PRE ALGEBRA PA CORE Course 2

STUDENT WORKBOOK

Unit 1 Ratios and Proportions

Before

After

1	**Ratios and Proportions**	PURPLE	GREEN	RED
1.1	Rates			
1.2	Complex Fractions and Unit Rates			
1.3	Convert Unit Rates			
1.4	Proportional and Nonproportional Relationships			
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STUDY ISLAND TOPICS

Unit Rates
Proportional Relationships
Percents
Ratios and Proportions

Name: _____ Period ____

Name: _____ Period _____

UNIT 1 RATES AND PROPORTIONAL RELATIONSHIPS WORKBOOK

Lesson 1.1 Skills Practice

Rates

Find each unit rate. Round to the nearest hundredth if necessary.

1. $112 in 8 hours

2. 150 miles in 6 gallons

3. 49 points in 7 games

4. 105 students in 3 classes

5. 120 problems in 5 hours

6. 3 accidents in 12 months

7. 6 eggs in 7 days

8. 8 batteries in 3 months

9. 122 patients in 4 weeks

10. 51 gallons in 14 minutes

11. $8.43 for 3 pounds

12. 357 miles in 6.3 hours

13. 25 letters in 4 days

14. $99 for 12 CDs

15. 5 breaks in 8 hours

16. 3 trips in 14 months

17. 2 pay raises in 3 years

18. 7 errors in 60 minutes

19. 15 pounds in 6 weeks

20. 8 commercials in 15 minutes

21. 8 glasses every 24 hours

22. 13 feet in 5 steps

Choose the lower unit price.

23. $4.99 for 6 cans or $7.99 for 10 cans

24. $21.50 for 4 pounds of lunch meat or $15.10 for 3 pounds of lunch meat

Lesson 1.1 Problem-Solving Practice

Rates

1. TRAVEL During Tracy's trip across the country, she traveled 2,884 miles. Her trip took 7 days. Find a unit rate to represent the average miles she traveled per day during the trip.	**2. BUDGET** Steve was offered $5,025 per year for a weekend lifeguarding job at a local pool. He wants to know how much his monthly income will be at this salary level. What is his rate of pay in dollars per month?
3. MUSIC Randall recorded 8 songs on his most recent CD. The total length of the CD is 49 minutes. Find a unit rate to represent the average length per song on the CD. Round to the nearest hundredth.	**4. CARPETING** Hana paid $1,200 for the carpet in her living room. The room has an area of 251.2 square feet. What was her unit cost of carpeting in dollars per square foot? Round to the nearest cent.
5. SHOPPING An 8-ounce can of tomatoes costs $1.14. A 12-ounce can costs $1.75. Which can of tomatoes costs the least per ounce?	**6. PETS** Last month, Hao's dog ate 40 cans of dog food in 31 days. How many cans should Hao buy to feed his dog for the next 6 days?

