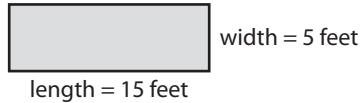**Lesson 1-1**

Practice: Problem Solving

Solve.

1   GARDENING   The dimensions of a flower garden are 15 feet long by 5 feet wide. In simplest form, what is the ratio of the garden's width to its length?

width = 5 feet

length = 15 feet

_____

2   HOBBIES   A jewelry-making kit contains 15 blue beads, 25 red beads, 10 yellow beads, and 30 black beads. In simplest form, what is the ratio of red beads to black beads?

_____

3   ELECTIONS   Carlos, Leona, and Kim ran for class president. The table below shows the number of votes each student received. In simplest form, what is the ratio of votes Carlos received to the total number of votes?

_____

Votes Counted for Class President	
Carlos	⅂⅂⅂⅂⅂⅂⅂⅂⅂⅂ II
Leona	⅂⅂⅂⅂⅂⅂⅂⅂⅂⅂ I
Kim	⅂⅂⅂⅂⅂⅂ III

4   WEATHER   During the first 28 days of April, it rained on 8 days. If it rains the last two days of April, what will be the ratio of the number of rainy days in the month to the total number of days in the month? Write your answer in simplest form.

_____

5   BASEBALL   A baseball team played 120 games during a season. The ratio of the number of games won to the total number of games played is $\frac{2}{3}$. How many games did the team lose during the season?

_____

Lesson 1-2

Practice: Problem Solving

Solve.

1 **TECHNOLOGY** A laser printer can print 150 pages in 5 minutes. How many pages can the printer print in 22 minutes? _____

2 **FITNESS** The table below shows the time and distance walked for two different walkers. Which walker had the faster unit rate? Show your work.

Jenna		Theo	
Time	Distance	Time	Distance
120 minutes	8 miles	90 minutes	6.5 miles

_____

3 **FOOD** The diagrams below show the prices of large pizzas at two local restaurants. Which restaurant has the lower unit cost per pizza?

Pizza Shack Specials

Buy 2 large pizzas for $12.99 and get 1 large pizza

Leo's Pizza Parlor

Large Pizzas – $5.50 each

_____

4 **AMUSEMENT PARKS** A Ferris wheel makes $7\frac{1}{2}$ revolutions in 3 minutes. How many revolutions does it make in 5 minutes? _____

5 **PLANTS** A plant grows 4.5 inches in 3 months. At the same rate, how many inches will the plant grow in 8 months? _____

6 **TRAVEL** A jet aircraft traveled 2,750 miles in 5 hours. Find a unit rate to describe its average speed. _____

7 **POPULATION** Which state in the table below has the greatest population per square mile?

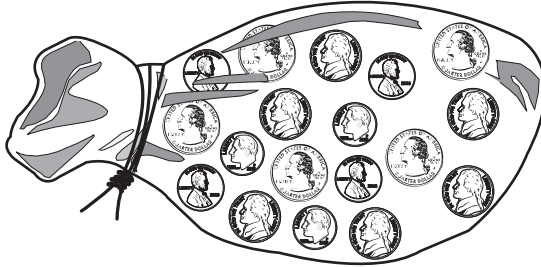| State	2002 Estimated Population	Approximate Land Area in sq miles
Maryland	5,500,000	9,800
New York	19,200,000	47,000
Connecticut	3,500,000	5,000

_____

Math Triumphs

Lesson 1-3

Practice: Problem Solving

Solve.

1. **SCHOOL** The ratio of girls to the total number of students in a class is $\frac{3}{5}$. If one student is chosen without looking, what is the probability that the student is *not* a girl? _____

2. **COINS** The bag below contains some pennies, nickels, dimes, and quarters. One coin is drawn from the bag without looking. What is the probability that the coin is a penny or a quarter?

_____

3. **FRUIT** A bag contains 3 oranges, 4 tangerines, 2 pears, and 2 apples. A piece of fruit is chosen without looking. What is the probability that the fruit is not an orange color? _____

4. **TICKETS** A group of 15 people are attending a baseball game, but they were not able to get seats together. The table below shows the location and number of seats in each row. The tickets are placed in a bag and each person picks one ticket without looking.

