

1-1**Practice: Word Problems*****A Plan for Problem Solving***

Use the four-step plan to solve each problem.

GEOGRAPHY For Exercises 1 and 2, use the poster information about Crater Lake National Park in Oregon.

Visit Crater Lake National Park

90 miles of trails
26 miles of shoreline
Boat tours available
Open 24 hours

Directions from Klamath Falls: Take U.S. Highway 97 north 21 miles, then go west on S.R. 62 for 29 miles.

<p>1. How many more miles of trails are there than miles of shoreline in Crater Lake National Park?</p>	<p>2. How many miles is it from Klamath Falls to Crater Lake National Park?</p>
<p>3. SPORTS Jasmine swims 12 laps every afternoon, Monday through Friday. How many laps does she swim in one week?</p>	<p>4. SPORTS Samantha can run one mile in 8 minutes. At this rate, how long will it take for her to run 5 miles?</p>
<p>5. SPORTS On a certain day, 525 people signed up to play softball. If 15 players are assigned to each team, how many teams can be formed?</p>	<p>6. PATTERNS Complete the pattern: 5, 7, 10, 14, ____, ____, ____</p>
<p>7. SHOPPING Josita received \$50 as a gift. She plans to buy two cassette tapes that cost \$9 each and a headphone set that costs \$25. How much money will she have left?</p>	<p>8. BUS SCHEDULE A bus stops at the corner of Elm Street and Oak Street every half hour between 9 A.M. and 3 P.M. and every 15 minutes between 3 P.M. and 6 P.M. How many times will a bus stop at the corner between 9 A.M. and 6 P.M.?</p>

1-2**Practice: Word Problems*****Divisibility Patterns***

MONTHS OF THE YEAR For Exercises 1–3, use the table that shows how many days are in each month, excluding leap years. (Every four years, the calendar is adjusted by adding one day to February.)

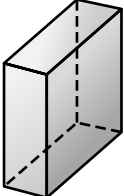
JAN.	FEB.	MAR.	APR.	MAY	JUN.	JUL.	AUG.	SEP.	OCT.	NOV.	DEC.
31	28	31	30	31	30	31	31	30	31	30	31

<p>1. Which month has a number of days that is divisible by 4? During a leap year, is this still true?</p>	<p>2. Which months have a number of days that is divisible by both 5 and 10? During a leap year, is this still true?</p>
<p>3. The total number of months in a year are divisible by which numbers?</p>	<p>4. FOOD Jermaine and his father are in charge of grilling for a family reunion picnic. There will be 40 people attending. Ground beef patties come 5 to a package. How many packages of patties should they buy to provide 1 hamburger for each person? Will there be any patties left over? If so, how many?</p>
<p>5. RETAIL Li is stacking bottles of apple juice on the shelf at her parent's grocery store. She has space to fit 4 bottles across and 6 bottles from front to back. She has 25 bottles to stack. Will all of the bottles fit on the shelf? Explain.</p>	<p>6. FARMING Sally is helping her mother put eggs into egg cartons to sell at the local farmer's market. Their chickens have produced a total of 108 eggs for market. Can Sally package the eggs in groups of 12 so that each carton has the same number of eggs? Explain.</p>

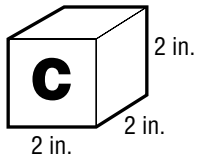
1-3**Practice: Word Problems****Prime Factors**

ANIMALS For Exercises 1–3, use the table that shows the height and weight of caribou.

CARIBOU	Height at the Shoulder		Weight	
	inches	centimeters	pounds	kilograms
Cows (females)	43	107	220	99
Bulls (males)	50	125	400	180

<p>1. Which animal heights and weights are prime numbers?</p>	<p>2. Write the weight of caribou cows in kilograms as a prime factorization.</p>
<p>3. ANIMALS Caribou calves weigh about 13 pounds at birth. Tell whether this weight is a prime or a composite number.</p>	<p>4. SPEED A wildlife biologist once found a caribou traveling at 37 miles per hour. Tell whether this speed is a prime or composite number. Explain.</p>
<p>5. GEOMETRY To find the area of a floor, you can multiply its length times its width. The measure of the area of a floor is 49. Find the most likely length and width of the room.</p>	<p>6. GEOMETRY To find the volume of a box, you can multiply its height, width, and length. The measure of the volume of a box is 70. Find its possible dimensions.</p> 

1-4**Practice: Word Problems*****Powers and Exponents***

<p>1. SPACE The Sun is about $10 \cdot 10$ million miles away from Earth. Write $10 \cdot 10$ using an exponent. Then find the value of the power. How many miles away is the Sun?</p>	<p>2. WEIGHT A 100-pound person on Earth would weigh about $4 \cdot 4 \cdot 4 \cdot 4$ pounds on Jupiter. Write $4 \cdot 4 \cdot 4 \cdot 4$ using an exponent. Then find the value of the power. How much would a 100-pound person weigh on Jupiter?</p>
<p>3. ELECTIONS In the year 2000, the governor of Washington, Gary Locke, received about 10^6 votes to win the election. Write this as a product. How many votes did Gary Locke receive?</p>	<p>4. SPACE The diameter of Mars is about 9^4 kilometers. Write 9^4 as a product. Then find the value of the product.</p>
<p>5. SPACE The length of one day on Venus is 3^5 Earth days. Express this exponent as a product. Then find the value of the product:</p>	<p>6. GEOGRAPHY The area of San Bernardino County, California, the largest county in the U.S., is about 3^9 square miles. Write this as a product. What is the area of San Bernardino County?</p>
<p>7. GEOMETRY The volume of the block shown can be found by multiplying the width, length, and height. Write the volume using an exponent. Find the volume.</p> 	<p>8. SPACE A day on Jupiter lasts about 10 hours. Write a product and an exponent to show how many hours are in 10 Jupiter days. Then find the value of the power.</p>

1-5**Practice: Word Problems****Order of Operations**

MONEY For Exercises 1–3, use the table that shows the price of admission to a movie theater.

Movie Theater Admission
Adults: \$8 Children (under 13): \$5 Matinee (before 6 P.M.): \$3

<p>1. Janelle (age 12) and her cousin, Marquita (age 14), go to a 7:00 P.M. show. Write an expression for the total cost of admission. What is the total cost?</p>	<p>2. Jan takes her three children and two neighbor's children to a matinee. All of the children are under age 13. Write an expression for the total cost of admission. How much in all did Jan pay for admission?</p>
<p>3. Connor (age 13), his sister (age 7), and Connor's parents go to a movie on Saturday night. Write an expression for the total cost. What is the total cost?</p>	<p>4. SOCCER Eduardo is 16. Eduardo's dad takes him and his younger sister to a soccer match. Tickets are \$17 for adults and \$13 for children (18 and under). Write an expression for the total cost of the tickets. What is the total cost of the tickets?</p>
<p>5. MONEY Frankie orders two hamburgers and a soda for lunch. A hamburger is \$3 and a soda is \$1.00. Write an expression to show how much he paid for lunch. Then find the value of the expression.</p>	<p>6. MONEY A store sells barrettes for \$2 each and combs for \$1. Shelby buys 3 barrettes and a comb. Kendra buys 2 barrettes and 4 combs. Write an expression for the amount the two girls spent all together. Find the total amount spent.</p>

1-6**Practice: Word Problems****Algebra: Variables and Expressions**

TRAVEL For Exercises 1 and 2, use the table that shows the distance between cities in Arizona.

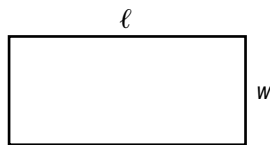
Arizona Mileage Chart

	Flagstaff	Phoenix	Tucson	Nogales
Phoenix	136 miles		117 miles	181 miles
Tucson	253 miles	117 miles		64 miles
Nogales	317 miles	181 miles	64 miles	

1. To find the speed of a car, use the expression $d \div t$ where d represents the distance and t represents time. Find the speed of a car that travels from Phoenix to Flagstaff in 2 hours.

2. To find the time it will take for a bicyclist to travel from Nogales to Tucson, use the expression d/s where d represents distance and s represents speed. Find the time if the bicyclist travels at a speed of 16 miles per hour.

3. PERIMETER The perimeter of a rectangle can be found using the formula $2\ell + 2w$, where ℓ represents the length and w represents the width. Find the perimeter if $\ell = 6$ units and $w = 3$ units.



4. PERIMETER Another formula for perimeter is $2(\ell + w)$. Find the perimeter of the rectangle in Exercise 3 using this formula. How do the answers compare? Explain how you used order of operations using this formula.

5. SHOPPING Write an expression using a variable that shows how much 3 pairs of jeans will cost if you do not know the price of the jeans. Assume each pair costs the same amount.

6. SHOPPING Write an expression using variables to show how much 3 plain T-shirts and 2 printed T-shirts will cost, assuming that the prices of plain and printed T-shirts are not the same.

1-7**Practice: Word Problems****Algebra: Solving Equations**

INSECTS For Exercises 1–3, use the table that gives the average lengths of several unusual insects in centimeters.

Insect	Length (cm)	Insect	Length (cm)
Walking stick	15	Giant water bug	6
Goliath beetle	15	Katydid	5
Giant weta	10	Silkworm moth	4
Harlequin beetle	7	Flower mantis	3

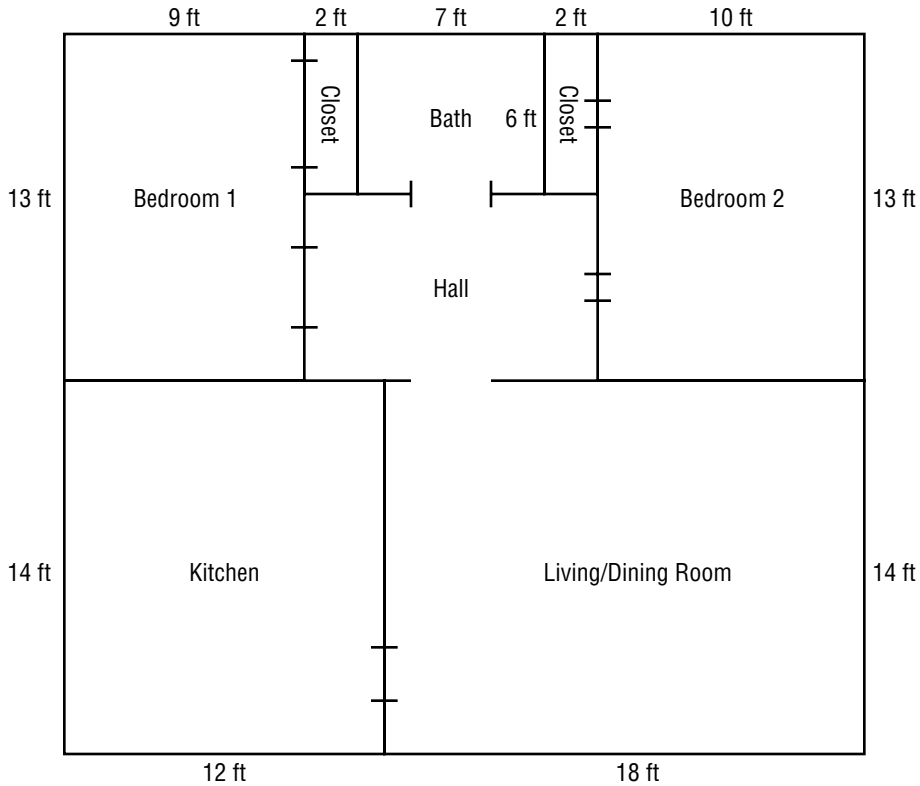
<p>1. The equation $15 - x = 12$ gives the difference in length between a walking stick and one other insect. If x is the other insect, which insect is it?</p>	<p>2. The equation $7 + y = 13$ gives the length of a Harlequin beetle and one other insect. If y is the other insect, which insect makes the equation a true sentence?</p>
<p>3. Bradley found a silkworm moth that was 2 centimeters longer than average. The equation $m - 4 = 2$ represents this situation. Find the length of the silkworm moth that Bradley found.</p>	<p>4. BUTTERFLIES A Monarch butterfly flies about 80 miles per day. So far it has flown 60 miles. In the equation $80 - m = 60$, m represents the number of miles it has yet to fly that day. Find the solution to the equation.</p>
<p>5. CICADAS The nymphs of some cicada can live among tree roots for 17 years before they develop into adults. One nymph developed into an adult after only 13 years. The equation $17 - x = 13$ describes the number of years less than 17 that it lived as a nymph. Find the value of x in the equation to tell how many years less than 17 years it lived as a nymph.</p>	<p>6. BEETLES A harlequin beetle lays eggs in trees. She can lay up to 20 eggs over 2 or 3 days. After the first day, the beetle has laid 9 eggs. If she lays 20 eggs in all, how many eggs will she lay during the second and third day?</p>

1-8

Practice: Word Problems

Geometry: Area of Rectangles

FLOOR PLANS For Exercises 1–6, use the diagram that shows the floor plan for a house.



<p>1. What is the area of the floor in the kitchen?</p>	<p>2. Find the area of the living/dining room.</p>
<p>3. What is the area of the bathroom?</p>	<p>4. Find the area of Bedroom 1.</p>
<p>5. Which two parts of the house have the same area?</p>	<p>6. How much larger is Bedroom 2 than Bedroom 1?</p>

2-1

Practice: Word Problems

Frequency Tables

ANIMALS For Exercises 1–3, use Table A. For Exercises 4–6, use Table B.

Table A

Insects Under a Rock					
E	S	B	E	E	B
S	E	E	B	S	E
S	S	B	E	E	S
B	E	E	E	B	E
S	E	B	S	E	E
B	S	E	E	S	E

B = beetle E = earwig
S = sow bug

Table B

Weights (lb) of Dogs at the Vet Clinic		
Weight	Tally	Frequency
1–10		14
11–20		19
21–30		25
31–40		10
41–50		5

- | | |
|--|--|
| <p>1. Maria is counting three types of insects she finds under rocks in the park for an ecology survey. Make a frequency table showing her data from Table A.</p> | <p>2. How many more earwigs did Maria find than beetles?</p> |
| <p>3. When Maria writes her report, she will list the insects in order of most common to least common. What order should she write in her report?</p> | <p>4. The strength of medicine given to a dog depends on the dog’s weight. There is a different strength for each weight group. For which weight group should a veterinarian order the most medicine? the least medicine?</p> |
| <p>5. Describe the scale and the interval in Table B.</p> | <p>6. How many more dogs are in the most frequent group than in the second most frequent group?</p> |

2-2**Practice: Word Problems****Bar Graphs and Line Graphs**

TREES For Exercises 1, 3, and 4, use Table A. For Exercises 2, 5, and 6, use Table B.

Table A

Average Heights of Pine Trees	
Tree	Height (ft)
Eastern White	75
Lodgepole	48
Longleaf	110
Pitch	55
Ponderosa	140

Table B

Lemons Produced by My Tree	
Year	Number of Lemons
1999	26
2000	124
2001	122
2002	78
2003	55

1. You and Jorge are writing a report on different kinds of pine trees. Make a bar graph for the report that shows the average heights of different kinds of pine trees. Use the data from Table A.

2. Table B shows the number of lemons your tree produced each year. Make a line graph for the data in Table B.

3. Use your graph for Exercise 1. Which tree is about half as tall as a ponderosa?

4. How does the average height of a pitch pine compare to the average height of a lodgepole pine?

5. Use the line graph you made in Exercise 2. Describe the change in fruit production for your lemon tree.

6. FRUIT Suppose you want to make a graph of the total number of lemons produced by your lemon tree and the total number of oranges produced by your orange tree in one year. Would you make a bar graph or a line graph? Explain.

2-3

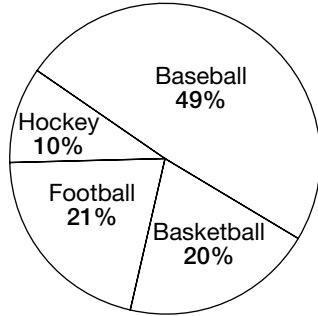
Practice: Word Problems

Circle Graphs

SPORTS For Exercises 1–3, use Graph A. For Exercises 4–6, use Graph B.