Lesson 1.2 Skills Practice

Complex Fractions and Unit Rates

1. $\dfrac{1}{\frac{2}{5}}$

2. $\dfrac{4}{\frac{5}{8}}$

3. $\dfrac{4}{\frac{3}{8}}$

4. $\dfrac{10}{\frac{5}{12}}$

5. $\dfrac{8}{\frac{3}{4}}$

6. $\dfrac{\frac{1}{5}}{\frac{7}{10}}$

7. $\dfrac{\frac{2}{5}}{\frac{4}{9}}$

8. $\dfrac{\frac{8}{9}}{20}$

9. $\dfrac{\frac{5}{6}}{12}$

10. $\dfrac{\frac{3}{8}}{\frac{7}{12}}$

11. $\dfrac{\frac{7}{9}}{14}$

12. $\dfrac{\frac{6}{7}}{\frac{14}{15}}$

13. $\dfrac{\frac{8}{11}}{\frac{4}{5}}$

14. $\dfrac{30}{\frac{5}{7}}$

15 . $\dfrac{\frac{6}{7}}{21}$

16. $\dfrac{15}{\frac{5}{9}}$

17. $\dfrac{\frac{1}{3}}{\frac{8}{9}}$

18. $\dfrac{\frac{2}{3}}{\frac{24}{25}}$

Lesson 1.2 Problem-Solving Practice

Complex Fractions and Unit Rates

1. TRIP Caroline drove 350 miles to her grandmother's house. The trip took her $5\frac{1}{4}$ hours. What was her average speed in miles per hour?	**2. FUEL** A small airplane used $5\frac{2}{3}$ gallons of fuel to fly a 2 hour trip. How many gallons were used each hour?
3. COOKIES Madison wants to make cookies for her little sister's birthday party. She is cutting a roll of cookie dough into pieces that are $\frac{1}{2}$ inch thick. If the roll is 13 inches long, how many cookies can she make?	**4. FABRIC** Anita is making a curtain to surround a table. She bought $3\frac{1}{4}$ yards of fabric. Her total cost was \$13. What was the cost per yard?
5. RUNNING Russell runs $\frac{9}{10}$ mile in 5 minutes. How many miles does he run in one minute?	**6. MONEY** The Franklins have a home loan with an interest rate of $4\frac{1}{4}\%$. Write the percent as a fraction in simplest form.

Lesson 1.3 Skills Practice

Convert Unit Rates

Complete. Round to the nearest tenth if necessary.

1. 660 ft/min = _____ ft/s

2. 25 mi/h ≈ _____ ft/s

3. 32 gal/min = _____ qt/h

4. 425 ft/h = _____ in./min

5. 0.5 L/s = _____ mL/h

6. 60 ft/s ≈ _____ mi/min

7. 3.4 mi/h = _____ ft/sec

8. 2.1 yd/min = _____ ft/s

9. 5.6 lb/gal = _____ oz/gal

10. 4 m/h = _____ cm/min

11. 42 cm/s = _____ m/min

12. 4,500 ft/h = _____ ft/s

13. 8 mi/h = _____ ft/min

14. 900 cm/h = _____ cm/min

15. JOGGING Jarin jogs at a rate of 7.5 miles per hour. How many miles per minute does Jarin jog?

16. BUCKETS Alonzo fills buckets at a rate of 6 gallons per minute. What is the rate in pints per hour?

Lesson 1.3 Problem-Solving Practice

Convert Unit Rates

DRIVES Use the table for Exercises 1–2. The table shows the average speeds for drives to the beach.

Average Speeds	
Name	**Speed**
Julie	62 miles per hour
Manalo	311,520 feet per hour
LeShawn	1,448 meters per minute

1. Find LeShawn's average speed in meters per hour.	**2.** List the names and corresponding speeds from least to greatest in miles per hour. *(Hint: 1 mile ≈ 1,610 meters)*
3. VEGETABLES Marilyn ate 320 pounds of vegetables last year. How many ounces did she eat per month? Round to the nearest tenth.	**4. ANIMALS** A chicken can run at a top speed of 9 miles per hour. Find the top speed of a chicken in miles per minute. Round to the nearest tenth.
5. COYOTES The top speed of a coyote is 43 miles per hour. Find the approximate speed in kilometers per minute. *(Hint: 1 mile ≈ 1,610 meters)*	**6. WALK** Heather was out for a leisurely walk at a rate of 3 miles per hour. What was her speed in yards per minute?
7. POOL A pool is being drained at a rate of 120 gallons per minute. What is this rate in quarts per hour?	**8. MILK** The Prichard family drinks 2 quarts of milk per day. How many gallons of milk do they drink in a week?

Lesson 1.4 Skills Practice

Proportional and Nonproportional Relationships

For Exercises 1–3, use the table of values. Write the ratios in the table to show the relationship between each set of values.

1.

Number of Hours	1	2	3	4
Total Amount Earned	$15	$30	$45	$60
Ratios				

2.

Number of Packages	1	2	3	4
Total Cost	$11	$20	$29	$38
Ratios				

3.

Number of Classrooms	1	2	3	4
Total Students	24	48	72	92
Ratios				

For Exercises 4–8 use the table of values. Write *proportional* or *nonproportional.*

4.

Number of Hours	1	2	3	4
Total Amount Earned	$0.99	$1.98	$2.97	$3.96

5.

Number of Hours	1	2	3	4
Total Amount Earned	$17.25	$35.50	$50.75	$70

6.