Tickets Available	
Row Number	Number of Tickets
1	3
5	1
12	2
16	5
27	4

a) What is the probability the first person who picks a ticket gets a seat in row 1? _____

b) What is the probability the first person who picks a ticket gets a seat in an even numbered row? _____

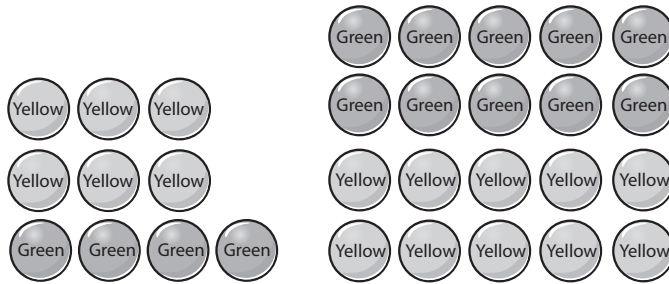c) What is the probability the first person who picks a ticket gets a seat in row 12 or greater? _____
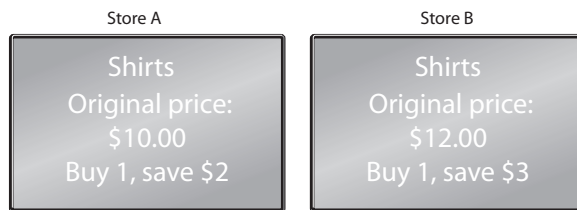
Lesson 2-1

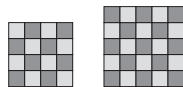# Practice: Problem Solving

Solve.

1. **BASKETBALL**   At practice, Ben made 22 out of 25 free throws. Kirk made 18 out of 20 free throws. Who made the greater percentage of free throws? _____

2. **SAVINGS**   Jodi saves $10 of every $50 she earns. Serena saves $6 of every $30 she earns. Who saves the greater percentage of their earnings? _____

3. **JUGGLING**   A juggler has two sets of juggling balls. The number of yellow balls and green balls in each set is shown. In which set is the greater percentage of yellow balls? _____

4. **SPORTS**   The team has won 52 out of 80 games so far this season. Earlier in the season, they had won 42 out of 60 games. Has the team been doing better or worse? Explain. _____

5. **SHOPPING**   Which store is offering the greater percentage discount on their shirts? _____

Store A
Shirts
Original price:
$10.00
Buy 1, save $2

Store B
Shirts
Original price:
$12.00
Buy 1, save $3

6. **PATTERNS**   Which pattern has the greater percentage of dark squares? _____

7. **BOOKS**   A school librarian asked all 300 students to name their favorite type of book. The responses are shown in the table. Write each percent as a decimal and a fraction in simplest form.

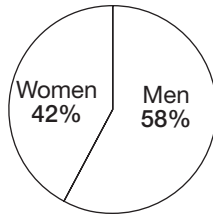| Type of book	Mystery	Fiction	Biography	Nonfiction
Percent of students	15%	44%	7%	34%

_____

Lesson 2-2

Practice: Problem Solving

Estimate the answer. Then calculate the exact answer.

1 **SHOPPING** A store is having a sale as shown on the sign. Write the percent as a fraction in simplest form and a decimal. _____

Original price:
$42.00
35% off

2 **FAVORITES** A school survey showed that $\frac{4}{25}$ of the students said that their favorite color was blue. Write the fraction as a percent. _____

3 **DOGS** 78% of the dogs at the park were black. Write the percent as a fraction in simplest form. _____

4 Write the percent as a decimal. _____

5 **POPULATION** The town gender population is shown in the circle graph. Write each percent as a decimal. _____

Women
42%

Men
58%

6 **MUSIC** The table shows student responses to a survey about the students' favorite types of music.

Type of Music	% of Students
Country	12%
Rap	18%
Classical	25%
Rock	45%

a. How many chose rock? Write the percent as a fraction. _____

b. How many chose classical? Write the percent as a fraction. _____

Lesson 2-3

Practice: Problem Solving

Solve.