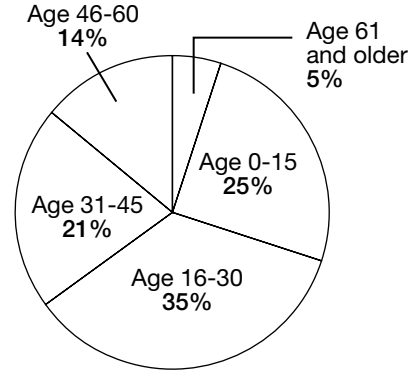
Graph A

Favorite Sports of Mr. Franco's Class



Graph B

Attendance at the Baseball Game



<p>1. Kwan surveyed Mr. Franco’s class to find out the favorite sports of the class. Which sport was the favorite of the largest percent of students in the class? Which sport was the favorite of the smallest percent of students?</p>	<p>2. Which sports were the favorite of about the same number of students?</p>
<p>3. Which sport is the favorite of half as many students as basketball?</p>	<p>4. Mr. Jackson kept track of attendance at the baseball game for an advertising agency. The agency wants to target its advertising to the age group that has the highest percent in attendance. To which group should the agency target ads?</p>
<p>5. Which two age groups have about the same percent of people?</p>	<p>6. Mr. Jackson’s daughter is in the age group with the second highest percent. In which age group is Mr. Jackson’s daughter?</p>

2-4

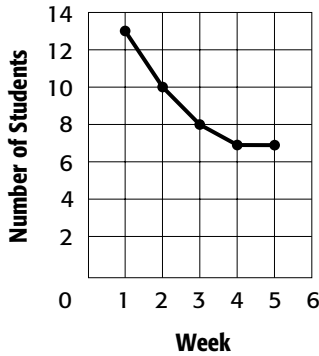
Practice: Word Problems

Making Predictions

FITNESS For Exercises 1–3, use Graph A. For Exercises 4–6, use Graph B.

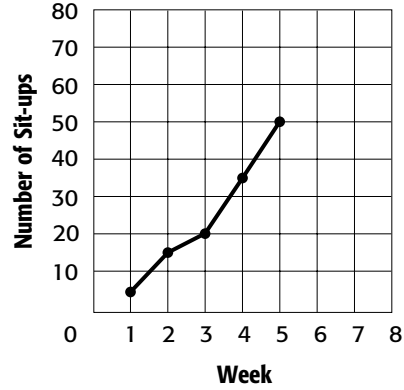
Graph A

Aerobics Class



Graph B

Sit-ups



<p>1. Refer to Graph A. Describe the change in the number of students taking the aerobics class.</p>	<p>2. Predict how many students will be in the aerobics class in week 6 if the trend continues.</p>
<p>3. Predict how many students will be in the aerobics class in week 8.</p>	<p>4. Describe the change in the number of sit-ups Cara can do.</p>
<p>5. Predict how many sit-ups Cara will be able to do in week 6 if the trend continues.</p>	<p>6. Predict the week in which Cara will be able to do 80 sit-ups if the trend continues.</p>

2-5

Practice: Word Problems

Stem-and-Leaf Plots

TRAFFIC For Exercises 1 and 2, use the table. For Exercises 3 and 4, use the stem-and-leaf plot.

Number of Trucks Passing Through the Intersection Each Hour					
5	15	6	42	34	28
19	18	19	22	23	21
32	26	34	19	29	21
10	6	8	40	14	17

Number of Birds at a Watering Hole Each Hour

Stem	Leaf
1	8 9
2	4 8 9
3	3 4 4 4
4	2 5 5 5 5 7 8
5	0 0 3 3 4 6 6 7

$3|4 = 34$ birds

<p>1. Mr. Chin did a traffic survey. He wrote down the number of trucks that passed through an intersection each hour. Make a stem-and-leaf plot of his data.</p>	<p>2. Refer to your stem-and-leaf plot from Exercise 1. Mr. Chin needs to know the range of trucks passing through the intersection in one hour into which the greatest number of hours fall.</p>
<p>3. What is the least number of birds at the watering hole in one hour? What is the greatest number?</p>	<p>4. What is the most frequent number of birds to be at the watering hole in one hour?</p>
<p>5. RVs Make a stem-and-leaf plot for the number of RVs Mr. Chin counted in 12 hours: 3, 4, 9, 13, 7, 9, 8, 5, 4, 6, 1, 11.</p>	<p>6. RVs Write a few sentences that analyze the RV data for Mr. Chin's report in Exercise 5.</p>

2-6**Practice: Word Problems****Mean**

ANIMALS For Exercises 1–3, use the table about bears.

Bear	Average Height (ft)	Average Weight (lb)
Alaskan Brown	8	1,500
Black	6	338
Grizzly	7	588
Polar	7	850

1. You are writing a report on bears. You are analyzing the data on heights and weights in the table above. First look for outliers. Identify the outlier for the height data. Identify the outlier for the weight data.

2. Find the mean of the bear weight data with and without the outlier.

3. Describe how the outlier affects the mean of the bear weight data.

4. WORK Carlos earned \$23, \$29, \$25, \$16, and \$17 working at an ice cream shop after school. What is the mean amount he earned?

5. CARS The cost of a tank of gas at nine different gas stations is shown below. What was the mean cost of a tank of gas?

Cost of Gas: \$17, \$18, \$22, \$15, \$17,
\$16, \$25, \$21, and \$20

6. SCHOOL Sally received scores on math quizzes as shown below. Find her mean score with and without both outliers.

Quiz Scores: 84, 85, 91, 81, 52, 92, 99,
91, and 45

2-7**Practice: Word Problems*****Median, Mode, and Range***

SCIENCE For Exercises 1–3, use Table A. For Exercises 4–6, use Table B. Table A shows the number of days it took for some seeds to germinate after planting. Table B shows how tall the plants were after 60 days.

Table A

Number of Days for Seeds to Germinate				
15	20	30	15	16
9	21	21	15	

Table B

Height (in.) of Plants After 60 Days				
17	19	13	17	20
15	17	21	14	

<p>1. Refer to Table A. You are doing some experiments with germinating seeds. You are preparing a report on your findings to a seed company. What are the mean, median, and mode of the data?</p>	<p>2. Use your answer from Exercise 1. Which measure of central tendency best describes the data? Explain.</p>
<p>3. What is the range of the seed germination data? Describe how the data vary.</p>	<p>4. What are the mean, median, and mode of the plant height data?</p>
<p>5. Refer to your answer in Exercise 4. Which measure of central tendency best describes the data? Explain.</p>	<p>6. What is the range of the plant height data? Describe how the data vary.</p>

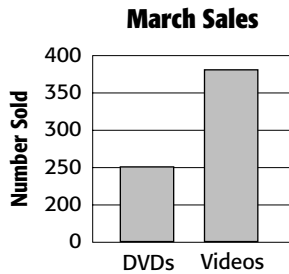
2-8

Practice: Word Problems

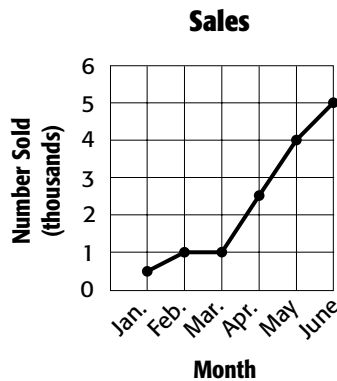
Analyzing Graphs

BUSINESS For Exercises 1 and 2, use Graph A. For Exercises 3 and 4, use Graphs B and C. The graphs show the number of DVDs and videos sold by a video store.

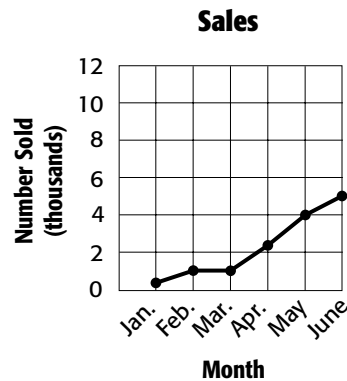
Graph A



Graph B



Graph C



<p>1. About how many times fewer DVDs than videos appear to have been sold?</p>	<p>2. Explain how Graph A is misleading.</p>
<p>3. The graphs show the same data. Which graph appears to show that the number of DVDs and videos sold increased more rapidly? Explain.</p>	<p>4. The store owner is trying to get a loan from the bank and wants to show that business is good. Which graph should the store owner show the bank? Explain.</p>
<p>5. MARKETING A store advertises that it has the lowest average price for T-shirts in town. Find the mean, median, and mode of the prices.</p> <p>T-Shirt Prices: \$14, \$5, \$10, \$12, \$5, \$4, \$13</p>	<p>6. MARKETING Use your answer from Exercise 5. Which measure of central tendency describes the average T-shirt price the most accurately? Explain.</p>

3-1**Practice: Word Problems****Representing Decimals**

BASEBALL For Exercises 1–4, use the table.

The table shows lifetime batting averages for leading baseball players.

Lifetime Batting Averages for Leading Players		
Player	Team	Batting Average
Tony Gwynn	San Diego Padres	0.338
Mike Piazza	New York Mets	0.325
Derek Jeter	New York Yankees	0.320
Vladimir Guerrero	Montreal Expos	0.319
Edgar Martinez	Seattle Mariners	0.319

<p>1. Write Mike Piazza's batting average in word form.</p>	<p>2. Which digit is in the thousandths place of each player's batting average?</p>
<p>3. What is the batting average for the New York Yankees player in expanded form?</p>	<p>4. Which player's average has a 3 in the hundredths place?</p>
<p>5. BUILDING When measuring board footage for some exotic woods, a carpenter must use 1.25 for thickness rather than 1 in her calculations. Write 1.25 in expanded form.</p>	<p>6. TRAVEL The summer camp Jason attends is exactly four hundred twenty-three and four tenths of a mile from his home. Write <i>four hundred twenty-three and four tenths</i> in standard form.</p>

3-2**Practice: Word Problems****Comparing and Ordering Decimals**

MUSIC For Exercises 1–4, use the table.

The table shows the percent of the music market for each type of music.

Music Industry Sales Statistics, 2001	
Type of Music	Percent of Market
Pop	12.1
Country	10.5
Rock	24.4
Rap/Hip-Hop	11.4
R&B	10.6

<p>1. Use $>$ or $<$ to compare the percents for pop and rap/hip-hop. Which is greater?</p>	<p>2. Use $>$ or $<$ to compare the percents for country and R&B. Which is greater?</p>
<p>3. If you owned a store that sells CDs, which kind of music would you want to sell, based on the table? Explain.</p>	<p>4. Suppose children's songs have 12.05 percent of the market. Is this greater or less than the percent for pop music? Explain.</p>
<p>5. CONSTRUCTION Alberto is setting out four boards of lumber. The lengths of the boards are 4.5 feet, 4.52 feet, 4 feet, and 4.505 feet. Order the lengths from longest to shortest.</p>	<p>6. CONSTRUCTION Ella set out a board of pine lumber that was 0.8 feet long and a board of cedar lumber that was 0.80 feet long. Alberto said the cedar board was longer. Is he correct? Explain.</p>

3-3**Practice: Word Problems*****Rounding Decimals***

POPULATION For Exercises 1 and 2, use the table.

The table shows the number of people in the United States per square mile.

U.S. Population	
Year	Number of people per square mile of land area
1970	57.4
1980	64.0
1990	70.3
2000	79.6

<p>1. Round the decimal for the number of people per square mile in 2000 to the nearest tens. Then round it to the nearest ones.</p>	<p>2. Round the decimal for the number of people per square mile in 1970 to the nearest tens. Then round it to the nearest ones.</p>
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EVERGLADES For Exercises 3–7, use the following information.

The Everglades National Park gets an average of 59.10 inches of rainfall a year. It had 1.08025 million visitors in 2001, and its budget for 2003 was \$13.958 million.

<p>3. How much rain does the Everglades National Park receive each year rounded to the nearest inch?</p>	<p>4. How many visitors did the park have rounded to the nearest tenth of a million?</p>
<p>5. How many visitors did the park have rounded to the nearest ten-thousandth of a million?</p>	<p>6. What is the budget to the nearest million?</p>
<p>7. What is the budget to the nearest hundredth of a million?</p>	<p>8. SNOWBOARDING Mike, Jake, and Aaron are buying snowboards. Mike is getting his snowboard on sale for \$219.49. Jake's costs \$279.97. Aaron's costs \$234.95. Round each snowboard price to the nearest dollar.</p>

3-4**Practice: Word Problems*****Estimating Sums and Differences***

SPORTS For Exercises 1–3, use the table.

The table shows the percent of annual hospital visits due to sports injuries by males 15 to 19 years of age.

Percent of Male Sports-Related Injuries in the U.S., 2000–2001			
Sport	Percent	Sport	Percent
Basketball	25.9	Boxing, Wrestling	4.4
Football	21.3	Exercise	3.8
Baseball/softball	4.1	Bicycling	8.1
Soccer	4.6	Skateboarding	3.6

1. Use clustering to estimate the total number of hospital visits due to injuries in baseball/softball, exercising, skateboarding, and boxing.

2. Use rounding to estimate how many more visits were due to football injuries than to soccer injuries.

3. Use front-end estimation to estimate the total number of visits caused by injuries in basketball and skateboarding.

4. **BASKETBALL** Len dribbled a basketball for 43 seconds before Greg got the ball away. Then Greg dribbled the ball for 11.525 seconds before Len got the ball. Use front-end estimation to estimate how many more seconds Len dribbled the ball than Greg.

5. **GARDENING** Kevin is going to plant three new types of vegetables in his garden. The garden store sells packages of tomatillo seeds for \$1.67, chili pepper seeds for \$0.89, and pumpkin seeds for \$2.32. Use rounding to estimate how much Kevin will spend on all three packets of seeds.

6. **TRAVEL** Gloria drove 53.2 miles to her grandmother's home. From her grandmother's home she drove 12.67 miles to her aunt's home. Use front-end estimation to estimate how many miles Gloria drove to get to her aunt's home. Then use rounding to estimate the number of miles again.

3-5**Practice: Word Problems*****Adding and Subtracting Decimals***

<p>1. MICE The average length of the head and body of a western harvest mouse is 2.9 inches. The average length of the tail is 2.8 inches. First, estimate the total length of the mouse. Then find the actual total length.</p>	<p>2. MUSIC A piano solo on a CD is 5.33 minutes long. A guitar solo is 9.67 minutes long. How much longer is the guitar solo than the piano solo? First estimate the difference. Then find the actual difference.</p>
<p>3. WHALES The average length of a humpback whale is 13.7 meters. The average length of a killer whale is 6.85 meters. How much longer is the humpback whale than the killer whale?</p>	<p>4. GARDENING Alan is connecting three garden hoses to make one longer hose. The green hose is 6.25 feet long, the orange hose is 5.755 feet long, and the black hose is 6.5 feet long. First, estimate the total length. Then find the actual total length.</p>
<p>5. ASTRONOMY Distance in space can be measured in astronomical units, or AU. Jupiter is 5.2 AU from the Sun. Pluto is 39.223 AU from the Sun. How much closer to the Sun is Jupiter than Pluto?</p>	<p>6. ALGEBRA It is x miles from James City to Huntley and y miles from Huntley to Grover. How many miles is it from James City to Grover? To find out, evaluate $x + y$ if $x = 4.23$ and $y = 16.876$.</p>

4-1**Practice: Word Problems*****Multiplying Decimals by Whole Numbers***

<p>1. COOKING Norberto uses three 14.7 oz cans of chicken broth when he makes his delicious tortilla soup. How many total ounces of chicken broth does he use?</p>	<p>2. TIME Amanda works on a farm out in the hills. It takes her 2.25 hours to drive to town and back. She usually goes to town twice a week to get supplies. How much time does Amanda spend driving if she takes 8 trips to town each month?</p>
<p>3. EXERCISE The local health club is advertising a special for new members: no initiation fee to join and only \$34.50 per month for the first year. If Andy joins the health club for one year, how much will he spend on membership?</p>	<p>4. BIKING In order to train for a cross-state biking trip, Julie rides her bike 34.75 miles five times a week. How many total miles does she ride each week?</p>
<p>5. MONEY David wants to buy 16 bolts from a bin at the hardware store. Each bolt costs \$0.03. How much will David pay for the bolts?</p>	<p>6. INSECTS One wing of a Royal Moth is 0.75 inch across. How wide is the moth's wingspan when both wings are open?</p>
<p>7. COSTUMES KJ is making costumes for this year's samba parade. The pattern she is using calls for 2.125 yards of fabric for each costume. How many yards of fabric will she need to make 34 costumes?</p>	<p>8. PLANETS Earth is 1.496×10^8 kilometers from the Sun. What is this distance written in standard form?</p>

4-2**Practice: Word Problems*****Multiplying Decimals***

<p>1. GIFTS Colin is filling 4.5 ounce bottles with lavender bubble bath that he made for gifts. He was able to fill 7.5 bottles. How many ounces of bubble bath did he make?</p>	<p>2. GROCERY Iona's favorite peaches are \$2.50 per pound at the local farmers' market. She bought 3.5 pounds of the peaches. How much did she spend?</p>
<p>3. SHOPPING Jennifer is buying new school clothes. The items she wants to buy add up to \$132.50 before sales tax. Sales tax is calculated by multiplying the total amount by 0.08. What is the amount of sales tax for the items?</p>	<p>4. DRIVING Ana bought a van that holds 20.75 gallons of gas and gets an average of 15.5 miles per gallon. How many miles can she expect to go on a full tank?</p>
<p>5. INCOME Ishi makes \$8.50 an hour rolling sushi at Kyoto Japanese Restaurant. His paycheck shows that he worked 20.88 hours over the past two weeks. How much did Ishi make before taxes?</p>	<p>6. TRAVEL Manny is on vacation in France. He rented a car to drive 233.3 kilometers from Paris to Brussels and wants to figure out the distance in miles. To convert from kilometers to miles, he needs to multiply the total kilometers by 0.62. How many miles will Manny drive?</p>

4-3**Practice: Word Problems*****Dividing Decimals by Whole Numbers***

1. ENTERTAINMENT Frank, Gina, Judy, and Connie are splitting their dinner bill. After tip, the total is \$30.08. How much does each owe if they split the bill four ways?