Number of Hours	1	2	3	4
Number of Pages Read in Book	37	73	109	145

7.

Number of Lunches	1	2	3	4
Total Cost	$2.75	$5.50	$8.25	$11

8. Fred is ordering pies for a family reunion. Each pie costs $4.50. For orders smaller than a dozen pies, there is a $5 delivery charge. Is the cost proportional to the number of pies ordered? Use a table of values to explain your reasoning.

Lesson 1.4 Problem-Solving Practice

Proportional and Nonproportional Relationships

1. SPORTS A touchdown is worth 6 points. Additionally you score an extra point if you can kick a field goal. Is the total number of points scored proportional to the number of touchdowns?	**2. RECREATION** An outdoor swimming pool costs $8 per day to visit during the summer. There is also a $25 yearly registration fee. Is the total cost proportional to the total number of days visited?
3. SCHOOL At a certain middle school, there are 26 students per teacher in every homeroom. Is the total number of students proportional to the number of teachers?	**4. TEAMS** A baseball club has 18 players for every team, with the exception of four teams that have 19 players each. Is the number of players proportional to the number of teams?
5. MONEY At the beginning of the summer, Conan had $180 in the bank. Each week he deposits another $64 that he earns mowing lawns. Is his account balance proportional to the number of weeks since he started mowing lawns?	**6. SHELVES** A bookshelf holds 43 books on each shelf. Is the total number of books proportional to the number of shelves in the bookshelf?

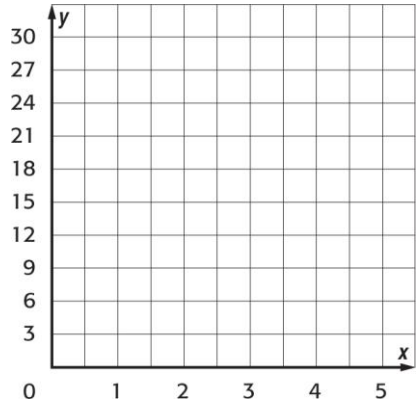
Lesson 1.5 Skills Practice

Graph Proportional Relationships

Determine whether the relationship between the two quantities shown in each table are proportional by graphing on the coordinate plane.

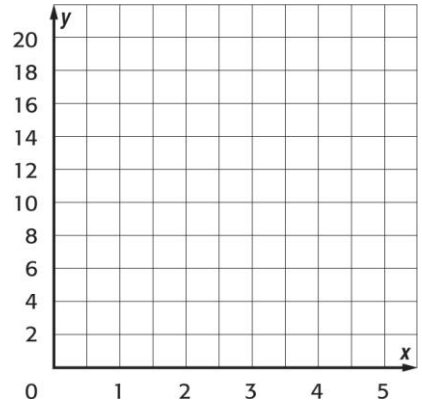
1.

Volume of a Cube	
Side Length (ft)	**Volume (ft^3)**
1	1
2	8
3	27



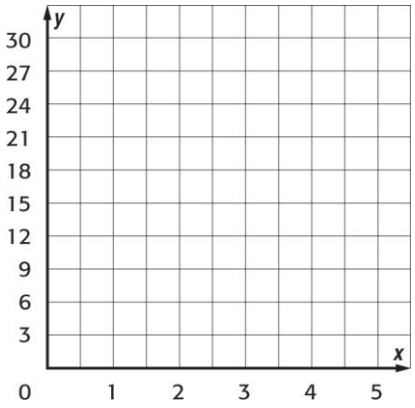
2.

DVD Rental	
Number of DVDs	**Cost ($)**
1	7
2	9
3	11



3.

