

Study Links

Common Core Units 10-12

Everyday Math Grade 4



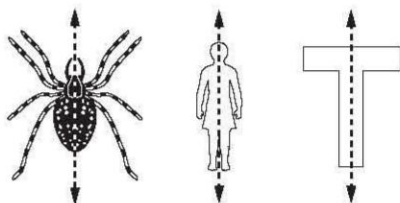
Name: _____

Teacher: _____

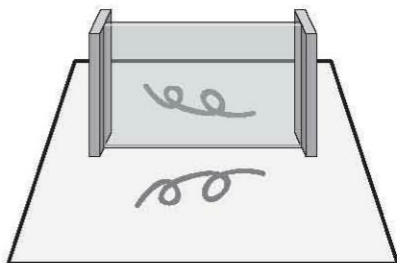


Reflections and Symmetry

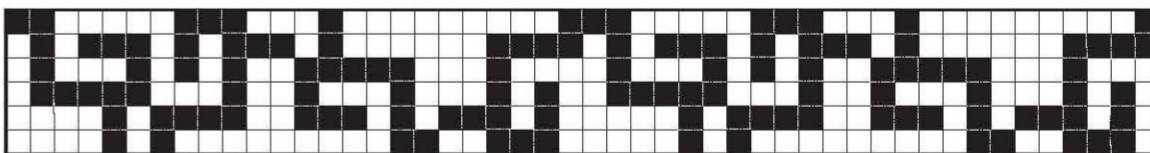
In this unit, your child will take another look at geometry, with an emphasis on symmetry. Many objects in nature are symmetrical: flowers, insects, and the human body, to name just a few. Symmetry is all around—in buildings, furniture, clothing, and paintings.



The class will focus on **reflectional symmetry**, also called **line symmetry** or **mirror symmetry**, in which half of a figure is the mirror image of the other half. Encourage your child to look for symmetrical objects, and if possible, to collect pictures of symmetrical objects from magazines and newspapers. For example, the right half of the printed letter T is the mirror image of the left half. If you have a small hand mirror, have your child check letters, numbers, and other objects to see whether they have line symmetry. The class will use a device called a **transparent mirror**, which is pictured below. Students will use it to see and trace the mirror image of an object.



Geometry is not only the study of figures (such as lines, rectangles, and circles), but also the study of transformations or “motions” of figures. These motions include **reflections** (flips), **rotations** (turns), and **translations** (slides). Your child will use these motions to create pictures like the ones below, called **frieze patterns**.



Students will also work with positive and negative numbers, looking at them as reflections of each other across zero on a number line. They will develop skills of adding positive and negative numbers by thinking in terms of credits and debits for a new company, and they will practice these skills in the *Credits/Debits Game*.

Please keep this Family Letter for reference as your child works through Unit 10.

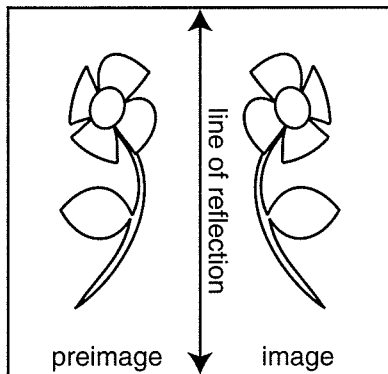
Vocabulary

Important terms in Unit 10:

frieze pattern A geometric design in a long strip in which an element is repeated over and over. The element may be rotated, translated, and reflected. Frieze patterns are often found on the walls of buildings, on the borders of rugs and tiled floors, and on clothing.

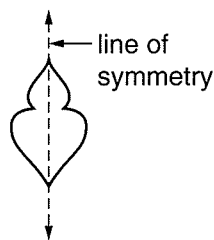


image The reflection of an object that you see when you look in the mirror. Also a figure that is produced by a transformation (reflection, translation, or rotation) of another figure. See *preimage*.



line of reflection A line halfway between a figure (*preimage*) and its reflected image. In a reflection, a figure is “flipped over” the line of reflection.

line of symmetry A line drawn through a figure that divides the figure into two parts that are mirror images of each other. The two parts look alike, but face in opposite directions.

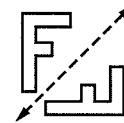


negative number A number that is less than zero; a number to the left of zero on a horizontal

number line or below zero on a vertical number line. The symbol “-” may be used to write a negative number. For example, “negative 5” is usually written as -5 .

preimage A geometric figure that is somehow changed (by a *reflection*, a *rotation*, or a *translation*, for example) to produce another figure. See *image*.

reflection (flip) The “flipping” of a figure over a line (the *line of reflection*) so that its image is the mirror image of the original (*preimage*).



reflection

rotation (turn) A movement of a figure around a fixed point, or axis; a “turn.”



symmetric Having the same size and shape on either side of a line, or looking the same when turned by some amount less than 360° .

transformation Something done to a geometric figure that produces a new figure. The most common transformations are translations (slides), reflections (flips), and rotations (turns).

translation A movement of a figure along a straight line; a “slide.” In a translation, each point of the figure slides the same distance in the same direction.



translation

Do-Anytime Activities

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

1. Have your child look for frieze patterns on buildings, rugs, floors, and clothing. If possible, have your child bring pictures to school or make sketches of friezes that he or she sees.
2. Encourage your child to study the mathematical qualities of the patterns of musical notes and rhythms. Composers of even the simplest of tunes use reflections and translations of notes and chords (groups of notes).
3. Encourage your child to incorporate transformation vocabulary—**symmetric**, **reflected**, **rotated**, and **translated**—into his or her everyday vocabulary.

Building Skills through Games

In this unit, your child will play the following games to develop his or her understanding of addition and subtraction of positive and negative numbers, practice estimating and measuring angles, practice plotting ordered pairs in the first quadrant of a coordinate grid, and identify properties of polygons. For detailed instructions, see the *Student Reference Book*.

Angle Tangle See *Student Reference Book*, page 230. Two players need a protractor, straightedge, and several sheets of blank paper to play this game. This game provides practice estimating and measuring angle sizes.

Credits/Debits Game See *Student Reference Book*, page 238. Playing the *Credits/Debits Game* offers students practice adding and subtracting positive and negative numbers.

Over and Up Squares See *Student Reference Book*, page 257. Two players need a gameboard and record sheet, 2 different-colored pencils, and 2 six-sided dice to play this game. Playing this game provides practice plotting ordered pairs and developing a winning game strategy.

Polygon Pair-Up See *Student Reference Book*, page 258. To play this game, two players need a deck of polygon cards, a deck of property cards, and paper and pencils for sketching. Playing this game provides students with practice identifying properties of polygons.