2. FOOD There are 25 servings in a 12.5 ounce bottle of olive oil. How many ounces are in a serving?

3. RUNNING Isabella has found that she stays the most fit by running various distances and terrains throughout the week. On Mondays she runs 2.5 miles, on Tuesdays 4.6 miles, on Thursdays 6.75 miles, and on Saturdays 4.8 miles. What is the average distance Isabella runs on each of the days that she runs? Round to the nearest hundredth of a mile.

4. BUSINESS Katherine spends \$1,089.72 each month for rent and supplies to run her hair salon. If she charges \$18 for a haircut, how many haircuts must Katherine do to cover her monthly expenses? Round to the nearest whole number.

5. CONSTRUCTION It took Steve and his construction crew 8 months to build a house. After expenses, he was left with \$24,872.67 for himself. On average, how much did Steve make per month? Round to the nearest dollar.

6. GRADES Shane wants to figure out what grade he is getting in math. His test scores were 85.6, 78.5, 92.5, 67, and 83.7. What was his average test score? What grade will he receive?

Grade	Average Score
A	90 – 100
B	80 – 89
C	70 – 79
D	60 – 69
F	50 – 59

4-4**Practice: Word Problems*****Dividing by Decimals***

MARATHON For Exercises 1 and 2, use the table that shows course records for the Boston Marathon.

Course Records for the Boston Marathon			
Division	Record-holder	Year	Time (hours)
Men's Open	Cosmas Ndeti	1994	2.121
Women's Open	Margaret Okayo	2002	2.345
Men's Wheelchair	Heinz Frei	1994	1.356
Women's Wheelchair	Jean Driscoll	1994	1.523

<p>1. The Boston Marathon is 26.2 miles. Use the times shown in the table to calculate the miles per hour for each division winner. Round to the nearest thousandth.</p>	<p>2. To the nearest hundredth, how many times greater was the men's open time than the women's wheelchair time?</p>
<p>3. DRIVING The Martinez family drove 48.7 miles to the river. It took them 1.2 hours to get there. How fast did they drive? Round to the nearest whole number.</p>	<p>4. SHOPPING Nikki is buying some refrigerator magnets for her friends. Her total bill is \$16.80. If magnets are \$0.80 each, how many magnets is she buying?</p>
<p>5. SCALE MODEL Matt is making a scale model of a building. The model is 3.4 feet tall. The actual building is 41.48 feet tall. How many times smaller is the model than the actual building?</p>	<p>6. COOKING Yori has 14.25 cups of cupcake batter. If each cupcake uses 0.75 cup of batter, how many cupcakes can Yori make?</p>

4-5**Practice: Word Problems*****Perimeter***

<p>1. GEOGRAPHY The state of Colorado is nearly rectangular. It is about 589 kilometers by 456 kilometers. What is the perimeter of Colorado?</p>	<p>2. FRAMING How many inches of matting is needed to frame an 8.5 inch by 11 inch print?</p>
<p>3. GARDENING Jessica wants to put a fence around her 10.5 foot by 13.75 foot rectangular garden. How many feet of fencing will she need?</p>	<p>4. SEWING Amy is making pillows to decorate her bed. She is going to make three square pillows that are each 2 feet by 2 feet. She wants to use the same trim around each pillow. How many feet of trim will she need for all three pillows?</p>
<p>5. JOGGING Before soccer practice, Jovan warms up by jogging around a soccer field that is 100 yards by 130 yards. How many yards does he jog if he goes around the field four times?</p>	<p>6. POSTER Ted is making a stop sign poster for a talk on safety to a first grade class. He will put a strip of black paper around the perimeter of the stop sign. Each of the stop sign's eight sides is 16.34 inches. How long a strip of paper will he need?</p>
<p>7. FLAG Jo is making a triangular banner. Each of the three sides is 14.567 inches long. If she puts a braided trim around the banner, how much trim will she need?</p>	<p>8. PYRAMIDS The Great Pyramid at Giza, Egypt, has a square base, with each side measuring 0.229 kilometer. If you could walk once all the way around the pyramid at its base, how far could you walk?</p>

4-6**Practice: Word Problems*****Circumference***

AUDIO MEDIA For Exercises 1–3, use the table that shows the sizes of three main audio media: vinyl, CD, and mini-disc. Use 3.14 for π .

Diameters of Audio Media	
Medium	Diameter (inches)
Vinyl Disc	12
Compact Disc (CD)	5
Mini Compact Disc (Mini-disc)	2.5

1. What is the circumference of a CD?	2. When a record player needle is placed on the outside edge of a vinyl record, how far does the needle travel in one rotation?
3. What is the difference between the circumference of a vinyl disc and a mini-disc?	4. CROP CIRCLES On June 8, 1992 a crop circle with an 18-meter radius was found in a wheat field near Szekesfehervar, 43 miles southwest of Budapest. What was its circumference?
5. SEQUOIAS The largest living thing in the world is the General Sherman sequoia in Sequoia National Park, California. It is 272 feet high, has a diameter of 36.5 feet, and has an estimated weight of 2,150 tons. What is the sequoia's circumference to the nearest tenth of a foot?	6. MONSTER TRUCKS A monster truck fleet uses 23 degree tires 66 inches tall, 43 inches wide, mounted on 25-inch diameter wheels. What is the circumference of a monster truck wheel to the nearest tenth of an inch?

5-1**Practice: Word Problems****Greatest Common Factor**

<p>1. WAREHOUSE A warehouse has three shelves that can hold 8, 12, or 16 skateboards. Each shelf has sections holding the same number of skateboards. What is the greatest number of skateboards that can be put in a section? Explain.</p>	<p>2. FRUIT Mei has 15 oranges, 9 peaches, and 18 pears. She wants to put all of the fruit into decorative baskets. Each basket must have the same number of pieces of fruit in it. Without mixing fruits, what is the greatest number of pieces of fruit Mei can put in each basket? Explain.</p>						
<p>3. SHIPPING Oscar needs to ship 14 rock CDs, 12 classical CDs, and 8 pop CDs. He can pack only one type of CD in each box, and he must pack the same number of CDs in each box. What is the greatest number of CDs Oscar can pack in each box? Explain.</p>	<p>4. GARDENING Jill wants to put 45 sunflower plants, 81 corn plants, and 63 tomato plants in her garden. If she puts the same number of plants in each row and if each row has only one type of plant, what is the greatest number of plants Jill can put in one row? Explain.</p>						
<p>5. MONEY The list shows the amounts of money the club leader collected from members for a camping trip. Each member paid the same amount. What is the most the camping trip could cost per member? Explain.</p> <table border="1" data-bbox="548 1388 837 1524"> <tbody> <tr> <td>Wednesday</td> <td>\$36</td> </tr> <tr> <td>Thursday</td> <td>\$54</td> </tr> <tr> <td>Friday</td> <td>\$72</td> </tr> </tbody> </table>	Wednesday	\$36	Thursday	\$54	Friday	\$72	<p>6. MONEY Use the information from Exercise 5. How many members have paid to go on the camping trip if the price is the greatest possible price per member?</p>
Wednesday	\$36						
Thursday	\$54						
Friday	\$72						

5-2**Practice: Word Problems*****Simplifying Fractions***

For Exercises 1–3, use the following information and the table at the right. Write your answers in simplest form.

In a frequency table, the relative frequency of a category is the fraction of the data that falls in that class.

To find relative frequency, divide the frequency by the total number of items.

Eye Color Survey		
Color	Tally	Frequency
Brown		12
Blue		5
Green		4
Hazel		8
Violet		1

<p>1. STATISTICS What is the relative frequency of people with brown eyes?</p>	<p>2. STATISTICS What is the relative frequency of people with hazel eyes?</p>
<p>3. STATISTICS What is the relative frequency of people with brown or hazel eyes?</p>	<p>4. ANIMALS Lions sleep about 20 hours a day. Write $\frac{20}{24}$ as a fraction in simplest form.</p>
<p>5. MARBLES Carlota has 63 marbles. Twenty-eight of her marbles are aggies. What fraction of Carlota's marbles are aggies? Write the answer in simplest form.</p>	<p>6. MOVIES Fourteen of the top thirty all-time grossing children's films were animated films. Write $\frac{14}{30}$ as a fraction in simplest form.</p>

5-3**Practice: Word Problems*****Mixed Numbers and Improper Fractions***

<p>1. MILEAGE Brownsville is $7\frac{5}{8}$ miles away from Frisco. Write the distance as an improper fraction.</p>	<p>2. SWIMMING Steven swam $\frac{47}{6}$ meters crossing Lady Jay Creek. Write the distance he swam as a mixed number.</p>
<p>3. FOOD Kenji's favorite recipe calls for $3\frac{3}{4}$ cups of flour. Write the amount of flour he needs as an improper fraction.</p>	<p>4. PUPPY Nikki's puppy weighs $\frac{25}{7}$ pounds. Write the puppy's weight as a mixed number.</p>
<p>5. EXERCISE Koto can run $4\frac{7}{10}$ miles before she is too tired to keep going. Write the distance she can run as an improper fraction.</p>	<p>6. GEOGRAPHY Hampshire Hill is $\frac{87}{9}$ meters tall. Write its height as a mixed number.</p>

5-4**Practice: Word Problems*****Least Common Multiple***

1. FORESTRY Omar is planting trees. He has enough trees to plant 6, 7, or 14 trees in each row. What is the least number of trees Omar could have?

2. BUSES The Line A bus arrives at the bus stop every 25 minutes, and the Line B bus arrives every 15 minutes. They are both at the bus stop right now. In how many minutes will they both be at the bus stop again?

3. MARCHING BAND The high school marching band rehearses with either 6 or 10 members in every line. What is the least number of people that can be in the marching band?

4. TIME In a clock, a large gear completes a rotation every 45 seconds, and a small gear completes a rotation every 18 seconds. How many seconds pass before the gears align again?

5. ROSES Dante is planting his rose garden. He knows he can plant all of his roses by planting 12 or 15 rose bushes in every row. What is the least number of rose bushes Dante could have?

6. FAMILY Every 7 years the Lancaster family has a family reunion. Every 6 years they update their family tree. If they both had a photo taken and updated their family tree in 1997, in what year will both events occur again?

5-5**Practice: Word Problems****Comparing and Ordering Fractions**

<p>1. SHOES Toya is looking in her closet. If $\frac{1}{3}$ of her shoes are black and $\frac{2}{5}$ are brown, does she have more black shoes or more brown shoes? Explain.</p>	<p>2. BUDGET Daniel spends $\frac{3}{7}$ of his money on rent and $\frac{4}{9}$ of his money on food. Does he spend more money on food or rent? Explain.</p>
<p>3. WOODWORKING Isi drilled a hole that is $\frac{5}{9}$ inch wide. She has a screw that is $\frac{5}{6}$ inch wide. Is the hole wide enough to fit the screw? Explain.</p>	<p>4. FOOD In a recent survey, $\frac{2}{5}$ of the people surveyed said their favorite food was pizza, $\frac{1}{4}$ said it was hot dogs, and $\frac{3}{10}$ said it was popcorn. Which food was favored by the greatest number of people? Explain.</p>
<p>5. OFFICE SUPPLIES A blue paper clip is $\frac{1}{6}$ inch wide. A silver paper clip is $\frac{3}{8}$ inch wide, and a red paper clip is $\frac{1}{3}$ inch wide. What color paper clip has the smallest width? Explain.</p>	<p>6. GUMBALLS A red gumball is $\frac{5}{8}$ inch across. A green gumball is $\frac{5}{6}$ inch across, and a blue gumball is $\frac{7}{9}$ inch across. List the gumballs in order from smallest to largest.</p>

5-6**Practice: Word Problems*****Writing Decimals as Fractions***

1. FIELD TRIP About 0.4 of a biology class will be going on a field trip. Write the decimal as a fraction in simplest form.

2. EARTH Eighty percent of all life on Earth is below the ocean's surface. Write 0.80 as a fraction in simplest form.

3. VENUS The planet Venus is 67.24 million miles away from the Sun. Write the decimal as a mixed number in simplest form.

4. SATURN If you weighed 138 pounds on Earth, you would weigh 128.34 pounds on Saturn. Write the weight on Saturn as a mixed number in simplest form.

5. MERCURY If you were 10 years old on Earth, you would be 41.494 years old on Mercury. Write the age on Mercury as a mixed number in simplest form.

6. INTERNET According to recent figures, 4.65 million people in the Middle East are online. Write the decimal as a mixed number in simplest form.

5-7**Practice: Word Problems****Writing Fractions as Decimals**

<p>1. PLANETS The planet Mercury is roughly $\frac{2}{5}$ the size of Earth. Write the fraction as a decimal.</p>	<p>2. MARBLES Lin has a marble that is $\frac{5}{8}$ inch wide. Write the marble's width as a decimal.</p>
<p>3. HOMEWORK Miko has finished $\frac{6}{11}$ of her homework. Write the fraction as a decimal.</p>	<p>4. EXERCISE Tate has been dancing for $\frac{5}{6}$ of an hour. Write this fraction as a decimal.</p>
<p>5. SPORTS Charlie played tennis for $3\frac{3}{4}$ hours. Write the mixed number as a decimal.</p>	<p>6. COOKING A recipe calls for $2\frac{2}{3}$ cups of milk. Write the mixed number as a decimal.</p>
<p>7. HEIGHT Winona is $2\frac{4}{11}$ the height of her little brother. Write the mixed number as a decimal.</p>	<p>8. RECESS Jennifer has been spinning in circles for $4\frac{3}{16}$ minutes. Write the mixed number as a decimal.</p>

6-1**Practice: Word Problems*****Rounding Fractions and Mixed Numbers***

<p>1. EXERCISE Judy walked $6\frac{5}{8}$ miles. To the nearest half mile, how many miles did she walk?</p>	<p>2. ANIMALS Maria's hamster weighs $3\frac{4}{9}$ pounds. How many pounds is this to the nearest half pound?</p>
<p>3. TRAVEL It is $9\frac{7}{10}$ miles from the library to the school. How many miles is this to the nearest half mile?</p>	<p>4. CARPENTRY Jan has cut a board to make a shelf. The board is $3\frac{2}{7}$ feet long. How many feet is this to the nearest half foot?</p>
<p>5. LUMBERING Pat needs to haul away $1\frac{3}{8}$ tons of wood from the lot. The maximum weight his pickup truck is supposed to carry is 1 ton. How many trips should Pat make to haul all the wood away? Explain.</p>	<p>6. CLOTHING Mandy is making table place mats that will take $2\frac{1}{4}$ yards of cloth. If cloth is sold in half yards, how many yards of cloth will Mandy need to buy? Explain.</p>
<p>7. EXERCISE Julien is preparing for a 5-mile race. He can choose from a $4\frac{7}{8}$-mile course to train on or a $5\frac{2}{5}$-mile course. Which course should he choose? Explain.</p>	<p>8. CRAFTS Marisa wants to glue her $6\frac{1}{4}$-inch by $8\frac{4}{5}$-inch painting onto foam backing. The foam backing comes in sheets that are 6 inches by 9 inches or 7 inches by 9 inches. Which sheet of foam should Marisa buy? Explain.</p>

6-2**Practice: Word Problems*****Estimating Sums and Differences***

CLOTHING For Exercises 1–4, use the table. It shows articles of clothing and the yardage of cloth needed to make them.