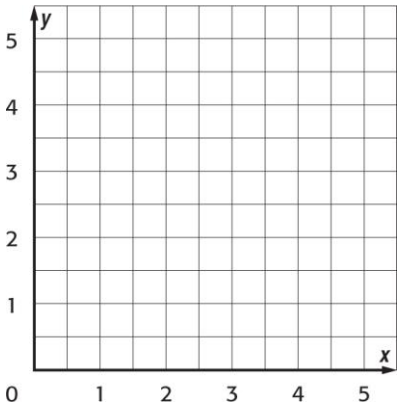
Gallons of Gas Used Per Hour	
Number of Hours	**Gallons of Gas**
3	15
4	20
5	25



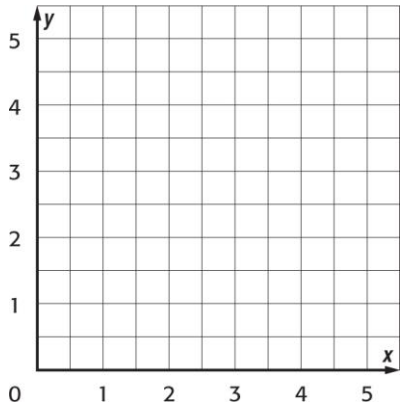
Lesson 1.5 Problem-Solving Practice

Graph Proportional Relationships

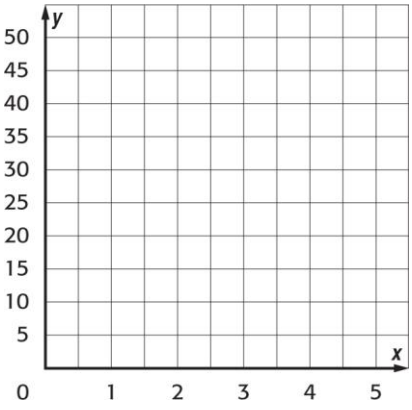
1. BAKING Rachel baked 3 cakes in 2 hours, 4 cakes in 3 hours, and 5 cakes in 4 hours. Determine whether the number of cakes baked is proportional to the number of hours.



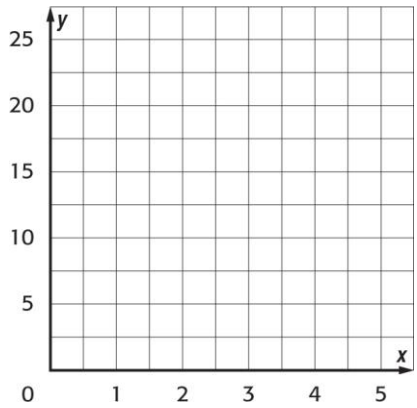
2. RAINFALL It rained 2 inches in one hour, then after two hours, it had rained a total of 3 inches. After four hours, it had rained a total of 5 inches. Determine whether the number of inches of rainfall is proportional to the number of hours.



3. CALORIES A person can burn 8 Calories per minute of running. Determine whether the number of Calories is proportional to the number of minutes.



4. PROFIT If Stephanie sells 3 necklaces, she earns a profit of $5. If she sells 4 necklaces, her profit is $10. Five necklaces sold gives her a profit of $15 and six necklaces sold gives her a profit of $20. Determine whether the amount of profit is proportional to the number of necklaces sold.



Lesson 1.6 Skills Practice

Solve Proportional Relationships

Determine whether each pair of ratios form a proportion.