STUDY LINK
10•1

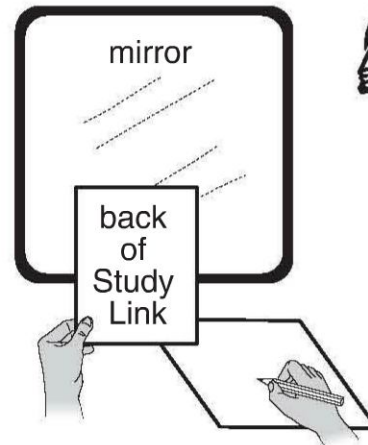
A Reflected Image



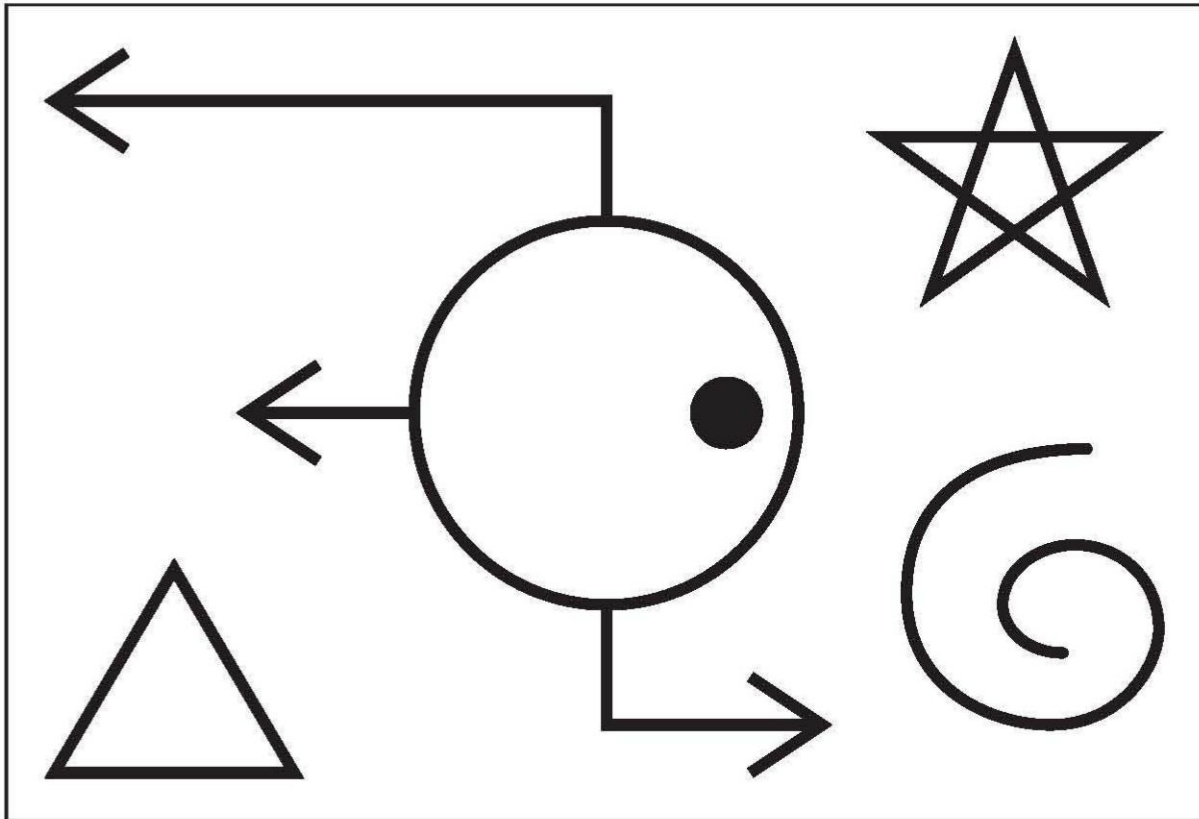
There is a simple design in the box in the middle of this page. It is the **preimage**.

Hold this page in front of a mirror, with the printed side facing the mirror. On a blank piece of paper, sketch what the design looks like in the mirror—the **image**.

Compare your sketch (image) with the design on the Study Link page (preimage). Bring both the preimage and image to school tomorrow.



Sketch the design as it looks in the mirror.


Practice

1. 10% of 130 = _____

2. _____ = 25% of 32

3. _____ = 15% of 120

4. 70% of 490 = _____

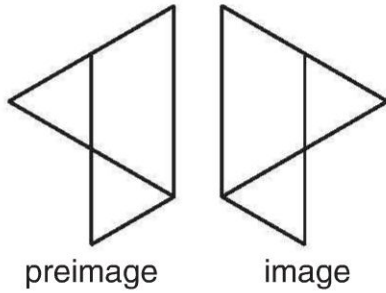
STUDY LINK
10•2

Lines of Reflection

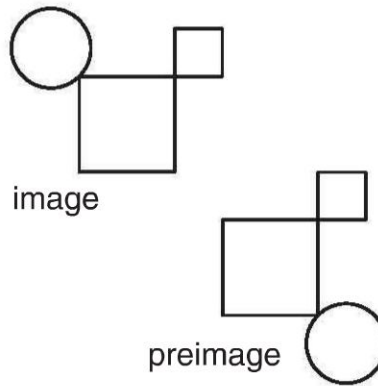


For each preimage and image, draw the line of reflection.

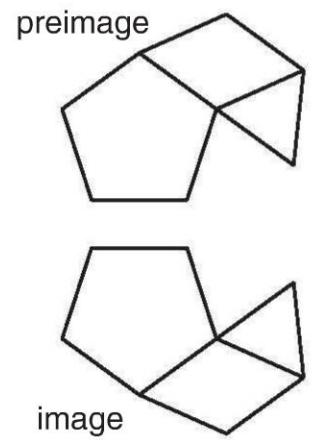
1.



2.

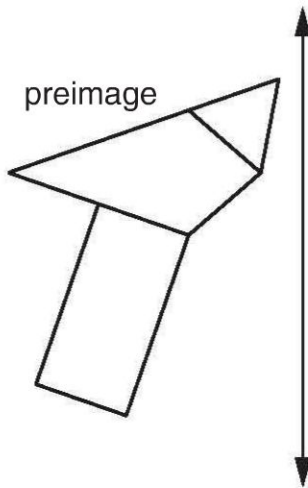


3.

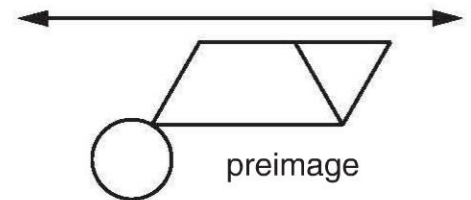


For each preimage, use your Geometry Template to draw the image on the other side of the line of reflection.

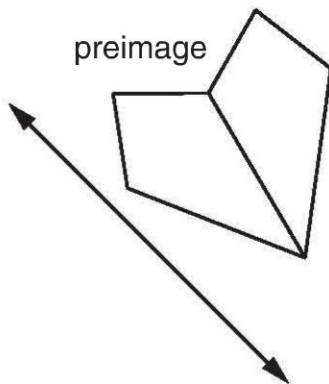
4.



5.



6.



7. Create one of your own.
preimage





Shade squares to create the reflected image of each preimage.