Amount of Cloth Needed to Make Clothing	
Article of Clothing	Amount of Cloth (yards)
Bandana	$\frac{1}{3}$
Vest	$\frac{7}{8}$
Pants	$4\frac{1}{5}$
Shirt	$3\frac{3}{8}$
Jacket	$6\frac{4}{9}$

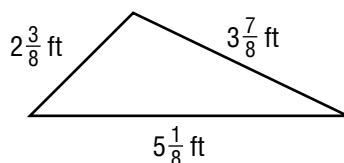
1. Jan wants to make a bandana and a vest from the same cloth. About how many yards of cloth will she need?

2. About how much more cloth will a vest need than a bandana?

3. Gloria wants to make pants and a matching shirt from the same cloth. About how much cloth will she need?

4. Sam is trying to decide whether to make a jacket or a shirt. About how much more cloth would he need to buy for a jacket than for a shirt?

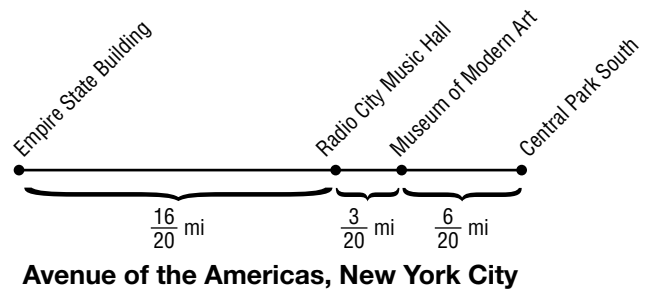
5. **GARDENING** Juan is building a fence around a triangular garden. About how much fencing should he buy to be sure he has enough?



6. **GARDENING** Refer to the drawing in Exercise 5. About how much longer is the longest side of the garden than the shortest side, to the nearest whole number?

6-3**Practice: Word Problems****Adding and Subtracting Fractions with Like Denominators**

MAPS For Exercises 1–3, use the drawing at the right that shows distances between major sites on the Avenue of the Americas in New York City.



<p>1. Carla walked from the Empire State Building to the Museum of Modern Art. How far did she walk?</p>	<p>2. Julie walked from Central Park South to the Museum of Modern Art. Jolene walked from Radio City Music Hall to the Museum. How much farther did Julie walk than Jolene?</p>
<p>3. Dion walked from Central Park South to the Empire State Building. How far did he walk?</p>	<p>4. COOKING Tiffany made a glass of punch from fruit juice concentrate. She used $\frac{1}{4}$ cup concentrate and $\frac{3}{4}$ cup water. How much more water than concentrate did Tiffany use?</p>
<p>5. ART Beng is creating a painting. He has $\frac{5}{8}$ of a tube of red paint and $\frac{3}{8}$ of a tube of green paint. How much more red paint does he have than green paint?</p>	<p>6. CONSTRUCTION Mr. Hayashi is repairing his sidewalk. He mixed $\frac{5}{9}$ pound of cement with sand and water to make concrete. The next day he mixed $\frac{7}{9}$ pound of cement with sand and water. How many pounds of cement altogether did Mr. Hayashi use?</p>

6-4**Practice: Word Problems*****Adding and Subtracting Fractions with Unlike Denominators***

BUSINESS For Exercises 1–4, use the table below. It lists the fractions of United States car sales held by several companies in 2001.

Leading Car Sales in U.S. in 2001	
Company	Fraction of Sales
Company A	$\frac{1}{5}$
Company B	$\frac{4}{25}$
Company C	$\frac{2}{5}$
Company D	$\frac{3}{20}$

<p>1. What fraction of the U.S. sales did Company C and Company B hold together?</p>	<p>2. How much greater was the fraction of the market of Company A than of Company D?</p>
<p>3. How much more than Company A's fraction of the market did Company C have?</p>	<p>4. Find the total fraction of the market that Company D and Company B hold together.</p>
<p>5. TRAVEL Gabriella's travel shampoo bottle holds $\frac{1}{2}$ cup of shampoo. Before leaving on vacation, she filled the bottle to the top with $\frac{1}{8}$ cup of shampoo. How much shampoo was already in the bottle?</p>	<p>6. EXERCISE Bill and Andy were racing to see who could run the farthest in 5 minutes. Bill ran $\frac{5}{8}$ of a mile, and Andy ran $\frac{3}{4}$ of a mile. How much farther did Andy run than Bill?</p>

6-5**Practice: Word Problems*****Adding and Subtracting Mixed Numbers***

Solve. Write answers in simplest form.

<p>1. SCHOOL Liwanu spent $2\frac{2}{5}$ hours on his math homework and $1\frac{3}{5}$ hours on his science homework. How much time did he spend doing math and science homework?</p>	<p>2. FARMING Mr. Garcia planted $4\frac{7}{8}$ acres of wheat and $1\frac{5}{8}$ acres of corn. How much more wheat did he plant than corn?</p>
<p>3. COOKING Trey wants to make biscuits and muffins. He needs $2\frac{1}{4}$ cups of flour for the biscuits and $1\frac{5}{8}$ cups of flour for the muffins. How much flour does Trey need altogether?</p>	<p>4. COOKING Gina wants to make cookies. The recipe for blueberry muffins calls for $2\frac{3}{4}$ cups of flour. The recipe for cornmeal muffins calls for $1\frac{1}{3}$ cups of flour. How many more cups of flour would Gina need for blueberry muffins than corn muffins?</p>
<p>5. WEIGHT Crystal's baby brother weighed $7\frac{1}{2}$ pounds at birth. After one month, her brother weighed $8\frac{4}{5}$ pounds. How much weight did the baby gain?</p>	<p>6. BOOKS Kyle read $3\frac{5}{6}$ books and Jan read $2\frac{1}{3}$ books. How many more books did Kyle read than Jan?</p>
<p>7. ANIMALS The average length of a Rufous hummingbird is $3\frac{1}{2}$ inches. The average length of a Broad-tailed hummingbird is $4\frac{1}{2}$ inches. How much shorter is the Rufous hummingbird?</p>	<p>8. RECYCLING The class collected $9\frac{5}{7}$ pounds of glass bottles and $6\frac{1}{2}$ pounds of aluminum cans. How many pounds of glass and aluminum did the class collect in all?</p>

6-6**Practice: Word Problems*****Subtracting Mixed Numbers with Renaming***

Solve. Write in simplest form.

<p>1. EXERCISE Seth has already walked $\frac{5}{8}$ miles. It takes $1\frac{3}{8}$ miles to get to school. How much further does he have to go?</p>	<p>2. COOKING Aviva needs fresh lemon juice to make cheesecake. She bought 2 lemons but needed only $1\frac{1}{4}$ lemons for the amount of juice she needs. How much lemon does she have left over?</p>
<p>3. WORK In 2000, 17 million workdays were lost due to strikes and labor disputes. In 2001, there were only $1\frac{1}{5}$ million days lost. How many more workdays were lost in 2000?</p>	<p>4. TRAVEL It usually takes Amalie $1\frac{3}{4}$ hours to get to her aunt's house. Due to Thanksgiving traffic, this year it took $3\frac{1}{3}$ hours. How much longer did it take this year?</p>
<p>5. CARS A 2002 SUV can accelerate from 0 to 60 mph in $10\frac{59}{100}$ seconds. A sports car takes $9\frac{86}{100}$ seconds to get from 0 to 60 mph. How much faster does the sports car get to 60 mph?</p>	<p>6. SCULPTURE Jose has $8\frac{1}{2}$ cups of Plaster of Paris powder. If Jose uses $5\frac{3}{5}$ cups for a sculpture, how much plaster will he have left?</p>

7-1**Practice: Word Problems*****Estimating Products***

Estimate by using rounding or compatible numbers. Show how you found your estimates.

FOOD For Exercises 1–3, use the table. The table lists the grams of saturated fat per tablespoon of some common fats.

Grams of Saturated Fat per Tablespoon	
Safflower Oil	$\frac{4}{5}$
Olive Oil	$1\frac{4}{5}$
Butter	$7\frac{1}{5}$
Cream Cheese	$3\frac{1}{5}$

<p>1. Jenny is making muffins. The recipe calls for 4 tablespoons of oil. If she uses safflower oil, about how many grams of saturated fat would she be adding to the muffin batter?</p>	<p>2. Curtis spread 2 tablespoons of butter on his slice of bread. About how many grams of saturated fat did Curtis add to the slice of bread?</p>
<p>3. Rubin is fond of bagels and cream cheese. He spread $5\frac{2}{3}$ tablespoons of cream cheese on his bagel and ate the bagel. About how many grams of saturated fat did Rubin eat by eating the cream cheese?</p>	<p>4. WATER Marcia is making a habit of drinking at least 7 cups of water a day. About how many cups of water did she drink if she drank $\frac{3}{4}$ the number of cups she wanted to drink?</p>
<p>5. TRAVEL Seth has been driving for $4\frac{3}{4}$ hours at 62 miles per hour. About how many miles has he driven?</p>	<p>6. MAIL The U.S. Postal Service delivers about 199 billion pieces of mail each year. Of this mail, $\frac{4}{5}$ is sent by big commercial users. About how many pieces of mail are sent by big commercial users each year?</p>

7-2**Practice: Word Problems*****Multiplying Fractions***

COOKING For Exercises 1 and 2, use the recipe for chocolate frosting.

Chocolate Frosting Recipe

$\frac{1}{3}$ cup butter

2 ounces melted unsweetened chocolate

2 cups powdered sugar

$\frac{1}{2}$ teaspoon vanilla

2 tablespoons milk

<p>1. Georgia wants to cut the recipe for chocolate frosting in half for a small cake that she's making. How much of each ingredient will she need?</p>	<p>2. Suppose Georgia wanted to double the recipe; what would the measurements be for each ingredient?</p>
<p>3. COMPUTERS $\frac{1}{5}$ of today's college students began using computers between the ages of 5 and 8. If a college has 3,500 students, how many of the students began using computers between the ages of 5 and 8?</p>	<p>4. EXERCISE A paper published in a medical journal reported that about $\frac{11}{25}$ of girls ages 16 to 17 do not exercise at all. The entire study consisted of about 2,500 girls. About how many did not exercise?</p>
<p>5. ANIMALS Catherine walks her dog $\frac{3}{4}$ mile every day. How far does she walk each week?</p>	<p>6. MUSIC If you practice a musical instrument each day for $\frac{2}{3}$ of an hour, how many hours of practice would you get in each week?</p>

7-3**Practice: Word Problems*****Multiplying Mixed Numbers***

FOOD For Exercises 1–3, use the table. The table shows Keith’s food options for a 7-day outdoor survival course.

Food Options for 7-day Outdoor Survival Course	
peanut butter	1 plastic jar = $4\frac{3}{5}$ cups
dried noodles/rice	$14\frac{2}{3}$ cups
dried fruit/nuts	$6\frac{1}{6}$ cups
concentrated juice boxes	8 boxes = $16\frac{1}{4}$ cups
beef jerky	$3\frac{1}{3}$ cups
powdered milk	1 box = $8\frac{4}{5}$ cups
dehydrated soup	5 packages = $15\frac{2}{3}$ cups
canned tuna/meat	4 cans = $5\frac{3}{5}$ cups

<p>1. Keith wants to divide his tuna over the seven-day course. How many cups of tuna meat can Keith plan on consuming each day?</p>	<p>2. Keith would like to bring enough concentrated juice in order to have $2\frac{1}{4}$ cups available per day. How much juice does he need and is 8 boxes of concentrated juice enough?</p>
<p>3. Six other students have been advised to bring the same menu on the course. How many cups of dried fruits and nuts will the students be bringing all together?</p>	<p>4. MEASUREMENT Bill wants to put a large mural on a wall that is $9\frac{1}{3}$ feet long and $8\frac{1}{8}$ feet wide. Find the area of the wall. If the mural is 100 square feet, will it fit on the wall?</p>
<p>5. PAINTING Pam is mixing $3\frac{1}{5}$ batches of paint. If one batch calls for $2\frac{3}{4}$ tablespoons of detergent to add to the tempera powder, how many tablespoons of detergent will Pam need?</p>	<p>6. COOKING To make a batch of fruit punch, Steve needs $2\frac{2}{3}$ cups blackberry juice. If he wants to make $2\frac{3}{4}$ batches of punch, how many cups of blackberry juice will he need?</p>

7-4**Practice: Word Problems*****Dividing Fractions***

<p>1. PIZZA Norberto has $\frac{9}{10}$ of a pizza. The pizza will be divided equally among 6 people. How much will each person get?</p>	<p>2. CARPENTRY Laura wants to cut a board into three equal pieces. The board is $\frac{5}{8}$ feet long. How long will each piece be?</p>
<p>3. PETS Errol uses $\frac{1}{3}$ can of wet dog food for his dog, Muddy, each day. How many servings will he get from 5 cans of dog food?</p>	<p>4. ICE CREAM Julia ate $\frac{1}{2}$ pint of mint chocolate chip ice cream. Mark ate $\frac{3}{4}$ pint of malt ice cream. How many times more ice cream did Mark eat?</p>
<p>5. GARDENING Talia wants to give away 6 bundles of rosemary from her herb garden. If she has $\frac{1}{2}$ pound of rosemary, how much will each bundle weigh?</p>	<p>6. SCHOOL Kirsten has $\frac{3}{4}$ hour left to finish 5 math problems on the test. How much time does she have to spend on each problem?</p>
<p>7. FOOD Joe has $\frac{1}{2}$ of a cake he would like to split among 3 people. What part of the cake will each person get?</p>	<p>8. INTERNET $\frac{3}{4}$ of college students use the Internet more than the library. $\frac{9}{100}$ use the library more. How many times more students use the Internet?</p>

7-5**Practice: Word Problems****Dividing Mixed Numbers**

<p>1. VIDEOTAPES Lyle is putting his videotapes on a shelf. The shelf is 12 inches long. If each videotape is $1\frac{1}{2}$ inches wide, how many videotapes can he put side-by-side on the shelf?</p>	<p>2. FOOD DeLila has $4\frac{1}{2}$ pies to divide equally among 9 people. How much will each person get?</p>
<p>3. GARDENING Maurice mows lawns on Saturday. Last week it took him $5\frac{1}{2}$ hours to finish. This week it took only 5 hours. How many times longer did it take last week than this week?</p>	<p>4. COOKING Chris is cutting a roll of cookie dough into pieces that are $\frac{1}{2}$ inch thick. If the roll is $10\frac{1}{2}$ inches long, how many pieces can he make?</p>
<p>5. SPORTS Tanya Streeter holds the world record for free-diving in the ocean. She dove 525 feet in $3\frac{1}{2}$ minutes. How many feet per minute did she dive?</p>	<p>6. GARDENING Catherine got $9\frac{3}{8}$ pounds of cherries from her tree this year. Last year she only got $6\frac{1}{4}$ pounds. How many times more pounds did she get this year than last year?</p>
<p>7. SEWING Jeanne has $3\frac{3}{5}$ yards of fabric. She needs $1\frac{4}{5}$ yards to make a pair of pants. How many pairs of pants can she make?</p>	<p>8. EXERCISE Del Ray can run $20\frac{1}{2}$ miles in $2\frac{1}{4}$ hours. How many miles per hour can he run?</p>

7-6**Practice: Word Problems****Sequences**

<p>1. SPORTS Thomas is getting in shape for track. He is starting with a 2 mile run and will increase the run by $\frac{1}{2}$ mile each week for 4 weeks. What will his distance be for the second, third, and fourth weeks?</p>	<p>2. WATER Kevin is pumping water from a small pond into a water tank. At 9 A.M. the water level was 2 inches. At 11 A.M. it was $3\frac{1}{2}$ inches. At 1 P.M. it was 5 inches. If the pattern continues, what will the level be at 3 P.M.? Explain.</p>
<p>3. BACKPACKING A group of backpackers started with 5 pounds of cheese. On the second day they had only $2\frac{1}{2}$ pounds. On the third day they had $1\frac{1}{4}$ pounds. If the pattern continues, how much will they have on the fourth day? Explain.</p>	<p>4. FROGS The frog population in a Japanese garden is growing at an alarming rate. The counts taken show there were 14 frogs to start, then 28, then 56, then 112. If they continue to grow at this rate, what will the next count be? Explain.</p>
<p>5. MONEY James borrowed \$315 from his parents for a snowboard. He agreed to pay them back in monthly payments. In February he owed \$265. In March he owed \$215. In April he owed \$165. What are his monthly payments? How much will he owe in August?</p>	<p>6. TRAVEL Jessica is on a road trip. At noon she still had 372 miles to go. At 1 P.M. she had 307 miles to go. At 2 P.M. she had 242 miles to go. At this rate, how many miles will Jessica have left to go at 5 P.M.? Explain.</p>