1. $\frac{5}{8}, \frac{2}{3}$

2. $\frac{7}{3}, \frac{14}{6}$

3. $\frac{6}{8}, \frac{9}{12}$

4. $\frac{16}{9}, \frac{11}{6}$

5. $\frac{55}{10}, \frac{12}{2}$

6. $\frac{6}{8}, \frac{15}{20}$

7. $\frac{5}{9}, \frac{15}{27}$

8. $\frac{3}{18}, \frac{11}{66}$

9. $\frac{7}{11}, \frac{15}{23}$

10. $\frac{9}{13}, \frac{13}{17}$

11. $\frac{3}{42}, \frac{5}{70}$

12. $\frac{6}{7}, \frac{36}{49}$

13. $\frac{4}{12} = \frac{y}{9}$

14. $\frac{6}{18} = \frac{4}{c}$

15. $\frac{7}{z} = \frac{84}{12}$

16. $\frac{5}{10} = \frac{8}{w}$

17. $\frac{x}{9} = \frac{4}{15}$

18. $\frac{6}{20} = \frac{y}{5}$

19. $\frac{5}{9} = \frac{6}{r}$

20. $\frac{8}{n} = \frac{10}{7}$

21. $\frac{d}{5} = \frac{12}{80}$

22. $\frac{y}{5} = \frac{13}{10}$

23. $\frac{2}{28} = \frac{p}{35}$

24. $\frac{11}{t} = \frac{100}{11}$

25. $\frac{1.2}{m} = \frac{3}{5}$

26. $\frac{0.9}{0.5} = \frac{a}{10}$

27. $\frac{3}{7} = \frac{k}{4.2}$

28. $\frac{6.3}{X} = \frac{18}{5}$

29. $\frac{3.6}{12} = \frac{b}{0.5}$

30. $\frac{14}{1.5} = \frac{4.2}{y}$

Lesson 1.6 Problem-Solving Practice

Solve Proportional Relationships

1. USAGE A 12-ounce bottle of shampoo lasts Enrique 16 weeks. How long would you expect an 18-ounce bottle of the same brand to last him?	**2. COMPUTERS** About 13 out of 20 homes have a personal computer. On a street with 60 homes, how many would you expect to have a personal computer?
3. SNACKS A 6-ounce package of fruit snacks contains 45 pieces. How many pieces would you expect in a 10-ounce package?	**4. TYPING** Ingrid types 3 pages in the same amount of time that Tanya types 4.5 pages. If Ingrid and Tanya start typing at the same time, how many pages will Tanya have typed when Ingrid has typed 11 pages?
5. SCHOOL A grading machine can grade 48 multiple-choice tests in 1 minute. How long will it take the machine to grade 300 tests?	**6. AMUSEMENT PARKS** The waiting time to ride a roller coaster is 20 minutes when 150 people are in line. How long is the waiting time when 240 people are in line?
7. PRODUCTION A shop produces 39 wet suits every 2 weeks. How long will it take the shop to produce 429 wet suits?	**8. FISH** Of the 50 fish that Alan caught from the lake, 14 were trout. The estimated population of the lake is 7,500 fish. About how many trout would you expect to be in the lake?

Proportions

Date_____ Period____

State if each pair of ratios forms a proportion.

1) $\frac{4}{2}$ and $\frac{20}{6}$

2) $\frac{3}{2}$ and $\frac{18}{8}$

3) $\frac{4}{3}$ and $\frac{16}{12}$

4) $\frac{4}{3}$ and $\frac{8}{6}$

5) $\frac{12}{24}$ and $\frac{3}{4}$

6) $\frac{6}{9}$ and $\frac{2}{3}$

Solve each proportion.

7) $\frac{10}{k} = \frac{8}{4}$

8) $\frac{m}{10} = \frac{10}{3}$

9) $\frac{2}{x} = \frac{7}{9}$

10) $\frac{3}{x} = \frac{7}{10}$

11) $\frac{4}{9} = \frac{2}{x}$

12) $\frac{6}{a} = \frac{3}{8}$

13) $\frac{8n}{8} = \frac{8}{3}$

14) $\frac{7}{9} = \frac{a}{5}$

15) $\frac{p}{8} = \frac{13}{2}$

16) $\frac{3}{13} = \frac{v}{3}$

17) $\frac{10}{12} = \frac{2}{n}$

18) $\frac{11}{10} = \frac{r}{11}$

19) $\frac{x}{9} = \frac{7}{14}$

20) $\frac{a}{10} = \frac{11}{14}$

21) $\frac{v}{12} = \frac{10}{2}$

22) $\frac{6}{14} = \frac{5}{n}$

 Name_____

Solving Proportions

Date_____ Period____

Solve each proportion.