1. preimage image

line of reflection

2. image preimage

line of reflection

3. preimage image

line of reflection

4. image preimage

line of reflection

Practice

5. $54 * 6 =$ _____

6. $29 * 36 =$ _____

7. _____ $= 45 * 45$

8. _____ $= 837 * 63$

STUDY LINK
10•4

Line Symmetry in the Alphabet



1. Print the 26 capital letters of the alphabet below.

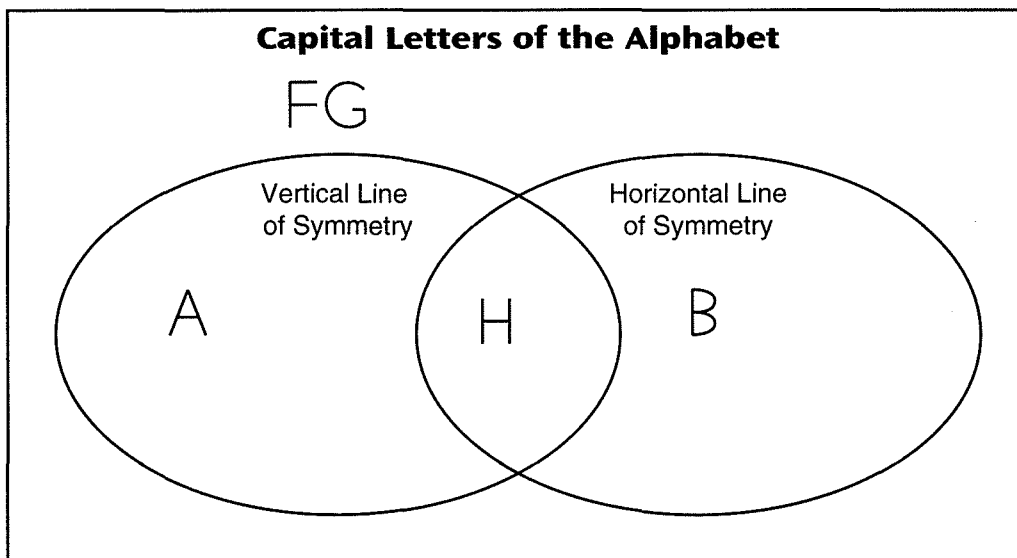
2. The capital letter A has a vertical line of symmetry.



The capital letter B has a horizontal line of symmetry.



Use the letters of the alphabet to complete the Venn diagram.



3. The word BED has a horizontal line of symmetry.



The word HIT has a vertical line of symmetry.



Use capital letters to list words that have horizontal or vertical line symmetry.

horizontal

vertical

Practice

4. $86 \div 9 =$ _____

5. _____ = $68 / 4$

6. $6 \overline{)742} =$ _____

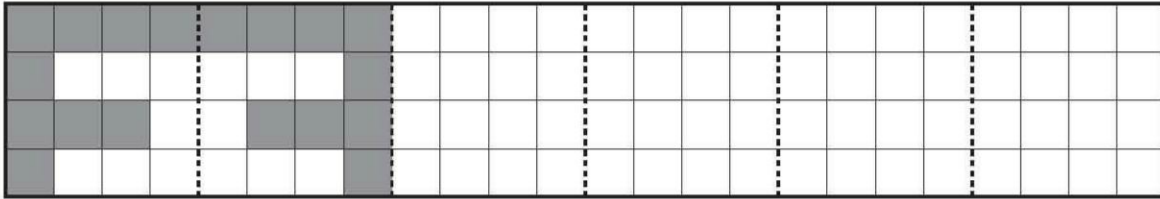
7. _____ = $855 / 7$

Geometric Patterns

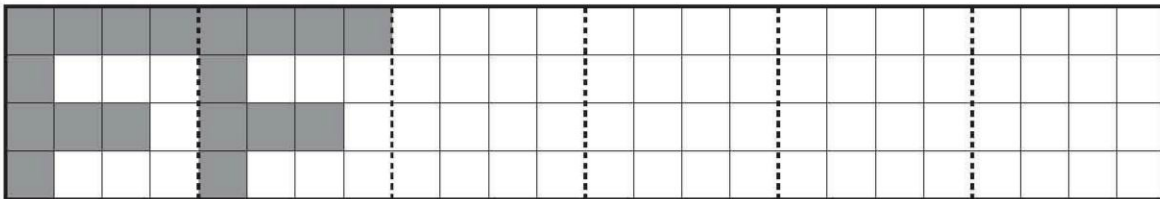


1. Continue each pattern. Then tell if you continued the pattern by using a reflection, rotation, or translation of the original design.

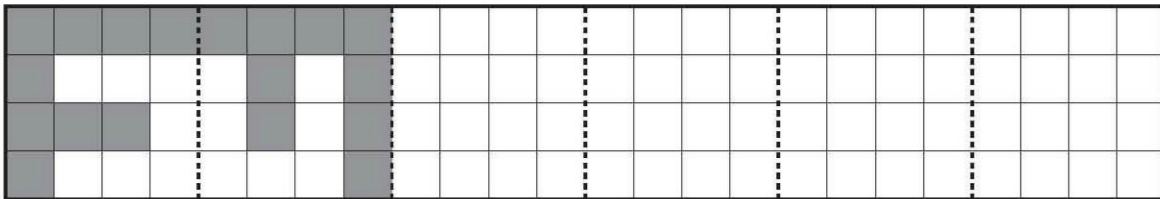
a. _____



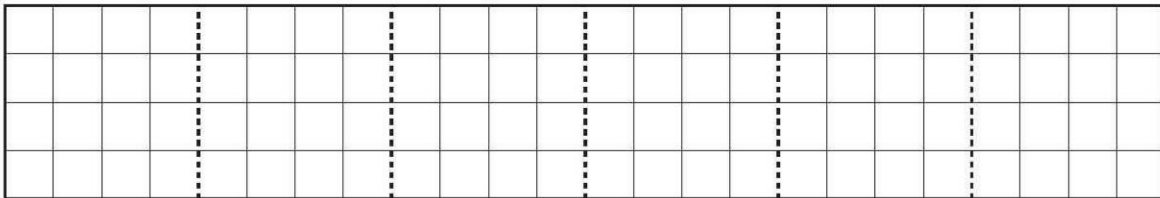
b. _____



c. _____



2. Make up your own pattern.



Practice

3. 50% of \$25.00 = _____
4. 25% of \$10.00 = _____
5. _____ = 40% of \$150.00
6. _____ = 20% of \$250.00

LESSON
10•7**Self Assessment**Progress
Check 10

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

Skills	I can do this on my own and explain how to do it.	I can do this on my own.	I can do this if I get help or look at an example.
1. Give fraction, decimal, and percent equivalencies.			
2. Add positive and negative numbers.			
3. Use a mirror to draw reflections (flips).			
4. Identify shapes with line symmetry, and draw lines of symmetry.			
5. Identify and describe translations (slides).			
6. Identify and describe rotations (turns).			



3-D Shapes, Weight, Volume, and Capacity

Our next unit introduces several new topics, as well as reviewing some of the work with geometric solids from previous grades and some of the main ideas your child has been studying this past year.

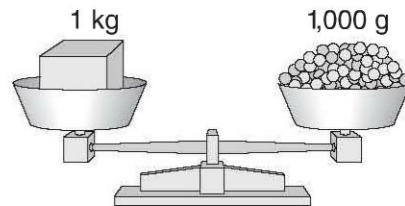
We begin with a lesson on weight and mass, focusing on grams and ounces. Students handle and weigh a variety of objects, trying to develop “weight sense” so that they can estimate weights effectively. The class participates in creating a Gram & Ounce Museum by displaying everyday objects labeled with their weights.