1 **SNACKS** Maxine has a bag filled with 4 oatmeal cookies, 8 chocolate cookies, and 3 sugar cookies. If she picks out 1 cookie without looking, which kind is she most likely to pick? Write as a ratio in simplist form the number of each kind of cookie to the total number of cookies. _____

2 **BASKETBALL** The table below shows the number of shots each player took and how many shots were made. Who made a greater fraction of their shots? _____

Player	Number of Shots Made	Number of Shots Taken
Player 1	7	8
Player 2	8	10

3 **FAVORITES** A class survey showed that 16% of the students chose soccer as their favorite sport, $\frac{7}{25}$ of the students chose baseball, and 0.56 of the students chose basketball. Which sport was the most popular? _____

4 **BAKING** Javier needs $3\frac{2}{5}$ cups of flour for a recipe. If his measuring cup only shows decimal increments, how much flour will he need to measure? _____
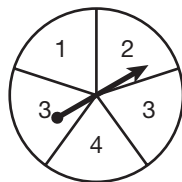
5 **TIPS** Aurelia wants to give a 17 percent tip on a bill of $35.80. Ivan wants to leave 0.2 of the total. Who wants to leave more money for the tip? _____

6 **PROBABILITY** You are spinning the spinner below. What is the probability of landing on 3? Write your answer as a fraction in simplest form, a decimal, and a percentage. _____
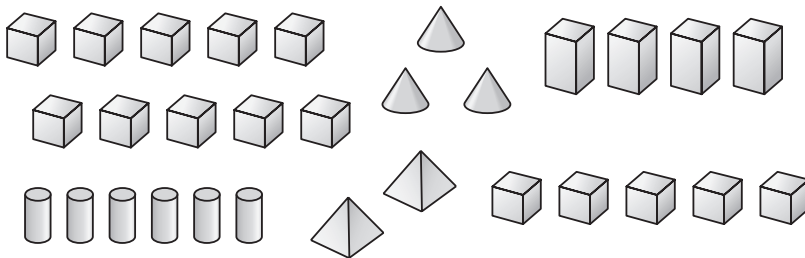

7 **BASKETBALL** Steve made 18 out of 20 free throws. Amare missed 3 out of 25 free throws. Who made the greater fraction of their free throws? _____

Lesson 3-1

Practice: Problem Solving

Solve.

1. **SCHOOL** At a local high school, 540 of the 1,500 students were on the honor roll. What percent of the students were on the honor roll?

   _____

2. **TESTING** A test is comprised of 60 questions, of which 70% are multiple choice. How many questions are multiple choice?

   _____

3. **CHEMISTRY** A solution contains 12% acid. If this amounts to 1.5 ounces, how much liquid is in the solution?

   _____

4. **BOOKS** In Ernesto's collection, 40% of his books, or 24 books, are science fiction. How many books does Ernesto have in his collection?

   _____

5. **PHARMACY** A pharmacist must prepare a 25% alcohol solution. The total amount of the solution must be 2 ounces. How much of the solution is alcohol?

   _____

6. **BLOCKS** Angel has a set of 30 building blocks. What percent of Angel's building blocks are cylinders?

   _____

7. **CARS** A car dealership sells both new and pre-owned cars. There are 240 pre-owned cars on the dealership lot. If 32% of the cars on the lot are pre-owned, what is the total number of cars at this dealership?

   _____

8. **SURVEY** Misu did a survey in his class. He asked each student what sport he or she liked to play the most. The results are displayed in the table. Complete the table, finding the percent of students who chose each sport.

Sport	Number of Students	Percent of Students
Football	3	
Baseball/Softball	8	
Soccer	5	
Basketball	9	

Chapter 3

Lesson 3-2 Practice: Problem Solving

Solve.

1 **HORSES**   A rancher has a total of 50 horses. Of the horses, 78% of them are Palomino horses. How many Palomino horses does the rancher have?

_____

2 **GRADES**   To earn a grade of B, you have to earn 80% to 89.9% of the total points for the term. If there were 1,500 points available during the term, between what numbers of points do you have to earn to get a B? Round to the nearest point.

_____

3 **TESTING**   In one section of a test, 4% of the items were essay questions. If there were three essay questions, how many items were in that section of the test?

_____

4 **BASEBALL**   Allie bought a baseball for $6.95. The sales tax rate was 7%. How much did she pay for the baseball?