8-1**Practice: Word Problems****Integers**

<p>1. MONEY Katryn owes her father \$25. Write this number as an integer.</p>	<p>2. GEOGRAPHY Mt. Whitney in California is 14,494 feet above sea level. Write this number as an integer.</p>										
<p>3. GEOGRAPHY Badwater in Death Valley is 282 feet below sea level. Write this number as an integer.</p>	<p>4. SCHOOL Dick forgot to put his name on his homework. His teacher deducts 5 points for papers turned in without names on them. So, Dick lost 5 points from his score. Write this number as an integer.</p>										
<p>5. GEOGRAPHY Multnomah Falls in Oregon drops 620 feet from the top to the bottom. Suppose a log is carried by the water from the top to the bottom of the falls. Write the integer to describe the location of the log now.</p>	<p>6. TRAVEL The train left the station and traveled ahead on the tracks for 30 miles. Write an integer to describe the new location of the train from the station.</p>										
<p>7. WEATHER The table shows the average normal January temperature of four cities in Alaska. Compare the temperatures of Barrow and Fairbanks, using $<$, $>$, or $=$. Then compare the temperatures of Barrow and Anchorage.</p> <table border="1" data-bbox="302 1646 777 1854"> <thead> <tr> <th>City</th> <th>Temperature (°F)</th> </tr> </thead> <tbody> <tr> <td>Anchorage</td> <td>15</td> </tr> <tr> <td>Barrow</td> <td>-13</td> </tr> <tr> <td>Fairbanks</td> <td>-10</td> </tr> <tr> <td>Juneau</td> <td>24</td> </tr> </tbody> </table>	City	Temperature (°F)	Anchorage	15	Barrow	-13	Fairbanks	-10	Juneau	24	<p>8. WEATHER Use the table from Exercise 7. Write the temperatures of the four cities in order from highest to lowest temperature.</p>
City	Temperature (°F)										
Anchorage	15										
Barrow	-13										
Fairbanks	-10										
Juneau	24										

8-2**Practice: Word Problems*****Adding Integers***

<p>1. GAME To play a game on a game board, Drew puts his game piece on START. On his first turn, he moves his game piece ahead 7 spaces. On his second turn, Drew moves his game piece back 4 spaces. How many spaces away from START is his game piece now?</p>	<p>2. GAME Frita’s game piece is on square 24 of a game board. She draws a card that says, “Move back 4 spaces.” Then she draws a card that says, “Move back 2 spaces.” On which square is Frita’s game piece now?</p>
<p>3. WEATHER The temperature outside is 0°F. If the temperature drops 14° overnight, what was the overnight low temperature?</p>	<p>4. WEATHER The temperature outside is -16°F. Then the temperature rises 20 degrees. What is the current outdoor temperature?</p>
<p>5. ANIMALS An ant crawls 14 centimeters down into an ant hole. It then crawls 6 centimeters up to the queen’s nest. Write and solve an addition sentence that gives the location of the ant.</p>	<p>6. ANIMALS Monarch butterflies travel an average of about 15 feet off the ground. One butterfly flies to a height of 22 feet. Tell how much higher it flies than average.</p>
<p>7. ANIMALS Pacific salmon swimming up the Columbia River travel 2 feet under water. Suppose one salmon darts 3 feet up and out of the water. How far out of the water did the salmon jump?</p>	<p>8. ANIMALS Plankton (microscopic animals) float on the top of a pond at night to feed. They drop to the bottom of the pond during the day. Express their daytime location as a negative number if the top of the pond is at sea level and the pond is 4 feet deep.</p>

8-3**Practice: Word Problems****Subtracting Integers**

MONEY For Exercises 1–4, use the transaction register.

A transaction register is used to record money deposits and withdrawals from a checking account. It shows how much money Mandy, a college student, had in her account as well as the 4 checks she has written so far.

Check No.	Date	Description of Transaction	Payment	Deposit	Balance
	9/04	spending money from parents		\$500	\$500
1	9/07	college bookstore — textbooks	\$291		
2	9/13	graphing calculator	\$99		
3	9/16	bus pass	\$150		
4	9/24	Charlie's Pizza	\$12		

<p>1. Subtract each withdrawal to find the balance after each check was written. If Mandy spends more than \$500, record that amount as a negative number.</p>	<p>2. Which check did Mandy write that made her account overdrawn?</p>
<p>3. Mandy called home and asked for a loan. Her parents let her borrow \$500. What is her balance now?</p>	<p>4. After her parents let her borrow the \$500 from Exercise 3, Mandy wants to spend \$300 on clothes and \$150 on decorations for her dorm room. Does she have enough money in the bank? Express her balance with an integer if she buys these items.</p>
<p>5. WEATHER At 2 P.M., the temperature was -9°F. If the temperature drops 20 degrees, what is the new temperature?</p>	<p>6. BASKETBALL During a high school basketball game, the home team scored 51 points and the opponents scored 62 points. What is the point differential (the difference between the number of points scored by a team and its opponent) for the home team?</p>

8-4**Practice: Word Problems*****Multiplying Integers***

<p>1. BASKETBALL A basketball player who makes a basket scores 2 points for her team. Tanya made 9 baskets in the game. Write a number sentence to show many points she scored for her team.</p>	<p>2. HEALTH Jim was recovering in the shade from a walk in the hot desert. His temperature dropped 2°F each hour for 2 hours. What was the total change in his temperature?</p>
<p>3. WEATHER The outside temperature is -3°F and falling at a rate of 2 degrees per hour. What will the temperature be in 5 hours?</p>	<p>4. POPULATION A small town is losing residents at a rate of 24 residents per year. If this pattern continues for 5 years, what will be the change in relation to the original population?</p>
<p>5. SCIENCE A pebble falls into a pond. From the surface, it descends at a rate of 2 feet per second. Where is the pebble in relation to the surface of the pond after 5 seconds?</p>	<p>6. CONSTRUCTION A construction company is starting to excavate a hole for a new underground parking garage. If the company excavates 3 feet every hour for 4 hours, what will be the depth of the hole in relation to the surface?</p>
<p>7. WEATHER The outside temperature is -20°F and rising at a rate of 5 degrees per hour. How long will it be before the temperature reaches 0°F?</p>	<p>8. SCIENCE For each kilometer above Earth's surface, the temperature decreases 7°C. If the temperature at Earth's surface is -8°, what will be the temperature 7 kilometers above the surface?</p>

8-5**Practice: Word Problems*****Dividing Integers***

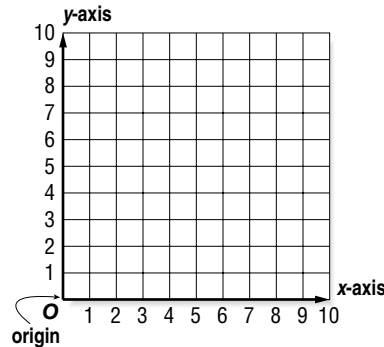
<p>1. SKATING Judges in some figure skating competitions must give a mandatory 5-point deduction for each jump missed during the technical part of the competition. Marisa has participated in 5 competitions this year and has been given a total of -20 points for jumps missed. How many jumps did she miss?</p>	<p>2. SKATING Miranda is an excellent spinner who averages $+3$ points on her spins during competitions. Last year her total spin points equaled $+21$. About how many spins did she successfully complete?</p>
<p>3. WEATHER The temperature dropped 32°F in 4 hours. Suppose the temperature dropped by an equal amount each hour. What integer describes the change?</p>	<p>4. SKATING Dan's scores for speed this season are $-1, -3, 1, -1, -2, 0$. What is his average speed score for the season? (<i>Hint:</i> The average is the sum of the points divided by the number of scores.)</p>
<p>5. FOOTBALL A football team was penalized 30 points in 3 plays. Suppose the team was penalized an equal number of yards on each play. Write an integer that gives the yards for each penalty.</p>	<p>6. BASKETBALL A team scored a total of 27 points for three-point field goals in the season. How many 3-point field goals did they make?</p>
<p>7. TRACK Anna and Sara both ran 5 laps of a race. When Anna finished, Sara was 15 meters behind Anna. Suppose Sara fell behind the same number of meters during each lap. Write an integer that describes how far Sara fell behind in each lap.</p>	<p>8. BAKING Maria was penalized a total of 12 points in 6 baking contests for not starting on time. Suppose she was penalized an equal number of points at each competition. Write an integer that describes the penalty during each contest.</p>

8-6**Practice: Word Problems****The Coordinate Plane**

MONEY For Exercises 1–4, use the table and the coordinate plane.

School buttons sell for \$2 each. When you have completed the table and the graph, both the table and graph will show the costs of purchasing up to 5 school buttons.

Number of Buttons Sold	Price (\$)
1	
2	
3	
4	
5	



<p>1. Now complete the second column of the table by writing the cost of each number of buttons.</p>	<p>2. To prepare to graph the data, make a list of ordered pairs from the table.</p>
<p>3. Graph the ordered pairs. Label each point with its ordered pair. Describe the graph of the points.</p>	<p>4. Describe the coordinate plane that you have completed. How is it different from other systems you have used?</p>
<p>5. TRACK If it takes Trixie 8 minutes to run a mile, then $8m$ represents her total time where m is the number of miles she has run. List the ordered pairs (number of miles, total time) for 0, 1, 2, and 3 miles.</p>	<p>6. TRACK If you were to graph the ordered pairs from Exercise 5, what would their graph look like?</p>

9-1**Practice: Word Problems*****Properties***

<p>1. HOMEWORK Jacy spends half an hour every night studying math and an hour every night studying science. Over five days, how much time does Jacy spend on his homework? Write two expressions you can use to find the answer. Then answer the question.</p>	<p>2. COMPUTER GAMES In Carlota's computer game, she goes up one level every time she earns 210 points. Carlota has just gone up a level for the eighth time. Use the Distributive Property to calculate mentally how many points Carlota has.</p>
<p>3. ENROLLMENT The sixth grade class at Parkview Middle School has 25 blondes, 18 redheads, and 25 brunettes. Use mental math to figure out how many students are in the sixth grade.</p>	<p>4. GYM CLASS In gym class, students were put into groups. Each group had 4 boys and 3 girls. If 7 groups were formed, how many students were in the class?</p>
<p>5. SPORTS CARS Every day for 11 days, Tylia saw 23 sports cars pass her bedroom window. Write a numerical expression to describe how many sports cars she saw in all. Rewrite the expression using the Distributive Property so that you can mentally calculate how many sports cars she saw.</p>	<p>6. MARBLES Devon has 16 blue marbles, 22 green marbles, and 14 red marbles in a bag. Write a numerical expression to describe the total number of marbles in the bag in the order given in the problem. Then rewrite the expression to make it easier to mentally calculate how many marbles are in the bag.</p>
<p>7. BOWLING It costs \$5.75 per person for one game of bowling and \$2.25 to rent one pair of shoes. What does it cost for five friends to go bowling? Write two different numerical expressions to describe the cost for five friends. Then use one to calculate the total cost for five friends.</p>	<p>8. GIFTS Ms. Bautista made 22 gift baskets for her students. Each basket had 5 apples and 3 oranges. How many pieces of fruit did Ms. Bautista use?</p>

9-2**Practice: Word Problems*****Solving Addition Equations***

<p>1. BIRTHDAYS Alberto's birthday is 7 days after Corey's birthday. Alberto's birthday is on the 9th. Write and solve an equation to find the day of Corey's birthday.</p>	<p>2. AGE Megan and Jason are brother and sister. Jason is 4 years older than Megan. If Jason is 16 years old, write and solve an equation to find Megan's age.</p>
<p>3. PAPER AIRPLANES Rebecca and Ricardo are both testing their paper airplanes. Rebecca's plane flew 6 feet further than Ricardo's plane. If Rebecca's plane flew 10 feet, write and solve an equation to find how far Ricardo's plane flew.</p>	<p>4. BASEBALL CARDS Ren and Chet have just started collecting baseball cards. Ren has 13 more baseball cards than Chet. Ren has 27 cards. Write and solve an equation to find how many baseball cards Chet has.</p>
<p>5. SKATING Susan and Ruby went skating. Ruby skated 30 minutes longer than Susan. If Ruby skated for 45 minutes, write and solve an equation to find how long Susan skated.</p>	<p>6. STUNT FLYER A stunt airplane is flying at 150 feet. It ascends to 325 feet. Write and solve an equation to find the change in altitude of the airplane.</p>
<p>7. SAVINGS Oscar is saving money to buy a jacket that costs \$47. He has already saved \$25. Write and solve an equation to find how much more money Oscar needs to save.</p>	<p>8. RECYCLING Bonnie has 27 more cans than Jackie. If she has 56 cans, write and solve an equation to find how many cans Jackie has.</p>

9-3**Practice: Word Problems*****Solving Subtraction Equations***

<p>1. BIRDS A house cat, Sophie, scared away 5 birds when she arrived on the porch. If 3 birds remain, write and solve an equation to find how many birds were on the porch before Sophie arrived.</p>	<p>2. APPLES David brought apples to school one day. After giving one to each of his 5 closest friends, David had 6 apples left. Write and solve an equation to find how many apples David brought to school.</p>
<p>3. BASKETBALL The basketball team is practicing after school. Four students have to leave early. If 12 basketball players remain, write and solve an equation to find how many students are on the basketball team.</p>	<p>4. MARBLES Virginia's mother gave her marbles for her birthday. Virginia lost 13 of them. If she has 24 marbles left, write and solve an equation to find how many her mother gave her.</p>
<p>5. MONEY Claudio went for a walk. While he was walking, \$1.35 fell out of his pocket. When he returned home, he counted his money and had \$2.55 left. Write and solve an equation to find how much money was in Claudio's pocket when he started his walk.</p>	<p>6. HANG GLIDING Aida was hang gliding. After losing 35 feet in altitude, she was gliding at 125 feet. Write and solve an equation to find her height when she started hang gliding.</p>
<p>7. SHARKS The average great hammerhead shark is 11.5 feet long. The average great hammerhead shark is 13.5 feet shorter than the average whale shark. Write and solve an equation to find the length of the average whale shark.</p>	<p>8. JOKES At a party, Tex told 17 fewer knock-knock jokes than he did riddles. If he told 23 knock-knock jokes, write and solve an equation to find how many riddles Tex told at the party.</p>

9-4**Practice: Word Problems*****Solving Multiplication Equations***

<p>1. BAND SOLO Kai's solo in the next school band performance is 4 times as long as Dena's solo. Kai's solo is 12 minutes long. Write and solve an equation to find the length of Dena's solo.</p>	<p>2. CATS Steve's tabby cat eats 5 times as often as his black cat. The tabby cat ate 10 times yesterday. Write and solve an equation to find how many times the black cat ate.</p>
<p>3. FOOTBALL In last night's football game, the home team earned 3 times as many points as the visiting team. They won the game with 21 points. Write and solve an equation to find how many points the visiting team had.</p>	<p>4. MONEY Paz has 3 times as much money in her wallet as in her pocket. There is \$18 in her wallet. Write and solve an equation to find how much money is in her pocket.</p>
<p>5. MORNINGS It takes Jun 3 times as long as it takes Kendra to get ready in the morning. It takes Jun 45 minutes to get ready. Write and solve an equation to find how long it takes Kendra.</p>	<p>6. FISH In his home aquarium, Enli has 12 times as many guppies as he has goldfish. Enli just counted 72 guppies. Write and solve an equation to find how many goldfish he has.</p>
<p>7. MUSIC Ray's favorite song is 2 times longer than Meli's favorite song. Write and solve an equation to find the length of Meli's favorite song if Ray's lasts 6 minutes.</p>	<p>8. TRAILS The forest trail to Round Lake is 3 times longer than the rocky trail to Round Lake. The forest trail is 15 miles long. Write and solve an equation to find the length of the rocky trail.</p>