As part of a review of the properties of 3-dimensional shapes (prisms, pyramids, cylinders, and cones), your child will construct models of geometric solids using straws and paper patterns. They will use these models as they discuss vocabulary such as *face*, *edge*, and *vertex* and compare features of geometric solids.

By experimenting with cubes, the class will develop and apply a formula for finding the volumes of rectangular prisms (solids that look like boxes).

We will consider units of capacity (cups, pints, quarts, gallons, liters, milliliters) and the relationships among them. The class participates in creating a Liter & Milliliter Museum by displaying everyday objects labeled with their capacities.

Your child will also explore subtraction of positive and negative numbers by playing a variation of the *Credits/Debits Game* introduced in Unit 10.



In Lesson 11-1, a pan balance is used to measure weight in grams.

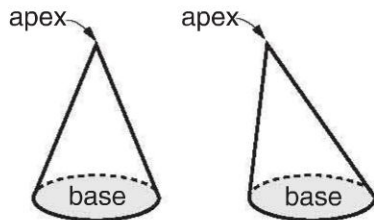
Please keep this Family Letter for reference as your child works through Unit 11.

Vocabulary

Important terms in Unit 11:

capacity (1) The amount of space occupied by a 3-dimensional shape. Same as *volume*. (2) Less formally, the amount a container can hold. Capacity is often measured in units such as quarts, gallons, cups, or liters. (3) The maximum *weight* a scale can measure.

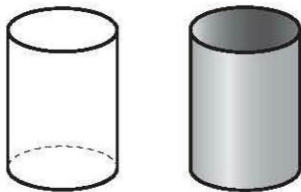
cone A 3-dimensional shape that has a circular base, a *curved surface*, and one vertex, which is called the apex. The points on the curved surface of a cone are on straight lines connecting the apex and the circumference of the base.



cubic unit A unit used in measuring *volume*, such as a cubic centimeter or a cubic foot.

curved surface A 2-dimensional surface that is rounded rather than flat. Spheres, *cylinders*, and *cones* each have one curved surface.

cylinder A 3-dimensional shape that has two circular or elliptical bases that are parallel and congruent and are connected by a *curved surface*. A can is shaped like a cylinder.

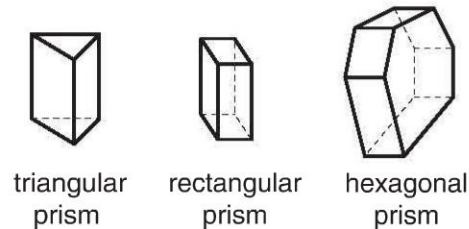


dimension A measure along one direction of an object, typically length, width, or height. For example, the dimensions of a box might be 24 cm by 20 cm by 10 cm.

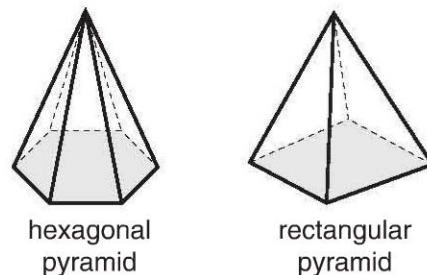
formula A general rule for finding the value of something. A formula is often written using letters, called variables, that stand for the quantities involved.

geometric solid The surface or surfaces that make up a 3-dimensional shape, such as a *prism*, *cylinder*, *cone*, or sphere. Despite its name, a geometric solid is hollow; it does not contain the points in its interior.

prism A 3-dimensional shape with two parallel and congruent polygonal regions for bases and lateral faces formed by all the line segments with endpoints on corresponding edges of the bases. The lateral faces are all parallelograms.



pyramid A 3-dimensional shape with a polygonal region for a base, a point (apex) not in the plane of the base, and all of the line segments with one endpoint at the apex and the other on an edge of the base. All faces except the base are triangular.



3-dimensional (3-D) shape A shape whose points are not all in a single plane. Examples include *prisms*, *pyramids*, and spheres, all of which have length, width, and height.

volume The amount of space occupied by a 3-dimensional shape. Same as *capacity*. The amount a container can hold. Volume is often measured in cubic units, such as cm^3 , cubic inches, or cubic feet.

weight A measure of the force of gravity on an object. Weight is measured in metric units such as grams, kilograms, and milligrams and in U.S. customary units such as pounds and ounces.

Do-Anytime Activities

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

1. Have your child compile a list of the world's heaviest objects or things. For example, which animal has the heaviest baby? What is the world's heaviest human-made structure? What is the greatest amount of weight ever hoisted by a person?
2. Have your child compile a portfolio of 3-dimensional shapes. Images can be taken from newspapers, magazines, photographs, and so on.
3. Encourage your child to create his or her own mnemonics and/or sayings for converting between units of capacity and weight. One such example is the old English saying "A pint's a pound the world around." (1 pint = 16 oz = 1 lb)

Building Skills through Games

In Unit 11, your child will play the following games. For detailed instructions, see the *Student Reference Book*.

Chances Are See *Student Reference Book*, page 236.

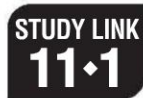
This game is for 2 players and requires one deck of *Chances Are* Event Cards and one deck of *Chances Are* Probability Cards. The game develops skill in using probability terms to describe the likelihood of events.

Credits/Debits Game See *Student Reference Book*, page 238.

This is a game for 2 players. Game materials include 1 complete deck of number cards and a recording sheet. The *Credits/Debits Game* helps students practice addition of positive and negative integers.

Credits/Debits Game (Advanced Version) See *Student Reference Book*, page 239.

This game is similar to the *Credits/Debits Game* and helps students practice addition and subtraction of positive and negative integers.



The World's Largest Foods



Food	Weight	Date	Location
Apple	3 pounds 11 ounces	October 1997	Linton, England
Bagel	714 pounds	July 1998	Mattoon, Illinois
Bowl of pasta	7,355 pounds	February 2004	Hartford, New York
Chocolate bar	5,026 pounds	March 2000	Turin, Italy
Garlic	2 pounds 10 ounces	1985	Eureka, California
Gingerbread man	372.13 pounds	November 2003	Vancouver, Canada
Hamburger	6,040 pounds	September 1999	Sac, Montana
Ice cream sundae	22.59 tons	July 1988	Alberta, Canada
Pumpkin	1,337 pounds	October 2002	Topsfield, Massachusetts
Taco	1,654 pounds	March 2003	Mexicali, Mexico

Source: www.guinnessworldrecords.com

Use the information in the table to solve the following problems.

- The largest apple weighed _____ ounces.
- A typical hamburger weighs about 4 ounces. The largest hamburger weighed _____ ounces.
- Which 2 foods together weigh about a ton? _____ and _____
- A kilogram is a little more than 2 pounds. Which 4 foods each weigh more than 1,000 kilograms?

- On the back of this page, use data from the table to write and solve your own problem.