_____

5 **SALES TAX**   Pastora purchased a pair of tennis shoes priced at $38.00 from a local department store. The receipt showed that sales tax on the item was $3.61. What is the sales tax rate?

_____

6 **DISCOUNTS**   A toy store is having a going out of business sale. Fernando purchased 3 items that were each priced $24.95. What was the sale price of each item?

_____

> **Going out of Business Sale**
> • Buy 1 item & get 50% off
> • Buy 2 items & get 55% off
> • Buy 3 items & get 60% off
> • Buy 4 or more items & get 65% off

7 **STUDENTS**   In Jada's class, she has observed that there are fewer girls than boys. Of the students in her class, about 39% are girls. If there are 23 students in her class, how many are girls?

_____

8 **CARS**   Lamont was waiting for a bus and decided to pass the time by counting the number of cars that passed by. Lamont counted a total of 136 cars and he noticed that 13 of those cars were red. What percent of the cars that passed by were red? Round to the nearest tenth of a percent.

_____

Lesson 3-3

Practice: Problem Solving

Solve.

1 **BUSINESS** Amber took out a small business loan to start a catering service. She borrowed $750,000 for 5 years at a simple interest rate of $8\frac{1}{2}$%. At the end of 5 years, how much will she have repaid?

_____

2 **INVESTMENT** Clara invested $2,500 in a certificate of deposit (CD). The CD compounds annually, earning a rate of 3.75% each year. Complete the table, finding the value of the CD at various times.

	5 years	10 years	15 years	20 years
Amount	$3,005.25			

3 **SAVINGS** Aisha invested $200 at 4% simple interest. Shiv invested $225 at 3.5% simple interest. After 10 years, who's interest was greater and by how much?

_____

4 **PLANNING** Barbara wants to save $50,000 for her newborn son's college education. How much should she invest at $6\frac{3}{4}$% simple interest in order to have $50,000 in 18 years?

_____

5 **PLANNING** Adelina wants to save $50,000 for her newborn son's college education. How much should she invest at $5\frac{1}{2}$% compounded quarterly in order to have $50,000 in 18 years?

_____

6 **LOANS** Jeremiah got a loan from his father to enclose his garage and turn it into a game room. The loan was for $6,000 and they agreed that Jeremiah would repay the loan in 2 years with 2% simple interest. At the end of 2 years, how much interest did Jeremiah pay his dad for borrowing the money?
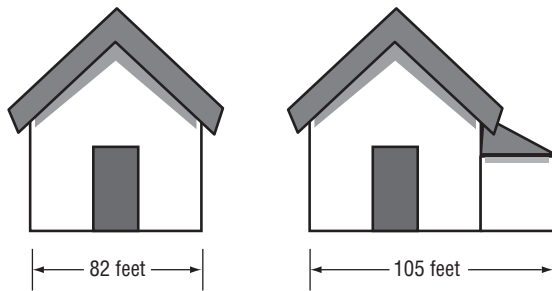
_____

7 **BANKING** Sophie wanted to put money into an interest-bearing account at her bank. She invested $500 for 8 years. How much interest did she earn at the end of 8 years?

_____

Simple Interest Loans
0–5 yrs at 2%,
6–10 years at 3%,
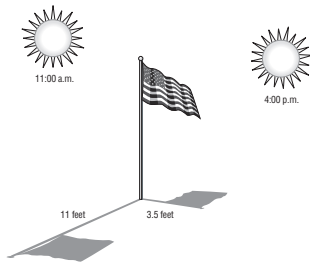11–15 years at 4%
16–20 years at 5%

Chapter 3

Lesson 3-4 Practice: Problem Solving

Solve.

1. **WATER**   The weight of a sponge increases 225% after soaking up water. If the sponge weighs 1.5 ounces when dry, what is its weight when wet? Round to the nearest tenth of an ounce.

   _____

2. **RETAIL**   A store buys a pair of pants for $6.50. What is the selling price of the pants if the store has a markup of 150%?

   _____

3. **BLUEPRINT**   Nathan is adding an extra room onto his house. By what percent did the length of the house change? Round to the nearest whole percent.