9-5**Practice: Word Problems*****Solving Two-Step Equations***

<p>1. FIRE TRUCKS Fire Station A has one more than twice as many fire trucks as Fire Station B. If Fire Station A has three fire trucks, write and solve an equation to find how many fire trucks Fire Station B has.</p>	<p>2. TOY CARS Tanisha has 7 less than 4 times as many toy cars as Fernando. If Tanisha has 9 cars, write and solve an equation to find how many toy cars Fernando has.</p>
<p>3. ADDRESS Danielle and Erin live on the same street. Danielle lives at number 13. If Danielle's house number is 5 less than 3 times Erin's house number, write and solve an equation to find Erin's house number.</p>	<p>4. BIRTHDAY CAKE Mrs. Zeng is slicing her son's birthday cake. To make sure everyone will have enough, she slices the cake so that the number of slices is 6 more than twice the number of people at the party. If she slices the cake into 20 slices, write and solve an equation to find how many people are at the party.</p>
<p>5. DINOSAURS The largest complete dinosaur we know of was a Brachiosaurus. It reached a length of 23 meters. Its length was one less than twice its height. Write and solve an equation to find the height of the Brachiosaurus.</p>	<p>6. BABY-SITTING Last week, Enrique earned \$30.00 baby-sitting. Enrique earned \$5.00 less than 7 times what Rhea earned. Write and solve an equation to find how much money Rhea earned baby-sitting last week.</p>
<p>7. ELECTION Raj received 8 more than 3 times as many votes as Vinny in a school election. Raj received 44 votes. Write and solve an equation to find how many votes Vinny received.</p>	<p>8. JACK-O-LANTERN It took Suki 127 minutes from start to finish to carve her pumpkin. Carving the pumpkin took her 13 fewer minutes than 10 times as long as it took her to pick the pumpkin out at the pumpkin patch. Write and solve an equation to find how long it took Suki to pick out her pumpkin.</p>

9-6**Practice: Word Problems****Functions**

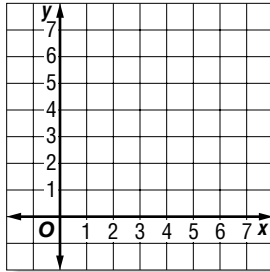
<p>1. DRAGONS The Luck Dragons that live in the Enchanted Forest weigh $4x$ pounds when they are x years old. Write a function table that can be used to find the weights of 6-year old, 8-year old, and 10-year old Luck Dragons.</p>	<p>2. ROLLER COASTER Twelve people are able to ride the Serpent of Fire roller coaster at one time. Write a function table that shows the total number of people that have been on the roller coaster after 1, 2, 3, and 4 rides.</p>
<p>3. MOVIES At the local movie theater it costs \$10.00 for 2 students to see a movie. It costs \$15.00 for 3 students, and it costs \$20.00 for 4 students. Let the number of students be the input. What is the function rule that relates the number of students to the cost of tickets?</p>	<p>4. HOMEWORK At Elmwood Middle School, sixth graders spend 1 hour every night doing homework. Seventh graders spend 2 hours, and eighth graders spend 3 hours. Let the students' grade be the input. What is the function rule between the students' grade and the amount of time the students spend on homework every night?</p>
<p>5. BEADS A bead shop sells wooden beads for \$3 each and glass beads for \$7 each. Write a function rule to represent the total selling price of wooden (w) and glass (g) beads.</p>	<p>6. Use the function rule in Exercise 5 to find the selling price of 20 wooden beads and 4 glass beads.</p>

9-7

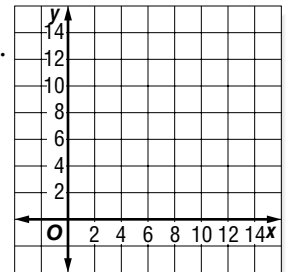
Practice: Word Problems

Graphing Functions

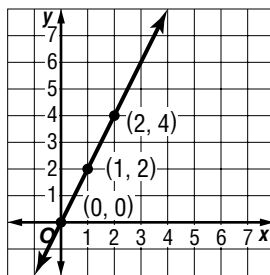
1. LIBRARY Tia visited the library 3 times. The first time, she spent 1 hour and checked out 4 books. Then she spent 2 hours and checked out 5 books. On her last visit, she spent 3 hours and checked out 6 books. Let the number of hours be the input and the number of books be the output. Graph the function.



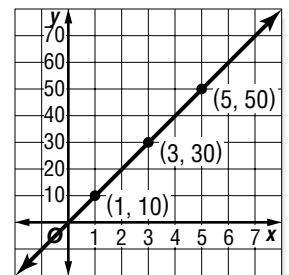
2. CD RACK A CD rack fits 3 CDs across. When one shelf is full, the shelf has 3 CDs on it. When two shelves are full, it has 6 CDs, and when three shelves are full it has 9 CDs. Let the number of full shelves be the input and the number of CDs be the output. Graph the function.



3. TELEPHONE Althea made a graph of how many friends call her after school. She let the number of hours that passed be the input and the number of people who called be the output. Look at her graph and determine the function rule.

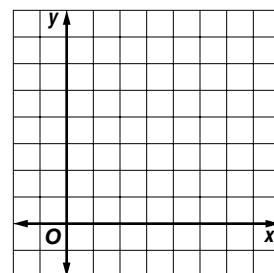


4. DOLPHINS The more dolphins Toni uses in the dolphin show, the more people attend the show. She let the number of dolphins be the input and the number of attendees be the output, and made a graph of the function. Look at her graph and determine the function rule.



5. BOTANY Jessie planted a bean plant that was 2 inches tall. Each day it grew 1 inch. Tanya planted a bean plant that was 1 inch tall. It grew 2 inches per day. Write the function rule for each bean plant.

6. BOTANY Graph each function from Exercise 5 on the same coordinate plane. What does the intersection of the two graphs represent?



10-1**Practice: Word Problems****Ratios**

<p>1. FOOTBALL In the NFL 2001–2002 season, the Miami Dolphins won 11 games and the Oakland Raiders won 10 games. What is the ratio of wins for the Dolphins to wins for the Raiders?</p>	<p>2. GARDENING Rod has 10 rosebushes, 2 of which produce yellow roses. Write the ratio <i>2 yellow rosebushes out of 10 rosebushes</i> in simplest form.</p>
<p>3. TENNIS Nancy and Lisa played 20 sets of tennis. Nancy won 12 of them. Write the ratio of Nancy's wins to the total number of sets in simplest form.</p>	<p>4. AGES Oscar is 16 years old and his sister Julia is 12 years old. What will be the ratio of Oscar's age to Julia's age in 2 years? Write as a fraction in simplest form.</p>
<p>5. MOVIES Four friends paid a total of \$32 for movie tickets. What is the ratio <i>\$32 for 4 people</i> written as a unit rate?</p>	<p>6. WORKING At a warehouse, the employees can unload 18 trucks in 6 hours. What is the unit rate for unloading trucks?</p>
<p>7. ANIMALS A reindeer can run 96 miles in 3 hours. At this rate, how far can a reindeer run in 1 hour? Explain.</p>	<p>8. SHOPPING Jenny wants to buy cereal that comes in large and small boxes. The 32-ounce box costs \$4.16, and the 14-ounce box costs \$2.38. Which box is less expensive per ounce? Explain.</p>

10-2**Practice: Word Problems*****Solving Proportions***

<p>1. SCHOOL The ratio of boys to girls in history class is 4 to 5. How many girls are in the class if there are 12 boys in the class? Explain.</p>	<p>2. FACTORIES A factory produces 6 motorcycles in 9 hours. Write a proportion and solve it to find how many hours it takes to produce 16 motorcycles.</p>
<p>3. READING James read 4 pages in a book in 6 minutes. How long would you expect him to take to read 6 pages?</p>	<p>4. COOKING A recipe that will make 3 pies calls for 7 cups of flour. Write a proportion and solve it to find how many pies can be made with 28 cups of flour.</p>
<p>5. TYPING Sara can type 90 words in 4 minutes. About how many words would you expect her to type in 10 minutes?</p>	<p>6. BASKETBALL The Lakewood Wildcats won 5 of their first 7 games this year. There are 28 games in the season. About how many games would you expect the Wildcats to win this season? Explain your reasoning.</p>
<p>7. FOOD Two slices of Dan's Famous Pizza have 230 Calories. How many Calories would you expect to be in 5 slices of the same pizza?</p>	<p>8. SHOPPING Andy paid \$1.40 for 4 grapefruits. Write a proportion and solve it to find how many grapefruits he can purchase for \$2.10.</p>

10-3**Practice: Word Problems****Scale Drawings and Models**

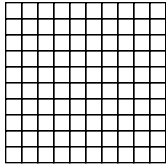
<p>1. MAPS On a map with a scale of 1 inch = 9 miles, the distance between two towns is 3 inches. What is the actual distance between the two towns?</p>	<p>2. BLUEPRINTS On an architect's blueprint, the front of a building measures 27 inches. The scale of the blueprint is 1 inch = 2 feet. How wide will the front of the actual building be?</p>
<p>3. MODELS The model of an airplane has a wingspan of 20 inches. The model has a scale of 1 inch = 4 feet. What is the wingspan of the actual airplane?</p>	<p>4. ARCHITECTURE The drawing for a building has a scale of 1 inch = 3 feet. The building in the drawing has a height of 14 inches. How tall will the actual building be?</p>
<p>5. ROCKETS A model of the Saturn V rocket has a scale of 1 inch = 12 feet. If the model rocket is 30 inches tall, how tall was the actual Saturn V rocket?</p>	<p>6. CARS Ron took a photograph of his car and then measured the length of the car in the photograph. The length was $4\frac{1}{2}$ inches. If the scale of the photograph is 1 inch = 4 feet, how long is Ron's actual car?</p>
<p>7. MODELS A model of a 4-cylinder gasoline engine is built on a scale of 1 inch = 6 inches. If the length of the model engine is 9 inches, how long is the actual engine?</p>	<p>8. PHOTOGRAPHY A photo lab technician is going to reduce a photograph that is 9 inches wide using a scale of 1 inch = $\frac{2}{3}$ inch. How wide will the reduced photo be?</p>

10-4

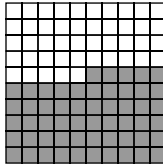
Practice: Word Problems

Modeling Percents

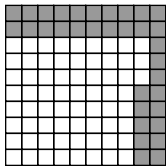
1. FOOTBALL In the 2001–2002 season, the Dallas Cowboys football team won 45% of their games. Make a model to show 45%.



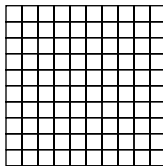
2. LANDSCAPING Jacob is making a 10 foot by 10 foot patio in his backyard using paving stones that are 1 foot square. The shaded area of the model indicates the finished part of the patio. What percent of the patio has Jacob finished?



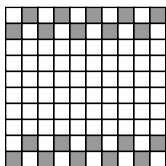
3. ART Lydia is making a collage using 100 photographs arranged in a square pattern. The shaded area in the model indicates the part of the collage already covered by photos. What percent of the collage is finished?



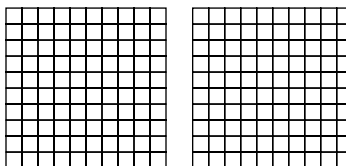
4. ENERGY In the year 2000, nuclear energy accounted for 8% of the energy used in the U.S. Make a model to show 8%.



5. GAMES The figure shows the starting position for a game played on a 10 by 10 board. The shaded squares contain game pieces. What percent of the squares on the board contain game pieces?



6. MUSIC In the school chorus, 52% of the girls sing soprano and 44% sing alto. Which of these two sections of the chorus has more girls? Explain using models.



10-5**Practice: Word Problems*****Percents and Fractions***

<p>1. TOYS The Titanic Toy Company has a 4% return rate on its products. Write this percent as a fraction in simplest form.</p>	<p>2. MUSIC There are 4 trombones out of 25 instruments in the Landers town band. What percent of the instruments are trombones?</p>
<p>3. SHOPPING Alicia's favorite clothing store is having a 30% off sale. What fraction represents the 30% off sale?</p>	<p>4. FOOD At Ben's Burger Palace, 45% of the customers order large soft drinks. What fraction of the customers order large soft drinks?</p>
<p>5. BASKETBALL In the 2001–2002 NBA season, Shaquille O'Neal of the Los Angeles Lakers made 60% of his field goals. What fraction of his field goals did Shaquille make?</p>	<p>6. SCHOOL In Janie's class, 7 out of 25 students have blue eyes. What percent of the class has blue eyes?</p>
<p>7. TESTS Michael answered $\frac{17}{20}$ questions correctly on his test. What percent of the questions did Michael answer correctly?</p>	<p>8. RESTAURANTS On Saturday afternoon, $\frac{41}{50}$ telephone calls taken at The Overlook restaurant were for dinner reservations. What percent of the telephone calls were for dinner reservations?</p>

10-6**Practice: Word Problems*****Percents and Decimals***

<p>1. COMMUTING According to the 2000 U.S. census, 76% of U.S. workers commute to work by driving alone. Write 76% as a decimal.</p>	<p>2. BASEBALL Barry Bonds's batting average for the 2002 season was 0.370. Write 0.370 as a percent.</p>
<p>3. ELECTIONS In the 2002 U.S. midterm elections, 39% of eligible adults voted. What is 39% written as a decimal?</p>	<p>4. BASKETBALL In the 2001–2002 season, Jason Kidd of the New Jersey Nets had a field goal average of 0.391. What is 0.391 written as a percent?</p>
<p>5. SPORTS When asked to choose their favorite sport, 27% of U.S. adults who follow sports selected professional football. What decimal is equivalent to 27%?</p>	<p>6. AGE Lawrence is 18 years old and his brother Luther is 12 years old. This means that Lawrence is 1.5 times older than Luther. What percent is equivalent to 1.5?</p>
<p>7. WATER About 5% of the surface area of the U.S. is water. What decimal represents the amount of the U.S. surface area taken up by water?</p>	<p>8. POPULATION China accounts for 0.207 of the world's population. What percent of the world's population lives in China?</p>

10-7**Practice: Word Problems*****Percent of a Number***

<p>1. SCHOOL There are 520 students at Northridge High School. 80% of these students take the bus. How many students take the bus?</p>	<p>2. AGE Theresa is 60% as old as her sister Mala, who is 20 years old. How old is Theresa?</p>
<p>3. TIPPING Charlie wants to leave a 15% tip for a meal that costs \$40. How much should Charlie leave for a tip?</p>	<p>4. SALES TAX Charmaine wants to buy a shirt for \$15. If the sales tax is 4% of \$15, how much will she pay in sales tax?</p>
<p>5. FOOTBALL In the 2001–2002 regular season, the Green Bay Packers won 75% of their games. There were 16 regular season games. How many games did Green Bay win?</p>	<p>6. BASEBALL During the 2002 World Series, Rich Aurilia of the San Francisco Giants had a batting average of 250 or 25%. He was at bat 32 times. How many hits did he get?</p>
<p>7. RUNNING Thomas finished the race in 120 minutes. James took 95.5% as long as Thomas to finish the race. How long did it take James to finish the race?</p>	<p>8. SHOPPING A DVD player that normally costs \$160 is on sale for 70% of its normal price. What is the sale price of the DVD player?</p>

10-8**Practice: Word Problems*****Estimating with Percents***

<p>1. SCHOOL At Westside High School, 24% of the 225 sixth grade students walk to school. About how many of the sixth grade students walk to school?</p>	<p>2. BASKETBALL In the 2002 regular season the WNBA Cleveland Rockers won 31.25% of their games. They had 32 games in their regular season. About how many games did they win?</p>
<p>3. SALES TAX The sales tax rate in Lacon is 9%. About how much tax would you pay on an item that costs \$61?</p>	<p>4. SPORTS The concession stand at a football game served 178 customers. Of those, about 52% bought a hot dog. About how many customers bought a hot dog?</p>
<p>5. READING Max has completed 39% of his reading assignment. If there are 303 pages in the assignment, about how many pages has Max read?</p>	<p>6. SHOPPING A store is having a 20% sale. That means the customer pays 80% of the regular price. About how much would you pay for an item that regularly sells for \$44.99?</p>
<p>7. SLEEP A recent study shows that people spend about 31% of their time asleep. About how much time will a person spend asleep during an average 78 year lifetime?</p>	<p>8. BIOLOGY The human body is 72% water, on average. About how much water will be in a person that weighs 138 pounds?</p>

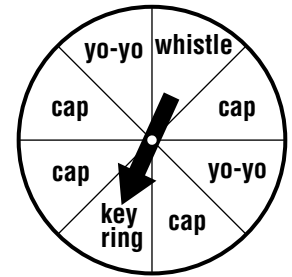
11-1

Practice: Word Problems

Theoretical Probability

Write each answer as a fraction, a decimal, and a percent.

PARTY For Exercises 1 and 2, the spinner shown is spun once. The spinner shows the prizes a person can win at a party.