Practice

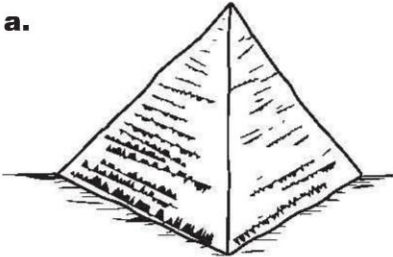




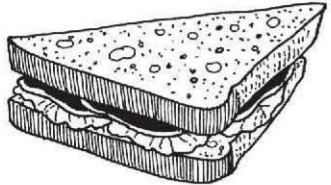
- $-\$75 + \$25 =$ _____
- $_____ = -\$45 + (-\$30)$
- $_____ = -\$60 + \60
- $\$55 + (-\$25) =$ _____

STUDY LINK
11•2

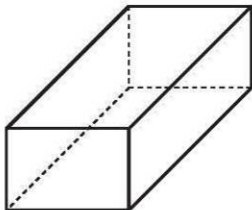
Solids



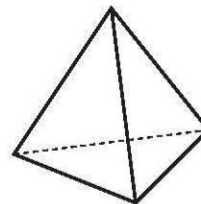
1. The pictures below show objects that are shaped approximately like geometric solids. Identify each object as one of the following: **cylinder**, **cone**, **sphere**, **triangular prism**, **square pyramid**, or **rectangular prism**.

<p>a.</p>  <p>Type: _____ _____</p>	<p>b.</p>  <p>Type: _____ _____</p>	<p>c.</p>  <p>Type: _____ _____</p>
<p>d.</p>  <p>Type: _____ _____</p>	<p>e.</p>  <p>Type: _____ _____</p>	<p>f.</p>  <p>Type: _____ _____</p>

2. Mark Xs on the vertices of the rectangular prism.



3. How many edges does the tetrahedron have? _____ edges



Practice

4. Circle the numbers that are multiples of 7. 132 7,000 63 560 834 91
5. Circle the numbers that are multiples of 12. 24 120 38 600 100 75

STUDY LINK
11•3

Geometry Riddles



Answer the following riddles.

- 1.** I am a geometric solid.
I have two surfaces:
One of my surfaces is formed by a circle.
The other surface is curved.
What am I? _____

- 2.** I am a geometric solid.
I have one square base.
I have four triangular faces.
Some Egyptian pharaohs were buried
in tombs shaped like me.
What am I? _____

- 3.** I am a polyhedron.
I am a prism.
My two bases are hexagons.
My other faces are rectangles.
What am I? _____

- 4.** I am a polyhedron.
All of my faces are the same.
All of my faces are equilateral triangles.
I have eight faces.
What am I? _____

Try This

- 5.** Write your own geometry riddle.

Practice

6. $-\$20 + \$30 =$ _____

7. _____ $= -\$35 + (-\$35)$

8. _____ $= \$10 + (-\$25)$

9. $\$0 + (-\$100) =$ _____

10. $-\$15 + (-\$40) =$ _____

11. _____ $= -\$300 + (-\$100)$

STUDY LINK
11•4

Volume



Cut out the pattern below and tape it together to form an open box.