   _____

   ⟵ 82 feet ⟶   ⟵ 105 feet ⟶

4. **DIET**   Delmar weighs 172 pounds. By changing his diet, his weight decreased by 12%. What is his reduced weight? Round to the nearest whole pound.

   _____

5. **SHADOWS**   Wesley observed that, before lunch time, the flagpole's shadow was short and after school the flagpole's shadow was long. What is the percent change in the length of the flagpole's shadow? Round to the nearest tenth of a percent.

   _____

   11:00 a.m.   4:00 p.m.

   11 feet   3.5 feet

6. **SHOPPING**   Carmen went shopping for a new dress. She found a dress marked $85.95. The dress was on sale at a discount of 40%. What price did Carmen pay for the new dress she bought?

   _____

7. **RACING**   At the beginning of her training, it took Jamila 45 minutes to run a distance of 5 miles. With practice she can now run the distance in 20% less time. How long does it take Jamila to run a distance of 5 miles now?

   _____

Math Triumphs
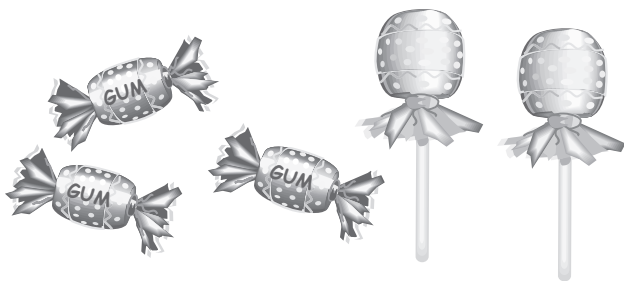
Chapter 3

Lesson 4-1

Practice: Problem Solving

Solve.

1 PACKAGING The Bracket Company sends out 6 screws with each order of 2 brackets. How many screws do they need to send out with an order for 500 brackets?

_____

2 HALLOWEEN Mr. Goetz hands out the same combination of treats to each person on Halloween. He handed out 66 pieces of gum. How many lollipops did Mr. Goetz hand out?

_____

3 FITNESS Awan's exercise routine includes repetitions of 20 push-ups and 30 sit-ups. On Tuesday, he did 100 push-ups. How many sit-ups did Awan do on Tuesday?

_____

4 BIOLOGY Una is making media to culture cells. She uses 3 units of antibiotic for every 250 milliliters of media. She needs 1,000 **milliliters** of media. How many units of antibiotic does Una need to add?

_____

5 MAPS Tulaya made a treasure map for her little brother. She says to take 6 steps for every 2 dashes on the map. If there are 5 dashes on the map, how many steps will her brother need to take?

_____

6 ENGINEERING Ellis is designing heat ducts for a new building. The specifications for the system require ducts with 6 inches in diameter for every 10 cubic feet of air flow. One of the sections of the system has 40 cubic feet of air flow. What should the diameter of the duct be for this section?
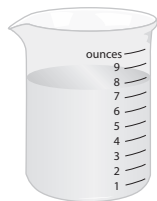
_____

7 ADVERTISING A beauty magazine needs to fill 6 pages with ads for every 9 pages of articles to meet their budget. This month's issue is projected to have 117 pages filled with articles. How many ad pages will the magazine have?

_____

Lesson 4-2

Practice: Problem Solving

Solve. Round to the nearest tenth.

1 **CHEMISTRY** Karina is making a solution of citric acid. She needs 200 grams of citric acid powder to make the solution. Does Karina have enough? Explain. One ounce equals about 28.35 grams.

Citric Acid 8 ounces

_____

2 **RUNNING** Owen ran in a marathon last weekend. He determined that he ran the marathon at an average speed of 1.5 meters per second. What was his speed in miles per hour? One meter per second equals about 2.237 miles per hour.

_____

3 **ART** Jessica is going to make a sculpture using metal. First she wants to make a sketch of her design. She needs to know the thickness of the metal in millimeters. How many millimeters thick is Jessica's metal? One inch equals about 25.44 millimeters.

_____

0.1 in.

4 **BAKING** Alan is using a cookie recipe that requires $2\frac{1}{4}$ cups of butter. If each stick equals $\frac{1}{2}$ cup, how many sticks of butter does Alan need for his recipe?

