$587 - \$295$   
(23)

**17.**  $\$5.45 + \$3.57$   
(22)

- 18.** What is the best estimate of the mass of a full-grown cat?  
(80)

4 kilograms

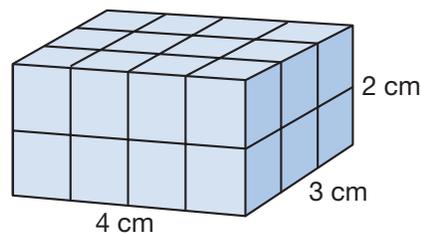
4 grams

- 19.** Which letter does *not* show a line of symmetry?  
(Inv. 7)



- 20. a.** **Formulate** Show how multiplying three numbers helps you find the number of cubes in this stack.  
(72, 77)

- b.** What is the volume of the stack of cubes?

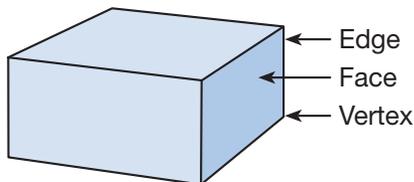


Focus on

• More About Geometric Solids

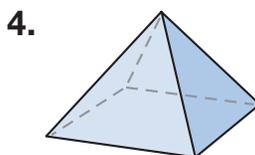
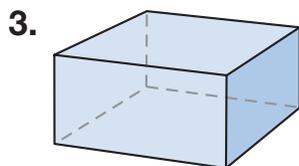
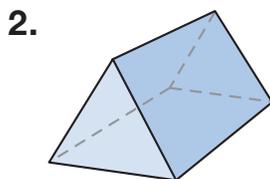
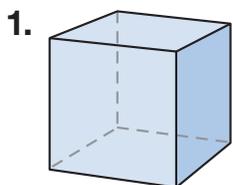
In Lesson 75 we learned the geometric names of several different solids. In this investigation we will practice identifying, classifying, and describing geometric solids.

Recall from Lesson 71 that rectangular prisms have faces, edges, and vertices.

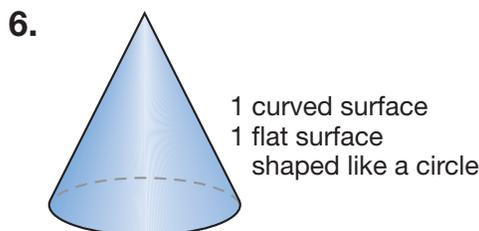
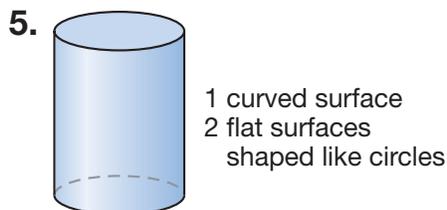


Other geometric solids made of flat surfaces also have faces, edges, and vertices.

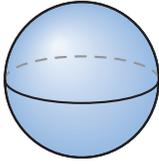
Give the geometric name for each of the solids in problems 1–4. Describe the solid by its number and shape of faces. Then count the numbers of edges and vertices. Use the Relational GeoSolids to help you answer the questions.



Some solids have surfaces that are not flat. Name each solid shown and described in problems 5–7.



7.



1 curved surface

## Activity

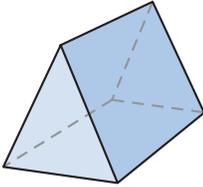
### Classifying Solids

Your teacher will show the class several objects labeled with letters from A–J. For each object, write its geometric name in the correct place on **Lesson Activity 29**. Then explain in your own words how you know that name is correct.

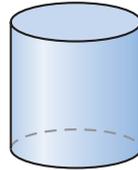
Use what you know about geometric solids and their attributes to answer problems **8–12**. Use your Relational GeoSolids to help answer the questions.

**8. Multiple Choice** Which geometric solid shown below does *not* belong? How do you know?

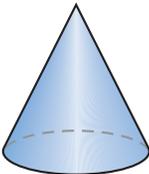
**A**



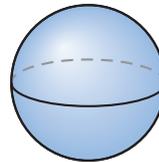
**B**



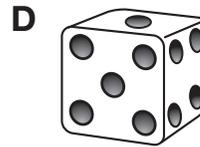
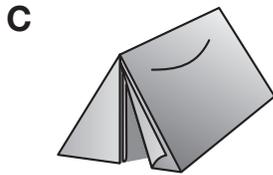
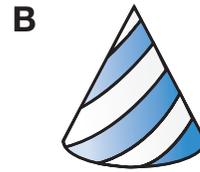
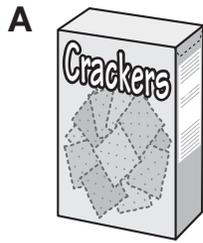
**C**



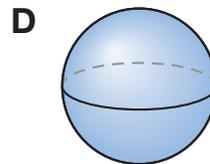
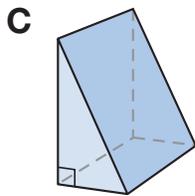
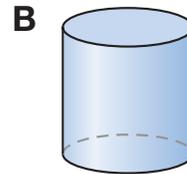
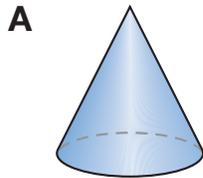
**D**



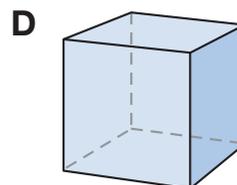
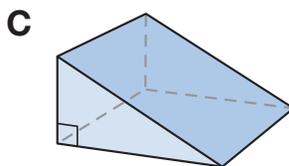
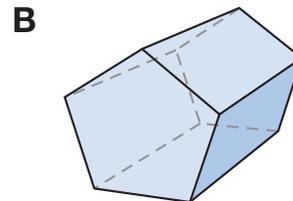
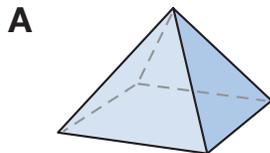
9. **Multiple Choice** Which object best represents a triangular prism?



10. **Multiple Choice** Which geometric solid shown below has two flat surfaces and one curved surface?



11. **Multiple Choice** Which geometric solid shown below has eight vertices?



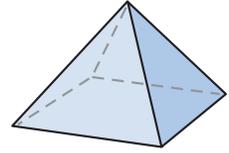
**12. Multiple Choice** What is the geometric name for this solid?

**A** pyramid

**B** rectangular prism

**C** triangular prism

**D** cube



Look around the classroom or around your house to find objects in the shape of each geometric solid we discussed in this investigation. Share the objects with the class, and choose an example of each to display.