1. Find and record two items in your home that have volumes equal to about $\frac{1}{2}$ of the volume of the open box.

2. Find and record two items in your home that have about the same volume as the open box.

3. Find and record two items in your home that have volumes equal to about 2 times the volume of the open box.

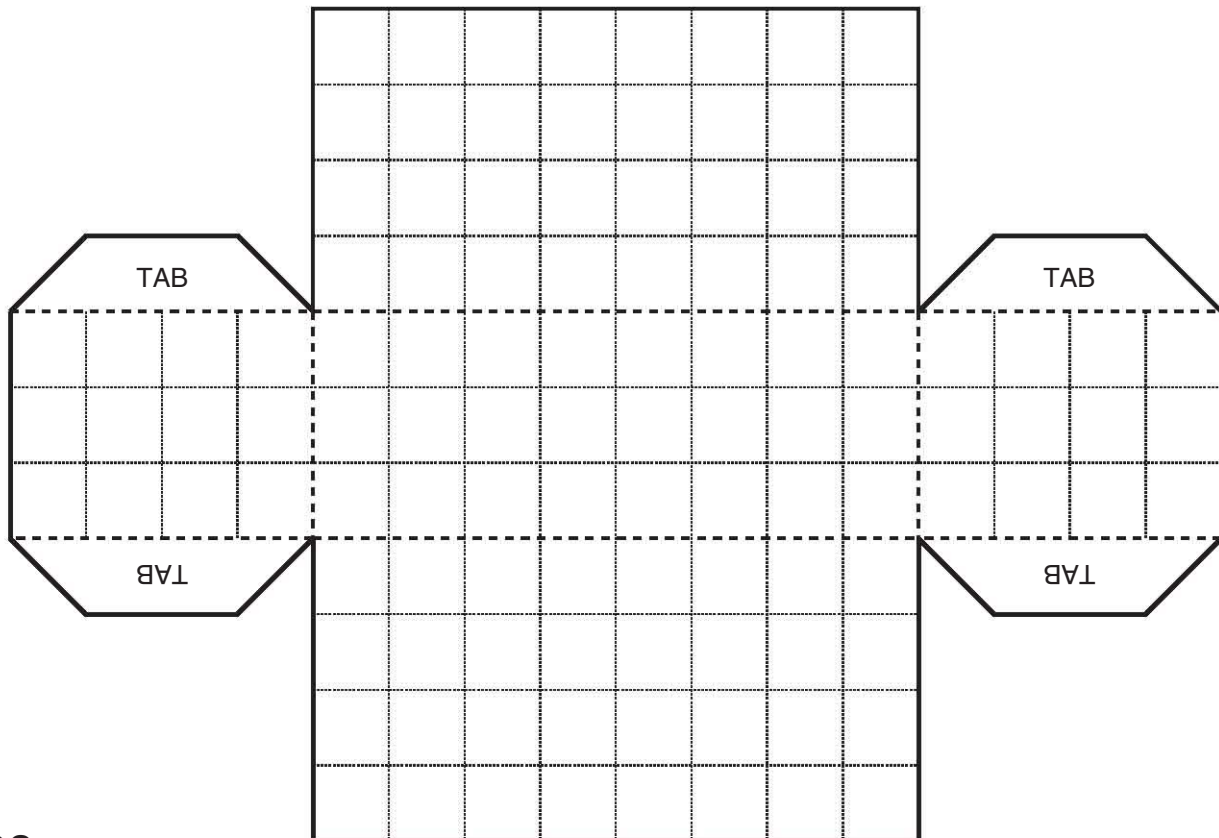
Practice

4. $96 \div 4 =$ _____

5. $86 / 5 =$ _____

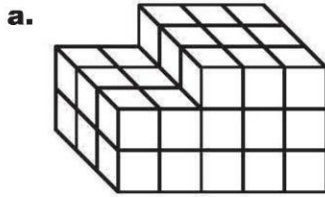
6. $\frac{232}{8} =$ _____

7. $4 \overline{)358} =$ _____

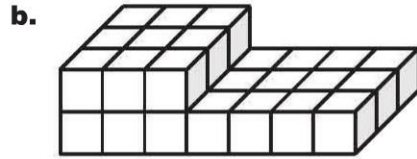




1. Find the volume of each stack of centimeter cubes.

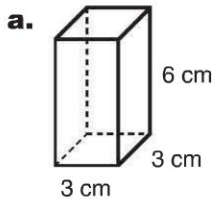


Volume = _____ cm^3



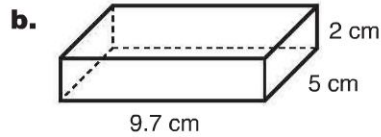
Volume = _____ cm^3

2. Calculate the volume of each rectangular prism.



Number model: _____

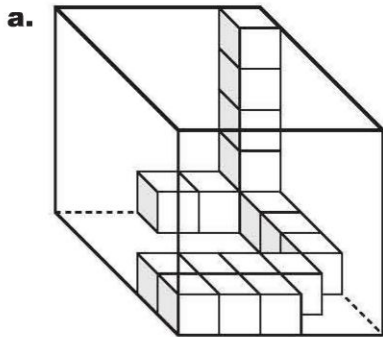
Volume = _____ cm^3



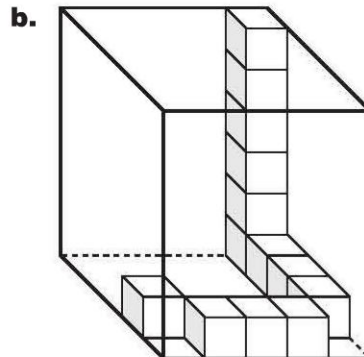
Number model: _____

Volume = _____ cm^3

3. What is the total number of cubes needed to completely fill each box?



_____ cubes



_____ cubes

Practice

4. $-65 + 16 =$ _____

5. _____ $= -21 + (-19)$

6. _____ $= 84 + (-55)$

7. $-16 + 89 =$ _____

STUDY LINK
11•6

Positive and Negative Numbers



Add or subtract.

1. $-40 + (-70) =$ _____

2. $12 - 20 =$ _____

3. _____ $= -14 - (-6)$

4. _____ $= 10 - (-5)$

5. $15 + (-1) =$ _____

6. $-12 - 7 =$ _____

7. _____ $= 60 + (-130)$

8. _____ $= -2 - (-20)$

9. Write two subtraction problems with an answer of -8 .

_____ $-$ _____ $= -8$ _____ $-$ _____ $= -8$

10. Write two addition problems with an answer of -30 .

_____ $+$ _____ $= -30$ _____ $+$ _____ $= -30$

Write $<$ or $>$ to make a true number sentence.

11. $0 - 7$ _____ -6

12. -11 _____ $-13 - (-5)$

13. $7 + (-2)$ _____ -8

14. $18 + (-8)$ _____ -18

15. $26 - (-14)$ _____ $27 + (-16)$

16. $9 - (-11)$ _____ $0 + (-20)$

List the numbers in order from least to greatest.

17. $\frac{30}{6}$, 8 , -14 , -0.7 , 5.6 , -2.5

_____ least _____ greatest

18. 0.02 , $-\frac{3}{5}$, -7 , 4 , 0.46 , $-\frac{24}{6}$

_____ least _____ greatest

Practice

19. _____ $= 34 * 78$

20. _____ $= 46 * 959$

21. $632 \div 4 =$ _____

22. $746 / 7 =$ _____

STUDY LINK
11•7

Capacity



Find at least one container that holds each of the amounts listed below.

Describe each container and record all the capacity measurements on the label.



1. Less than 1 Pint

Container	Capacity Measurements on Label
<i>bottle of hot chili sesame oil</i>	<i>5 fl oz, 148 mL</i>

2. 1 Pint

Container	Capacity Measurements on Label
<i>bottle of cooking oil</i>	<i>16 fl oz, 473 mL</i>

3. 1 Quart

Container	Capacity Measurements on Label

4. More than 1 Quart

Container	Capacity Measurements on Label

Complete.

5. 2 quarts = _____ pints

6. 3 gallons = _____ cups

7. _____ pints = 4 cups

8. _____ quarts = 12 cups

9. 6 pints = _____ quarts

10. _____ quarts = $2\frac{1}{2}$ gallons

Practice

11. $-3 + 7 =$ _____

12. _____ = $3 + (-7)$

13. _____ = $40 + (-80)$

14. $-60 + (-60) =$ _____

LESSON
11•8**Self Assessment**Progress
Check 11

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

Skills	I can do this on my own and explain how to do it.	I can do this on my own.	I can do this if I get help or look at an example.
1. Add positive and negative numbers.			
2. Subtract positive and negative numbers.			
3. Describe events using terms such as: <i>certain</i> , <i>likely</i> , <i>very unlikely</i> , and <i>impossible</i> .			
4. Count cubes to find the volume of a rectangular prism.			
5. Use a formula to find the volume of a rectangular prism.			
6. Identify, describe, and compare solid figures such as: <i>rectangular prisms</i> , <i>pyramids</i> , and <i>cones</i> .			

STUDY LINK
11•8**Unit 12: Family Letter****Rates**

For the next two or three weeks, your child will be studying rates. Rates are among the most common applications of mathematics in daily life.

A rate is a comparison involving two different units. Familiar examples come from working (dollars per hour), driving (miles per hour), eating (calories per serving), reading (pages per day), and so on.

Our exploration of rates will begin with students collecting data on the rate at which their classmates blink their eyes. The class will try to answer the question "Does a person's eye-blinking rate depend on what the person is doing?"

During this unit, students will collect many examples of rates and might display them in a Rates All Around Museum. Then they will use these examples to make up rate problems, such as the following:

1. If cereal costs \$2.98 per box, how much will 4 boxes cost?
2. If a car's gas mileage is about 20 miles per gallon, how far can the car travel on a full tank of gas (16 gallons)?
3. If I make \$6.25 per hour, how long must I work to earn enough to buy shoes that cost \$35?

Then the class will work together to develop strategies for solving rate problems.

The unit emphasizes the importance of mathematics to educated consumers. Your child will learn about unit-pricing labels on supermarket shelves and how to use these labels to decide which of two items is the better buy. Your child will see that comparing prices is only *part* of being an educated consumer. Other factors to consider include quality, the need for the product, and, perhaps, the product's effect on the environment.

This unit provides a great opportunity for your child to help with the family shopping. Have your child help you decide whether the largest size is really the best buy. Is an item that is on sale necessarily a better buy than a similar product that is not on sale?

Finally, students will look back on their experiences in the yearlong World Tour project and 50-facts test routine and share them with one another.

Please keep this Family Letter for reference as your child works through Unit 12.

Nutrition Facts	
Serving Size 1 link (45 g)	
Servings per Container 10	
Amount per Serving	
Calories 150	Calories from Fat 120
	% Daily Value
Total Fat 13 g	20%
Total Carbohydrate 1 g	<1%
Protein 7 g	

Vocabulary

Important terms in Unit 12:

comparison shopping Comparing prices and collecting other information needed to make good decisions about which of several competing products or services to buy.

consumer A person who acquires products or uses services.

per For each, as in ten chairs per row or six tickets per family.

rate A comparison by division of two quantities with different units. For example, a speed such as 55 miles per hour is a rate that compares distance with time.

rate table A way of displaying *rate* information as in the miles per gallon table below.

Miles	35	70	105	140	175	210
Gallons	1	2	3	4	5	6

unit price The price *per* item or unit of measure. For example, if a 5-ounce package of something costs \$2.50, then \$0.50 per ounce is the unit price.

unit rate A *rate* with 1 in the denominator. For example, 600 calories per 3 servings or $\frac{600 \text{ calories}}{3 \text{ servings}}$ is not a unit rate, but 200 calories per serving ($\frac{200 \text{ calories}}{1 \text{ serving}}$) is a unit rate.