<p>1. What is the probability that a person will spin a cap? a whistle? a cap or yo-yo?</p>	<p>2. What is the probability that a person will spin a stuffed animal? Explain. What is the probability that a person will win a prize?</p>
<p>3. WEATHER The weather report says there is an 85% chance it will be very hot tomorrow. Should you get ready to use the air conditioner? Explain.</p>	<p>4. EATING HABITS 7% of Americans are vegetarians. If you ask a random person whether he or she is a vegetarian, what is the probability that the person is <i>not</i> a vegetarian? Explain.</p>
<p>5. SCHOOL Theresa is taking a multiple-choice test and does not know an answer. She can guess answer A, B, C, D, or E. What is the probability that Theresa will guess correctly? incorrectly?</p>	<p>6. NUMBER CUBE You roll a number cube. How likely is it that you will roll a number less than 1? less than 7? Explain.</p>
<p>7. FOOD Mrs. Phillips has 10 identical cans without labels. She knows that she had 1 can of peas, 5 cans of corn, 1 can of carrots, and 3 cans of beets. She opens one can. What is the probability it is carrots? corn or beets?</p>	<p>8. In Exercise 7, how likely is it Mrs. Phillips will open a can of corn? a can of peas? Explain.</p>

11-2**Practice: Word Problems****Outcomes**

<p>1. OUTINGS Olivia and Candace are deciding between Italian or Chinese food and then whether to go to a movie, walk in the park, or go for a bike ride. Draw a tree diagram to show the sample space. How many choices do they have?</p>	<p>2. PETS Terence is going to get a parrot. He can choose among a yellow, green, or multi-colored female or male parrot. Draw a tree diagram showing all the ways Terence can choose. What is the probability he will choose a yellow female?</p>
<p>3. CAKE Julia is ordering a birthday cake. She can have a circular or rectangular chocolate or vanilla cake with chocolate, vanilla, or maple frosting. Draw a tree diagram showing all the possible ways Julia can order her cake. How many options does she have?</p>	<p>4. GAMES Todd plays a game in which you toss a coin and roll a number cube. Draw a tree diagram to find all possible outcomes. What is $P(\text{heads, odd number})$?</p>
<p>5. SCHOOL Melissa can choose two classes. Her choices are wood shop, painting, chorus, and auto shop. List all the ways two classes can be chosen.</p>	<p>6. SHOPPING Kaya has enough allowance to purchase two new baseball caps from the five he likes. How many ways can he choose?</p>

11-3

Practice: Word Problems

Making Predictions

MOVIES For Exercises 1–3, use the table of results of Jeremy’s survey of favorite kinds of movies.

Favorite Movie Type	
Type	People
Drama	12
Foreign	3
Comedy	20
Action	15

SLEEP For Exercises 4–7, use the table of results of the Better Sleep Council’s survey of Americans to find the most important factors for good sleep.

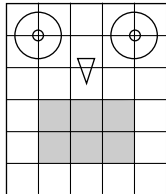
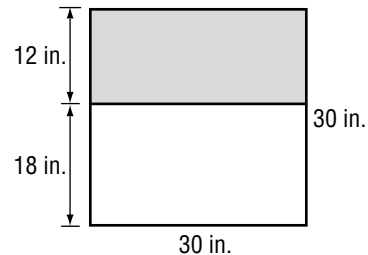
Most Important Factors for Good Sleep	
Good Mattress	32
Daily Exercise	20
Good Pillows	8
Healthy Diet	11
Other Factors	29

- | | |
|--|---|
| <p>1. MOVIES How many people did Jeremy use for his sample?</p> | <p>2. If Jeremy were to ask any person to name his or her favorite type of movie, what is the probability that it would be comedy?</p> |
| <p>3. If Jeremy were to survey 250 people, how many would you predict would name comedy?</p> | <p>4. SLEEP Predict how many people out of 400 would say that a good mattress is the most important factor.</p> |
| <p>5. What is the probability that any person chosen at random would not say that a healthy diet is the most important factor?</p> | <p>6. Suppose 250 people were chosen at random. Predict the number of people that would say good pillows are the most important factor.</p> |
| <p>7. What is the probability that any person chosen at random would say that daily exercise is the most important factor for a good night sleep?</p> | <p>8. ICE CREAM Claudia went to an ice cream shop to conduct a survey. She asked every tenth person who entered the shop to name his or her favorite dessert. Did Claudia select a good sample? Explain.</p> |

11-4**Practice: Word Problems****Probability and Area**

GAMES For Exercises 1–5, use the following information and the game boards below.

Game Board 1 is for a beanbag toss game in which you are blindfolded and toss a beanbag at the board. The game board shows a bird's head with eyes, beak, and a hole for a mouth. Game Board 2 is for a dart game in which you randomly throw a dart at the board.

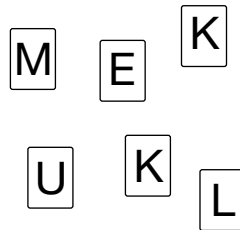
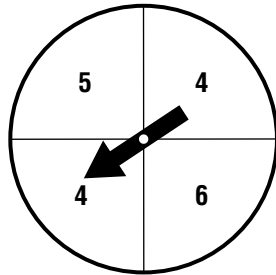
Game Board 1**Game Board 2**

<p>1. Refer to Game Board 1. The shaded region represents the mouth hole. Dawn will randomly throw a beanbag at the board. What is the probability that the beanbag will go into the mouth hole? What is the probability that the beanbag will not go into the mouth hole?</p>	<p>2. Use your answer from Exercise 1. Predict how many beanbags will go into the mouth hole if Dawn throws 20 beanbags. Explain.</p>
<p>3. Use your answer from Exercise 1. Predict how many beanbags will not go into the mouth hole if Dawn throws 40 beanbags.</p>	<p>4. Refer to Game Board 2. Pam will randomly throw a dart at the dartboard. What is the probability that her dart will land in the shaded region? Explain.</p>
<p>5. Use your answer from Exercise 4. Predict the number of darts that will land in the shaded area if Pam randomly throws 60 darts.</p>	<p>6. SKYDIVING A skydiver is dropped from a plane above a field that is 35 yards by 16 yards. In the center is a region of sand that is 7 yards by 7 yards. What is the probability that the skydiver will land in the sandy region?</p>

11-5**Practice: Word Problems*****Probability of Independent Events***

GAMES For Exercises 1–3, use the spinner and the letter cards and the following information.

Brad is playing a game with his little sister in which you spin the spinner and randomly choose a letter card. The spinner tells how many words you must name that begin with the letter on the letter card you choose.



<p>1. What is the probability of spinning an even number and choosing a vowel?</p>	<p>2. What is the probability of spinning an even number and a consonant? Explain.</p>
<p>3. Find $P(\text{even and M})$. What are the possible numbers of words beginning with M that Brad or his sister will have to name?</p>	<p>4. WEATHER The probability of snow on Monday is 0.2. The probability of snow on Tuesday is 0.4. What is the probability that it will snow on both days?</p>
<p>5. GAMES Stephen is playing a game with two coins. In order to score points, both coins must land on heads or both must land on tails. What is the probability that Stephen will score points on one toss?</p>	<p>6. FOOD A bakery sells muffins and beverages. The beverages are coffee, tea, orange juice, and milk. There are five kinds of muffins. If a customer chose a beverage and a muffin at random, what is the probability the customer would choose a milk and a blueberry muffin?</p>

12-1**Practice: Word Problems*****Length in the Customary System***

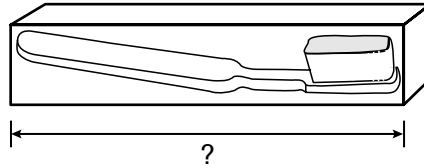
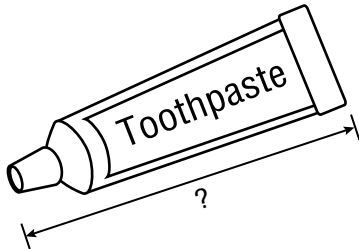
<p>1. WOODWORKING Anthony is building a toolbox with length 2 feet, width $1\frac{1}{2}$ feet, and height 3 feet. What are the dimensions of Anthony's box in inches?</p>	<p>2. TRIATHLON Julie is training for a small triathlon where she will run 3 miles, bike 10 miles, and swim 150 yards. How many yards will Julie run? How many feet will she swim?</p>
<p>3. WEATHER Raquel and her family are moving from Portland, Oregon, to Seattle, Washington. She is comparing annual rainfall to prepare for her move. Portland's annual rainfall is $3\frac{1}{12}$ feet. Seattle's annual rainfall is 37 inches. Which city gets more rain?</p>	<p>4. SEWING Abe needs 13.5 feet of fabric to make a bedspread. How many yards does he need?</p>
<p>5. TRAVEL On her trip to New York City, Celia read that the famous Woolworth building was built in 1913 and stands 792 feet tall. How high is the building in yards?</p>	<p>6. FOOTBALL The length of a football field is 100 yards. How many feet is that? How many inches?</p>
<p>7. SCHOOL Krista lives $\frac{1}{2}$ mile from school. Desiree lives 872 yards away from school. Who lives closer? Explain.</p>	<p>8. CRAFTS David is making a pattern for the mouth of a puppet. The mouth will be a rectangle of red felt fabric. The rectangle will be $\frac{3}{8}$ inch wide and $2\frac{1}{4}$ inches long. Draw a pattern for David.</p>

12-2**Practice: Word Problems*****Capacity and Weight in the Customary System***

<p>1. COOKING Sylvia is making a pot of stew that needs 1 quart of beef broth. How many cups of beef broth does she need?</p>	<p>2. CANDY Wade works at the candy shop. He wrapped 56 pieces of fudge to sell. How many total pounds of fudge did he wrap if each piece weighed 1 ounce?</p>
<p>3. TRUCKS Shauna's truck can handle up to 2 tons of weight. She wants to haul 3,500 pounds of wood. How many tons of wood is that? Can she haul all of it at once?</p>	<p>4. GIFTS Jason made 34 bottles of flavored olive oil to give to his class. How many pints of flavored olive oil did Jason make if each bottle holds 8 fluid ounces?</p>
<p>5. CIDER Mary bought five gallons of apple cider for her birthday party. She expects 20 guests. How many cups of cider will each guest get?</p>	<p>6. PETS Pam has a 4-pound bag of dry cat food. Every day she puts out 4 ounces of dry cat food for her cat. For how many days will the bag of cat food be enough to feed her cat? Explain.</p>
<p>7. LUNCH Suzie fills a 1-pint thermos with milk each day for lunch. How many times will she be able to fill her thermos with $\frac{1}{2}$ gallon of milk? Explain how you found your answer.</p>	<p>8. COOKING James is making a quart of won ton soup using canned chicken broth. A can of chicken broth holds 14 fluid ounces. How many cans will James need to buy? Explain how you found your answer.</p>

12-3**Practice: Word Problems*****Length in the Metric System***

TRAVEL For Exercises 1 and 2, use the figures below.



<p>1. Gabe is going on a trip to San Diego. He is taking a tube of toothpaste and a toothbrush holder. How long is the tube of toothpaste in centimeters and in millimeters?</p>	<p>2. How long is the toothbrush holder in centimeters and in millimeters?</p>
<p>3. SWIMMING Harry takes diving lessons at the community pool. He is trying to estimate the depth of the deepest part of the pool. Which is the most likely estimate: 3.5 centimeters, 3.5 meters, or 3.5 kilometers? Explain.</p>	<p>4. INSECTS Michaela is an entomologist, a scientist who studies insects. When she measures the length of the leg of a fly, what metric unit of measure does she most likely use?</p>
<p>5. SCHOOL Roshawn rides his bike $2\frac{1}{2}$ miles to and from school. What type of measurement would he use if he were to convert the distance to metric units? Explain.</p>	<p>6. BRIDGES Paula noticed an error in the following statement, “The Golden Gate Bridge in San Francisco, California, is the second longest suspension bridge in North America spanning 1,260 kilometers.” What is the error Paula found? Explain.</p>

12-4**Practice: Word Problems*****Mass and Capacity in the Metric System***

<p>1. ANTS Earl has an ant farm. What metric unit of mass would Earl use to measure one of his ants?</p>	<p>2. MEDICINE Garry is taking a tablespoonful of cough syrup for his cold. What is the metric unit of measure most likely used for his recommended dosage? Estimate the amount.</p>
<p>3. WEIGHTLIFTING Amy does three sets of squats with 85 pounds at the gym. What metric unit of measure would Amy use to measure the weight she lifts?</p>	<p>4. FISHING Which is the most likely unit of measure Jacob finds on his fishing weights: milligram, gram, or kilogram?</p>
<p>5. DOGS What metric unit of mass would Toni most likely use to measure the mass of her dog?</p>	<p>6. AQUARIUMS Sage is making a fish tank out of an old 5-gallon glass water bottle. What unit of metric measure should she use to decide how much water the bottle will hold? Estimate the amount.</p>
<p>7. PETS Carla's dog eats 321 grams of beef chow and 410 grams of chicken chow each day. Meda's dog eats 1 kilogram of mixed chow each day. Whose dog eats more chow each day? Explain your reasoning.</p>	<p>8. SHOPPING Liquid detergent comes in 1.62-liter bottles and 1,500-milliliter bottles. Which bottle contains more detergent? Explain your reasoning.</p>

12-5**Practice: Word Problems*****Changing Metric Units***

<p>1. MEDICINE Stephanos got a travel pack of 4 aspirin, each 500 milligrams. How many total grams are in the pack?</p>	<p>2. SNAILS While doing a report on snails, Kay learned that the average snail moves about 0.013 meter per second. How many centimeters per second does a snail move?</p>
<p>3. SPORTS The Wildcats' water cooler holds 15.3 liters of sports drink. How many milliliters is that?</p>	<p>4. BAKING A box of specialty baking flour holds 1.8 kilograms. How many angel food cakes can be made with a recipe that calls for 100 grams of flour?</p>
<p>5. WRESTLING As a Sumo wrestler, Ishi must weigh a minimum of 70 kilograms. How many grams is that?</p>	<p>6. SOCCER Joey walks 4.2 kilometers to soccer practice. How many meters does he walk?</p>
<p>7. MILK Each week Mrs. Lopez has six 946-milliliter bottles of milk delivered to her home. How many liters is each bottle?</p>	<p>8. EARTH Beth's class is studying earthquakes. They learned that the Pacific plate, a huge section of the Earth's crust, moves 45 millimeters per year. How many centimeters per year is that?</p>

12-6**Practice: Word Problems*****Measures of Time***

<p>1. BUS RIDES Cheryl rides the city bus to and from ballet practice. Her ride to the dance studio takes 48 minutes. Her ride home takes 1 hour 7 minutes. What is the total time Cheryl rides the bus?</p>	<p>2. ECLIPSES Heather has seen two solar eclipses; one on June 21, 2001, which took 4 min 57 s and the other on August 11, 1999, which took 2 min 23 s. How much longer did the Sun take to complete the eclipse in 2001?</p>
<p>3. TRAVEL The Rosenberg family is taking a road trip. First they will drive 9 hours 53 minutes to camp in the Red Rock Canyons. Then they will drive 8 hours 21 minutes to ski near Salt Lake City. What will be their total driving time?</p>	<p>4. RUNNING The Boston Marathon course record holder in the Women's Open is Margaret Okayo. She ran the course in 2 hours, 20 minutes, and 43 seconds. Jean Driscoll is the record holder in the Women's Wheelchair division with a time of 1 hour 34 minutes 22 seconds. How much longer did it take Okayo to finish the course?</p>
<p>5. BEACH Toni left at 6:45 A.M. to go surfing. She got home 7 hours and 26 minutes later. What time did she get home?</p>	<p>6. HOMEWORK James started doing his homework at 10:35 A.M. and stopped at 1:17 P.M. What was the total time he spent on homework?</p>
<p>7. TRAVEL Kevin is flying from San Francisco, California, to Hartford, Connecticut, with a layover in New York. His flight from California to New York will take 5 hours and 22 minutes. His flight from New York to Connecticut will take 53 minutes. What is his total flying time?</p>	<p>8. PAINTING Geri worked on her painting this morning from 10:15 A.M. to 12:32 P.M., then again in the afternoon from 4:45 P.M. to 6:30 P.M. How much time did she spend total working on her painting?</p>

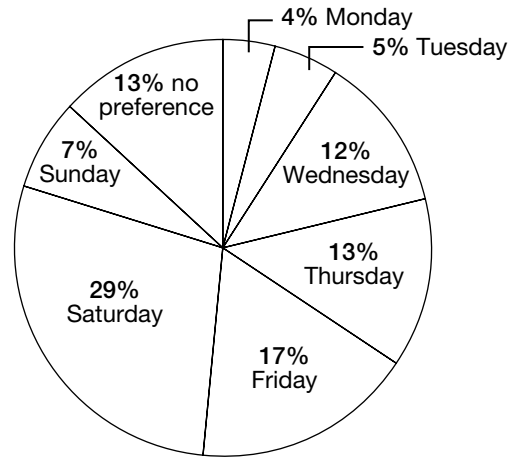
13-1


Practice: Word Problems

Angles

SHOPPING For Exercises 1–3, use the circle graph that shows preferred shopping days of United States shoppers.