_____

5 **HORTICULTURE** Taci is growing a tomato plant that is currently 35.62 mm tall. How many centimeters tall is Taci's tomato plant?

_____

6 **EMPLOYMENT** Nalin worked for 360 minutes yesterday. He needs to give his boss his time sheet in hours since he is paid by the hour. How many hours did Nalin work yesterday?

_____

7 **CONSTRUCTION** Javon has plans to build a dog house. The plans recommend using 2-by-4 pieces of wood that are 2.65 meters long. The home improvement store needs the measurement in feet. What is the length of the 2-by-4 pieces of wood that Javon needs in feet? One meter is equal to approximately 3.281 feet.

_____

Lesson 4-3

Practice: Problem Solving

Solve.

1   EMPLOYMENT   Oscar made $375.00 working 15 hours at his
summer job last week. Oscar worked 28 hours this week. How
much will Oscar make this week?   _____

2   TECHNOLOGY   Ebony is downloading a file at a rate of 96 kilobytes
per second. How large is Ebony's file?   _____

3   TRAVEL   Roman is driving 250 miles to Colorado. His car gets
20 miles per gallon. How many gallons of gasoline will Roman use?   _____

4   CHEMISTRY   Ying placed several tubes in a centrifuge. The
centrifuge made 1,500 revolutions in 3 minutes. How many
revolutions would it make in 7 minutes?   _____

5   BOATING   Jin is tracking the position of his boat on a chart. He
traveled 18 nautical miles per hour for 3 hours. How many
nautical miles did Jin travel in 8 hours?   _____

6   BIKING   Aponi is training for a bike race. During her training on
Friday, she biked for $4\frac{1}{2}$ hours. Her average speed was 18 miles
per hour. How far did she bike on Friday?   _____

7   EATING   Vincent won first place in a hot dog eating contest last
month. He ate 22.5 hotdogs in 6 minutes. Next month, he will
have only 5 minutes to eat hotdogs. How many hot dogs would
you expect Vincent to eat in that time?   _____

8   MANUFACTURING   Abey is the manager of an assembly line that
produces bicycle pedals. She wants to know how many pedals
they will be able to produce by the end of the shift. The line
produces 120 pedals in 4 minutes. There are $1\frac{1}{2}$ hours left in the
shift. How many more pedals will the assembly line make?   _____

Math Triumphs

Practice: Problem Solving

Solve.

1 **SPA** Casey is filling her hot tub. The water is coming out at a rate of 3 gallons per minute. Her hot tub has a capacity of 100 gallons. How long will it take for Casey to fill her hot tub? _____

2 **TECHNOLOGY** Ernesto downloaded a picture from his friend. The picture downloaded at a rate of 90 kilobytes per second. What was the size of the picture? _____

3 **TYPING** Marvin can type 52 words per minute. His boss gave him a report to type this morning. Marvin assumes that there are 250 words on each page. How long will it take Marvin to type the report? _____

4 **UTILITIES** The Rollins family consists of 8 people. Mr. Rollins never has enough hot water for his shower. Their house has a 20-gallon hot water heater which runs out of hot water after 4 showers. Mr. Rollins wants to buy a larger water heater. Will everyone in the Rollins family be able to get a hot shower if Mr. Rollins buys a 35-gallon water heater ? Explain. _____
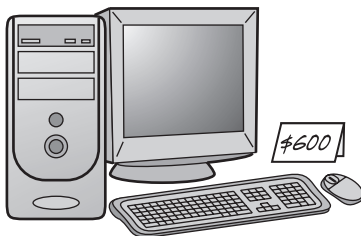
5 **HOUSEKEEPING** Felicia can clean 10 hotel rooms in 2 hours. Her boss wants to know how long it will take her to clean all 15 rooms on the 8th floor. How long will it take Felicia to clean all of the rooms? _____

6 **INCOME** Lakita is saving her money to buy a new computer. She gets paid $112.00 for 8 hours of work. How many hours will Lakita have to work to purchase a new computer? _____

7 **FISH** Areva's fish tank is gaining 7 parts per million of nitrate every 2 days. Areva was told to change the water when it reaches 28 parts per million of nitrate. How often should Areva expect to change the water? _____