Do-Anytime Activities

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

1. Have your child examine the Nutrition Facts labels on various cans and packages of food. The labels list the number of servings in the container and the number of calories per serving. Have your child use this information to calculate the total number of calories in the full container or package. *For example:*
A can of soup has 2.5 servings.
There are 80 calories per serving.
So the full can has $2.5 * 80 = 200$ calories.
2. Have your child point out rates in everyday situations. *For example:*
store price rates: cost per dozen, cost per 6-pack, cost per ounce
rent payments: dollars per month or dollars per year
fuel efficiency: miles per gallon
wages: dollars per hour
sleep: hours per night
telephone rates: cents per minute
copy machine rates: copies per minute
3. Use supermarket visits to compare prices for different brands of an item and for different sizes of the same item. Have your child calculate unit prices and discuss best buys.

Building Skills through Games

In this unit, your child will play the following games. For more detailed instructions, see the *Student Reference Book*.

Credits/Debits Game (Advanced Version) See *Student Reference Book*, page 239.

This game for 2 players simulates bookkeeping for a small business. A deck of number cards represents "credits" and "debits." Transactions are entered by the players on recording sheets. The game offers practice in addition and subtraction of positive and negative integers.

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

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

Name That Number See *Student Reference Book*, page 254.

This game is for 2 or 3 players and requires 1 complete deck of number cards. The game develops skills in representing numbers in different ways.

STUDY LINK
12·1

Examples of Rates



1. Look for examples of rates in newspapers, in magazines, and on labels.

Study the two examples below, and then list some of the examples you find.

If possible, bring your samples to class.

Example: *Label on a can of corn*

says "Servings Per Container 3 $\frac{1}{2}$ "

Nutrition Facts

Serving Size 110 g
 Servings Per Container 3 $\frac{1}{2}$
 Amount Per Serving

Example: *Lightbulbs come in packages of 4 bulbs.*

The package doesn't say so, but there are always 4 bulbs in each package.

Example: _____

Example: _____

Example: _____

Practice

2. $\frac{4}{5} - \frac{1}{5} =$ _____

3. _____ $= \frac{7}{8} - \frac{3}{4}$

4. _____ $= \frac{1}{9} + \frac{8}{9}$

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

STUDY LINK
12·2

Rates



Solve the problems.

- Hotels R Us charges \$45 per night for a single room.
At that rate, how much does a single room cost *per week*? \$ _____
- The Morales family spends about \$84 each week for food. On average, how much do they spend *per day*? \$ _____
- Sharon practices playing the piano the same amount of time each day. She practiced a total of 4 hours on Monday and Tuesday combined. At that rate, how many hours would she practice *in a week*? _____ hours

Hours							
Days	1	2	3	4	5	6	7

Try This

- People in the United States spend an average of 6 hours and 4 minutes each week reading newspapers.
 - That's how many minutes *per week*? _____ minutes per week
 - At that rate, how much time does an average person spend reading newspapers in a *3-day period*? _____ minutes

Minutes							
Days	1	2	3	4	5	6	7

Practice

- _____ = $24 * 379$
- $870 * 63 =$ _____
- $652 \div 8 =$ _____
- $546 \div 42 =$ _____

STUDY LINK
12•3

Mammal Rates



1. A mole can dig a tunnel 300 feet long in one night.
How far could a mole dig in one week? About _____ feet

2. An elephant may eat 500 pounds of hay and drink 60 gallons of water in one day.
 - a. About how many pounds of hay could an elephant eat per week? About _____ pounds
 - b. About how many gallons of water could an elephant drink per week? About _____ gallons

3. The bottle-nosed whale can dive to a depth of 3,000 feet in 2 minutes. About how many feet is that per second? About _____ feet per second

4. A good milking cow will give up to 1,500 gallons of milk in a year.
 - a. About how many gallons is that in 3 months? About _____ gallons
 - b. About how many *quarts* is that in 3 months? About _____ quarts

Try This

5. Sloths spend up to 80 percent of their lives sleeping. Not only is a sloth extremely sleepy, but it is also very slow. A sloth travels on the ground at a speed of about 7 feet per minute. In the trees, its speed is about 15 feet per minute.
 - a. After one hour, how much farther would a sloth have traveled in the trees than on the ground (if it didn't stop to sleep)? About _____ feet
 - b. About how long would it take a sloth to travel 1 mile on the ground? (*Hint:* There are 5,280 feet in a mile.) About _____ minutes,
or _____ hours

Practice

6. $59 * 27 =$ _____
7. _____ $= 648 * 85$
8. $904 \div 5 =$ _____
9. _____ $= 536 / 8$

STUDY LINK
12•4

Unit Prices



Solve the unit price problems below. Complete the tables if it is helpful to do so.



1. A 12-oz bag of pretzels costs 96 cents. The unit price is _____ per ounce.

Dollars				0.96
Ounces	1	3	9	12

2. A package of 3 rolls of paper towels costs \$2.07. The unit price is _____ per roll.

Dollars			2.07
Rolls	1	2	3

3. A 4-liter bottle of water costs \$1.40. The unit price is _____ per liter.

Dollars				1.40
Liters	1	2	3	4

4. Choose 4 items from newspaper ads. In the table below, record the name, price, and quantity of each item. Leave the Unit Price column blank.

Item	Quantity	Price	Unit Price
<i>Golden Sun Raisins</i>	<i>24 ounces</i>	<i>\$2.99</i>	

Practice

Name the factor pairs for each number.

5. 12 _____ 6. 50 _____

STUDY LINK
12•5

Unit Pricing



1. A package of 3 muffins costs \$1.89.
What is the price *per muffin*? _____
2. A 5-pound bag of rice costs \$1.85.
What is the price *per pound*? _____
3. Chewy worms are sold at \$2.40 per pound.
What is the price *per ounce*? _____
4. A 6-pack of bagels costs \$2.11.
What is the price *per bagel*? _____
5. A 2-pound bag of frozen corn costs \$2.03.
What is the price *per pound*? _____
6. A store sells yogurt in two sizes: The 8-ounce cup costs 72 cents, and the 6-ounce cup costs 60 cents. Which is the better buy? Explain your answer.

7. Make up your own “better buy” problem. Then solve it.

Practice

Name all the factors.

8. 42 _____

9. 23 _____

STUDY LINK
12•6

Country Statistics



- China has the longest border in the world—13,759 miles.
Russia has the second longest border in the world—12,514 miles.
How much shorter is Russia's border than China's border? _____ miles
- The area of Russia is about 1,818,629 square miles. The area of Spain, including offshore islands, is about 194,897 square miles.
About how many times larger is Russia than Spain? _____ times larger
- Students in China attend school about 251 days per year.
Students in the United States attend school about 180 days per year.
 - About what percent of the year do Chinese students spend in school? _____%
 - About what percent of the year do American students spend in school? _____%
- English is officially spoken in 54 countries. Portuguese is officially spoken in 8 countries. Portuguese is spoken in about what fraction of the number of English-speaking countries? _____

5. The table to the right shows the countries in the world with the most neighboring countries.

Country	Number of Neighbors
Brazil	10
China	15
Dem. Rep. of Congo	9
Germany	9
Russia	14
Sudan	9

Use the data in the table to answer the following questions.