Preferred Shopping Days for United States Shoppers



<p>1. Find the approximate measure of each angle formed by the sections of the circle graph.</p>	<p>2. Find the sum of the measures of the angles of the circle graph.</p>
<p>3. If the shoppers with no preference could be persuaded to shop on Wednesdays, what would be the new angle measure of the Wednesday section of the graph?</p>	<p>4. CARPENTRY Jorge is building a standard bookshelf. For the books to sit squarely on the shelves, will he be using obtuse, right, or acute angles when placing the shelves in the bookcase?</p>
<p>5. TILING Fatima is tiling her bathroom floor. She cut a square tile along one of the diagonals. What is the angle measure created by the diagonal and a side of the tile?</p>	<p>6. PIZZA Cody has half a pizza to share with two of his friends. What angle measure should Cody use to cut half of the pizza into three equal pieces?</p> 

13-2**Practice: Word Problems*****Using Angle Measures***

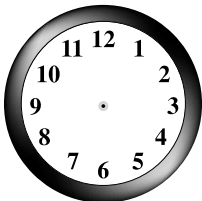
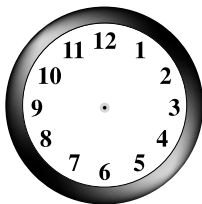
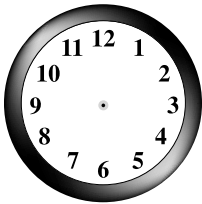
1. TIME Marissa started working on her homework at noon. Since then the minute hand has moved 180° . What time is it now?

2. BICYCLING Scott went for a bike ride. After heading east for a while he turned left 57° . Draw an angle showing Scott's route.

3. PIZZA Rene cut a pizza into eight equal slices. Draw a picture showing how Rene cut the pizza. What is the angle measure of each slice?

4. PIZZA Refer to Exercise 3. What would the angle measure be of three pieces side by side? Draw the angle.

5. CLOCKS Give examples of times when the hour hand and minute hand make a 30° angle, a 60° angle, and a 150° angle. Draw three clocks showing these times.



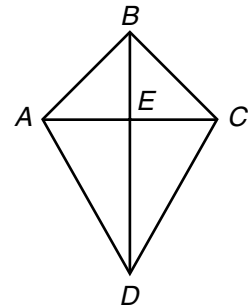
6. TILING Stasia has 4 pieces of tile. One angle on each piece measures 38° , 22° , 68° , and 51° . Which two pieces should she use side by side to make a right angle?

13-3

Practice: Word Problems

Bisectors

KITES For Exercises 1–6, use the design shown. It shows the kite design Steve is using to build a kite.



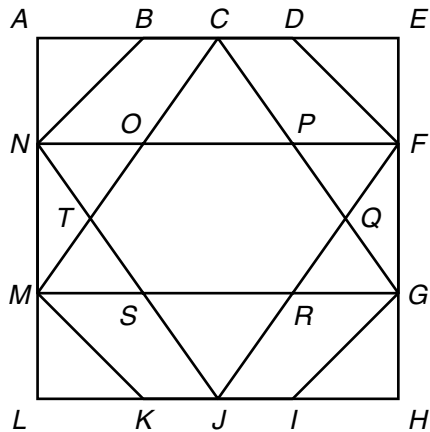
<p>1. For which line segment should Steve use \overline{BD} as a perpendicular bisector when making his kite?</p>	<p>2. Should Steve use \overline{CA} as a perpendicular bisector for \overline{DB}? Why or why not?</p>
<p>3. Which angles, if any, does \overline{BD} bisect?</p>	<p>4. Should Steve use \overline{AE} as a bisector for $\angle BAD$? Why or why not?</p>
<p>5. Use a compass and a straightedge to show where the perpendicular bisector for \overline{BD} would be. Use a dashed line and label it \overline{XY}.</p>	<p>6. Use a compass and a straightedge to bisect $\angle BAD$. Use a dashed line and label the bisector \overline{AZ}.</p>

13-4

Practice: Word Problems

Two-Dimensional Figures

STAINED GLASS For Exercises 1–6, use the design for a stained glass window shown.



<p>1. Find and name two triangles in the design.</p>	<p>2. Is there a regular quadrilateral in the design? If so, where is it?</p>
<p>3. Find and name an octagon in the design.</p>	<p>4. Can you find a parallelogram in the design? Identify it.</p>
<p>5. Is the pentagon $CQRST$ a regular pentagon? Explain.</p>	<p>6. If the perimeter of the window is 8 feet, what is the length of each side? How do you know?</p>

COMMON OBJECTS For Exercises 7 and 8, use the list of polygons you see on a regular basis.

door

textbook cover

computer screen

stop sign

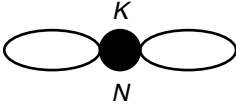
vinyl album cover

CD case

<p>7. Which object on the list is <i>not</i> a quadrilateral? What type of polygon is it?</p>	<p>8. Are there any objects on the list that are regular? If so, what are they? Explain.</p>
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13-5**Practice: Word Problems*****Lines of Symmetry***

GAMES For Exercises 1–4, use the following information. Katie and Natalie designed a symmetry game for a math assignment. The strategy of the game is for Katie and Natalie to sit on opposite sides of the board and see the exact same thing on the board.

<p>1. The board they designed is shown below. If Katie and Natalie sit where the K and N are placed, will they see the same thing? In other words, does the board have rotational symmetry?</p> 	<p>2. The number 1991 is written in each oval of the board. Do Katie and Natalie see the same thing? Explain.</p>
<p>3. Suppose the number 1961 is written instead. Do Katie and Natalie see the same thing? Explain.</p>	<p>4. What are three more numbers that can be used in this game?</p>
<p>5. NUMBERS Frank and Cassandra drew lines of symmetry for the numbers 1 through 6. Frank says that five numbers do not have any lines of symmetry. Cassandra says that only four do not have any lines of symmetry. Who is correct? Explain.</p>	<p>6. NUMBERS Refer to Exercise 5. Are there any numbers with more than 1 line of symmetry? If so, which one(s)? Explain.</p>

14-1

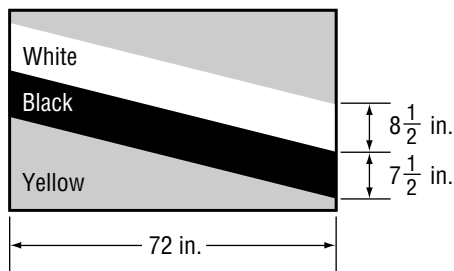
Practice: Word Problems

Area of Parallelograms

1. SUNFLOWERS Norman is a sunflower farmer. His farm is in the shape of a parallelogram with a height measuring 3 kilometers and a base measuring 4.2 kilometers. To the nearest tenth of an acre, what is the total land area Norman uses?

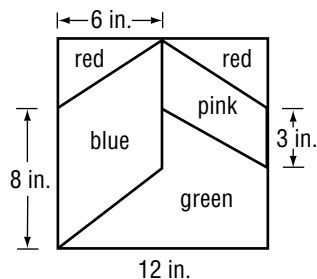
2. VOLLEYBALL Ella and Veronica are in charge of making a banner for the volleyball game this Saturday. How much poster paper will they need for a parallelogram-shaped banner with height $3\frac{1}{2}$ feet and base 6 feet? Explain how you found your answer.

3. FLAGS Joseph is painting the flag of Brunei (a country in Southeast Asia) for a geography project at school. How many square inches will he cover with white paint?



4. FLAGS Use the flag from Exercise 3. How many square inches will Joseph cover with black paint?

5. QUILTING The pattern shows the dimensions of a quilting square that Sydney will use to make a quilt. How much blue fabric will she need? Explain how you found your answer.



6. QUILTING Use the quilting pattern from Exercise 5. How much pink fabric will Sydney need?

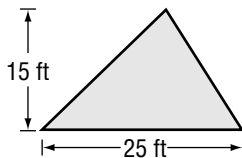
14-2**Practice: Word Problems****Area of Triangles**

For Exercises 1–6, round to the nearest tenth if necessary.

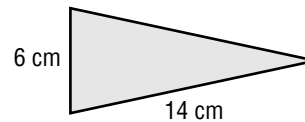
- 1. CARPETING** Courtney wants to carpet part of her bedroom that is shaped like a right triangle with base 4 meters and height 5.2 meters. How much carpet will she need?

- 2. LAWN** Mrs. Giuntini's lawn is triangle-shaped with a base of 25 feet and a height of 10 feet. What is the area of Mrs. Giuntini's lawn? Explain how you found your answer.

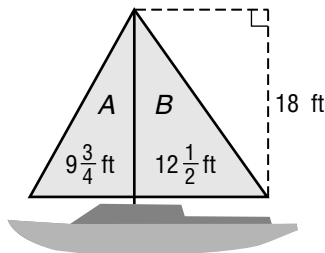
- 3. BUILDING** Norma has an A-frame cabin. The back is shown below. How many square feet of paint will she need to cover the back of the cabin?



- 4. SNACKS** The dough that will be used to make a pig in a blanket is shown below. Before it is rolled around a sausage, it is brushed with vegetable oil. What is the area that needs to be covered with oil? Explain how you found your answer.



- 5. SAILING** Daniel just bought a used sailboat with two sails that need replacing. How much sail fabric will Daniel need if he replaces sail A?



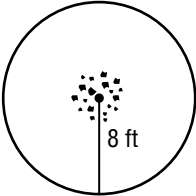
- 6. SAILING** Use the picture from Exercise 5. How much sail fabric will Daniel need if he replaces sail B?

14-3

Practice: Word Problems

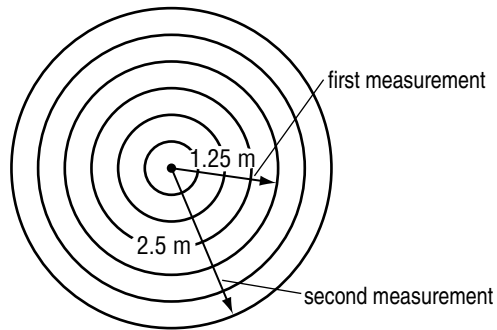
Area of Circles

For Exercises 1–4, find each area to the nearest tenth. Use 3.14 for π .

<p>1. SWIMMING POOLS Jensen’s parents put him in charge of ordering a cover for their new swimming pool. The pool is in the shape of a circle and has a radius of 14 feet. What will the area of the cover need to be?</p>	<p>2. BASKETBALL Thompson School will paint the center circle of the basketball court with yellow paint, one of the school colors. The circle has a radius of 2 feet. What is the area that will be painted yellow?</p>
<p>3. BASEBALL The pitcher’s mound on a regulation baseball field has a diameter of 18 feet. What is the area of a pitcher’s mound?</p>	<p>4. CAMPING A group of campers needs to clear away twigs and bark on the ground to make a fire circle for people to safely sit around the campfire. What is the area that they need to clear?</p> 

For Exercises 5 and 6, find each area to the nearest tenth. Use 3.14 for π . Use the following information.

SCIENCE Hal and Frank are conducting a science experiment. They drop a pebble into a pond and measure the radius of the circles of waves.

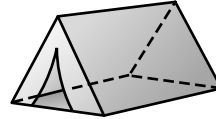


<p>5. What was the area covered by waves the first time it was measured?</p>	<p>6. What was the area covered by waves the second time it was measured? Explain how you found your answer.</p>
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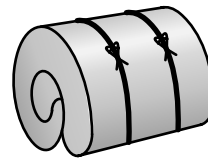
14-4**Practice: Word Problems****Three-Dimensional Figures**

1. TENNIS As professional tennis players, Venus and Serena Williams strike tennis balls with rackets. Draw the figure that represents a tennis ball. What type of figure is this?

2. BACKPACKING Below are pictures of some of the objects Kelly takes with her for backpacking trips. Identify the figure each picture represents.



Tent

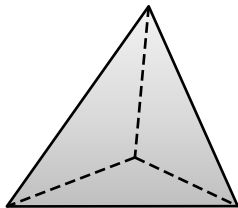


Sleeping Bag

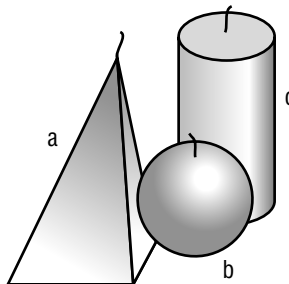
3. MECHANICS A mechanic uses a funnel when he or she puts fluids into cars. What type of figure does a funnel represent? Draw the figure.

4. DESIGN Rachael Johnson is a toy designer. She uses square blocks of wood to make alphabet blocks. Draw and name the figure that an alphabet block represents.

5. FIGURES Alice and Julie were arguing over the name of this figure. What is the name of the figure? How do you know?



6. CANDLES Kevin arranged several scented candles on his kitchen table before his birthday party started. Use the picture of Kevin's arrangement to name the type of figure each candle represents.



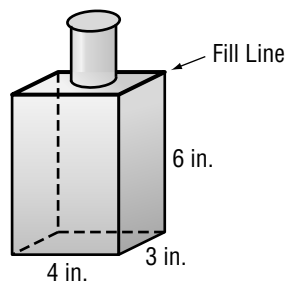
14-5**Practice: Word Problems*****Volume of Rectangular Prisms***

Find the volume to the nearest tenth if necessary.

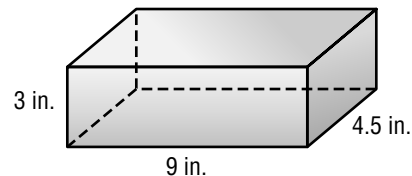
- 1. OLYMPICS** Olympic gold medal winner Ian Thorp competes in a pool with required dimensions 25 meters by 50 meters by 2 meters. What is the volume of the Olympic-sized pool? Explain how you found your answer.

- 2. DUMP TRUCKS** Raphael drives a standard-sized dump truck. The dimensions of the bed of the truck are length 15 feet, width 8 feet, and height 6 feet. What is the volume of the bed of the dump truck?

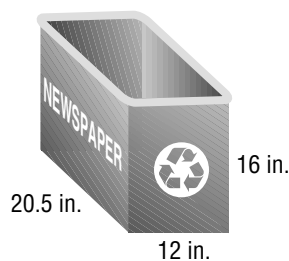
- 3. GIFTS** William has some antique bottles. He is going to fill the bottles with bath soap and give them away as gifts. Use the figure to find the volume up to the fill line of a bottle.



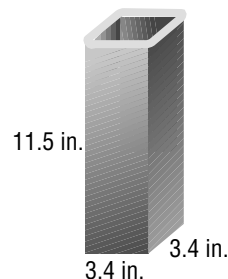
- 4. JEWELRY** Janine keeps her jewelry in a jewelry box like the figure below. Find the volume of Janine's jewelry box.



- 5. RECYCLING** The town of Riverview provides a rectangular recycling bin for newspapers to each household. What is the greatest volume of newspapers the recycling bin can hold?



- 6. CANDLE MAKING** Kyle will fill the candle mold with liquid candle wax. Find the amount of liquid wax that will be contained in the mold. Explain how you found your answer.



14-6**Practice: Word Problems****Surface Area of Rectangular Prisms**

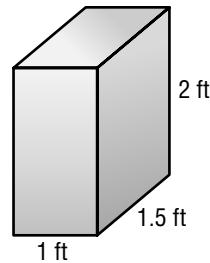
For Exercises 1–6, round each surface area to the nearest tenth if necessary.

1. GIFTS Fatima is wrapping a gift box for her nephew's birthday. The box's dimensions are 16 inches long by 10 inches wide by 5 inches high. What is the surface area of the box?

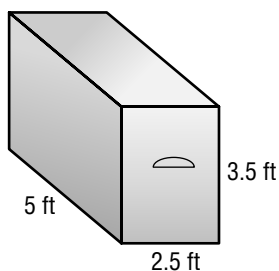
2. FOOD Antoine is wrapping a block of cheese that is 22 centimeters long by 6.5 centimeters high by 10 centimeters wide with plastic wrap. What is the surface area of the cheese block?

3. PAINTING Kyle is painting the front door of his house. The dimensions of the door are 80 inches by 30 inches by 2 inches. If he paints all of the surfaces, how much area will he paint? Explain.

4. CARPENTRY Bryan is sanding a set of speaker boxes that he built for his room. What is the surface area of each box?



5. CARPENTRY Cindy is putting oak veneer (thin wood covering) on the entire surface of her hope chest. How much veneer will she need?



6. TOY MAKING Trey is covering blocks of wood with wallpaper to make building blocks for his baby sister. If he covers all the surfaces, how much wallpaper will he need? Think of a short way to solve this problem and explain.