- Which country has the maximum number of neighbors? _____
- What is the range? _____
- What is the mode? _____
- What is the median? _____

LESSON
12·7**Self Assessment**Progress
Check 12

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

Skills	I can do this on my own and explain how to do it.	I can do this on my own.	I can do this if I get help or look at an example.
1. Find factors and factor pairs.			
2. Compare and order positive and negative fractions.			
3. Add positive and negative numbers.			
4. Subtract positive and negative numbers.			
5. Solve rate problems.			
6. Convert among U.S. customary units of capacity.			
7. Solve open sentences.			



Congratulations!

By completing *Fourth Grade Everyday Mathematics*, your child has accomplished a great deal. Thank you for all of your support.

This Family Letter is a resource to use throughout your child's vacation. It includes an extended list of Do-Anytime Activities, directions for games that can be played at home, a list of mathematics-related books to check out over vacation, and a sneak preview of what your child will be learning in *Fifth Grade Everyday Mathematics*. Enjoy the vacation!

Do-Anytime Activities

Mathematics means more when it is rooted in real-life situations.

To help your child review many of the concepts he or she has learned in fourth grade, we suggest the following activities for you and your child to do together over vacation. These activities will help your child build on the skills he or she has learned this year and help prepare him or her for *Fifth Grade Everyday Mathematics*.

1. Have your child practice any multiplication and division facts that he or she has not yet mastered. Include some quick drills.
2. Provide items for your child to measure. Have your child use personal references, as well as U.S. customary and metric measuring tools.
3. Use newspapers and magazines as sources of numbers, graphs, and tables that your child may read and discuss.
4. Have your child practice multidigit multiplication and division using the algorithms that he or she is most comfortable with.
5. Ask your child to look at advertisements and find the sale prices of items using the original prices and rates of discount or find rates of discount using original prices and sale prices. Have your child use a calculator and calculate unit prices to determine best or better buys.
6. Continue the World Tour by reading about other countries.



Building Skills through Games

The following section lists rules for games that can be played at home. You will need a deck of number cards, which can be made from index cards or by modifying a regular deck of cards as follows:

A regular deck of playing cards includes 54 cards (52 regular cards plus 2 jokers).

Use a permanent marker to mark some of the cards:

- ◆ Mark each of the four aces with the number 1.
- ◆ Mark each of the four queens with the number 0.
- ◆ Mark the four jacks and four kings with the numbers 11 through 18.
- ◆ Mark the two jokers with the numbers 19 and 20.

Beat the Calculator

Materials number cards 1–10 (4 of each); calculator

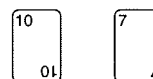
Players 3

Directions

1. One player is the “Caller,” one is the “Calculator,” and one is the “Brain.”
2. Shuffle the deck of cards and place it facedown.
3. The Caller draws two cards from the number deck and asks for their product.
4. The Calculator solves the problem with a calculator. The Brain solves it without a calculator. The Caller decides who got the answer first.
5. The Caller continues to draw two cards at a time from the number deck and asks for their product.
6. Players trade roles every 10 turns or so.

Example: The Caller draws a 10 and 7 and calls out “10 times 7.”

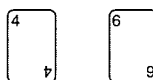
The Brain and the Calculator solve the problem.



The Caller decides who got the answer first.

Variation 1: To practice extended multiplication facts, have the Caller draw two cards from the number deck and attach a 0 to either one of the factors or to both factors before asking for the product.

Example: If the Caller turns over a 4 and a 6, he or she may make up any one of the following problems:



4 * 60 40 * 6 40 * 60

Variation 2: Use a full set of number cards: 4 each of the numbers 1–10, and 1 each of the numbers 11–20.

STUDY LINK
12•7
Family Letter *cont.*

Building Skills through Games

Name That Number

Materials 1 complete deck of number cards

Players 2 or 3

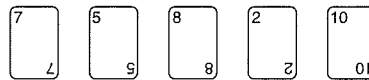
Object of the game To collect the most cards

Directions

- Shuffle the cards and deal five cards to each player. Place the remaining cards number-side down. Turn over the top card and place it beside the deck. This is the **target number** for the round.
- Players try to match the target number by adding, subtracting, multiplying, or dividing the numbers on as many of their cards as possible. A card may be used only once.
- Players write their solutions on a sheet of paper or a slate. When players have written their best solutions:
 - ◆ They set aside the cards they used to name the target number.
 - ◆ Replace them by drawing new cards from the top of the deck.
 - ◆ Put the old target number on the bottom of the deck.
 - ◆ Turn over a new target number, and play another hand.
- Play continues until there are not enough cards left to replace all of the players' cards. The player who sets aside more cards wins the game.

Example: Target number: 16

A player's cards:



Some possible solutions:

$$10 + 8 - 2 = 16 \text{ (three cards used)}$$

$$7 * 2 + 10 - 8 = 16 \text{ (four cards used)}$$

$$8 / 2 + 10 + 7 - 5 = 16 \text{ (all five cards used)}$$

The player sets aside the cards used to make a solution and draws the same number of cards from the top of the deck.

**Family Letter** *cont.*

Vacation Reading with a Mathematical Twist

Books can contribute to children's learning by presenting mathematics in a combination of real-world and imaginary contexts. The titles listed below were recommended by teachers who use *Everyday Mathematics* in their classrooms. They are organized by mathematical topic. Visit your local library and check out these mathematics-related books with your child.

Geometry

A Cloak for the Dreamer by Aileen Friedman

The Greedy Triangle by Marilyn Burns

Measurement

The Magic School Bus Inside the Earth by Joanna Cole

The Hundred Penny Box by Sharon Bell Mathis

Numeration

Alexander, Who Used to be Rich Last Sunday by Judith Viorst

If You Made a Million by David M. Schwartz

Fraction Action by Loreen Leedy

How Much Is a Million? by David M. Schwartz

Operations

Anno's Mysterious Multiplying Jar by Masaichiro Anno

The King's Chessboard by David Birch

One Hundred Hungry Ants by Elinor J. Pinczes

A Remainder of One by Elinor J. Pinczes

Patterns, Functions, and Sequences

Eight Hands Round by Ann Whitford Paul

Visual Magic by David Thomas

Reference Frames

The Magic School Bus: Inside the Human Body by Joanna Cole

Pigs on a Blanket by Amy Axelrod

Looking Ahead: Fifth Grade Everyday Mathematics

Next year your child will . . .

- ◆ Develop skills with decimals and percents
- ◆ Continue to practice multiplication and division skills, including operations with decimals
- ◆ Investigate methods for solving problems using mathematics in everyday situations
- ◆ Work with number lines, times, dates, and rates
- ◆ Collect, organize, describe, and interpret numerical data
- ◆ Further explore the properties, relationships, and measurement of 2- and 3-dimensional objects
- ◆ Read, write, and use whole numbers, fractions, decimals, percents, negative numbers, and exponential notation
- ◆ Explore scientific notation

Again, thank you for all of your support this year. Have fun continuing your child's mathematical experiences throughout the vacation!