1) $\frac{10}{8} = \frac{n}{10}$

2) $\frac{7}{5} = \frac{x}{3}$

3) $\frac{9}{6} = \frac{x}{10}$

4) $\frac{7}{n} = \frac{8}{7}$

5) $\frac{4}{3} = \frac{8}{x}$

6) $\frac{7}{b+5} = \frac{10}{5}$

7) $\frac{6}{b-1} = \frac{9}{7}$

8) $\frac{4}{m-8} = \frac{8}{2}$

9) $\frac{5}{6} = \frac{7n+9}{9}$

10) $\frac{4}{9} = \frac{r-3}{6}$

11) $\frac{7}{9} = \frac{b}{b-10}$

12) $\frac{9}{k-7} = \frac{6}{k}$

13) $\frac{4}{n+2} = \frac{7}{n}$

14) $\frac{n}{n-3} = \frac{2}{3}$

15) $\frac{x-3}{x} = \frac{9}{10}$

16) $\frac{5}{r-9} = \frac{8}{r+5}$

17) $\frac{p+10}{p-7} = \frac{8}{9}$

18) $\frac{2}{8} = \frac{n+4}{n-4}$

19) $\frac{n-5}{n+8} = \frac{2}{7}$

20) $\frac{n-6}{n-7} = \frac{9}{2}$

Lesson 1.7 Skills Practice

Constant Rate of Change

Find the constant rate of change for each table.

1.

Time Spent Mowing (h)	Money Earned ($)
1	10
3	30
5	50
7	70

2.

Time	Temperature (°F)
9:00	60
10:00	62
11:00	64
12:00	66

3.

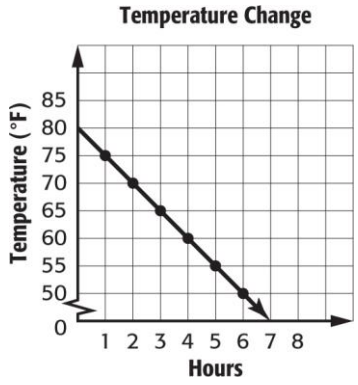
Number of Students	Number of Magazines Sold
10	100
15	150
20	200
25	250

4.

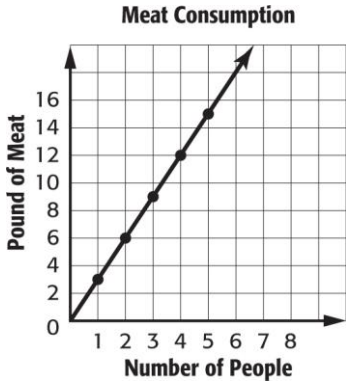
Number of Trees	Number of Apples
5	100
10	200
15	300
20	400

Find the constant rate of change for each graph.

5.



6.



Lesson 1.7 Problem-Solving Practice

Constant Rate of Change

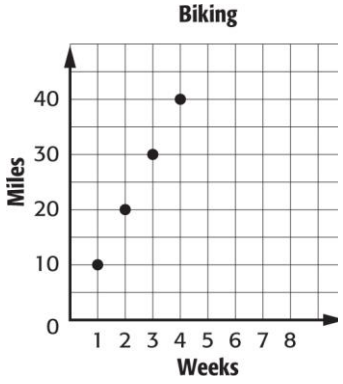
1. WATER At 2 P.M., the level of the water in the pool was 10 feet. At 6 P.M., the level of water was 2 feet. Find the constant rate of change of the water.

2. MONEY JoAnne is depositing money into a bank account. After 3 months there is $150 in the account. After 6 months, there is $300 in the account. Find the constant rate of change of the account.

3. TEMPERATURE The temperature at noon was 88°F. By 4 P.M., the temperature was 72°F. Find the constant rate of change of the temperature.

4. GROWTH Jaz was 43 inches tall. Eighteen months later, she was 52 inches tall. Find the constant rate of change for Jaz's height.

5. BIKING The graph represents how far Toby biked given the number of weeks he has been biking. Find the constant rate of change.



6. HAIR Find the constant rate of change.

Months	4	5	6	7
Length (in.)	8	10	12	14

Lesson 2.1 Skills Practice

Percent of a Number

Find each number.

1. Find 80% of 80.

2. What is 95% of 600?

3. 35% of 20 is what number?

4. Find 60% of $150.

5. What is 75% of 240?

6. 380% of 30 is what number?

7. Find 40% of 80.

8. What is 30% of $320?

9. 12% of 150 is what number?

10. Find 58% of 200.

11. What is 18% of $450?

12. What is 70% of 1,760?

13. Find 92% of 120.

14. 45% of 156 is what number?

15. What is 12% of 12?

16. Find 60% of 264.

17. 37.5% of 16 is what number?

18. What is 82.5% of 400?

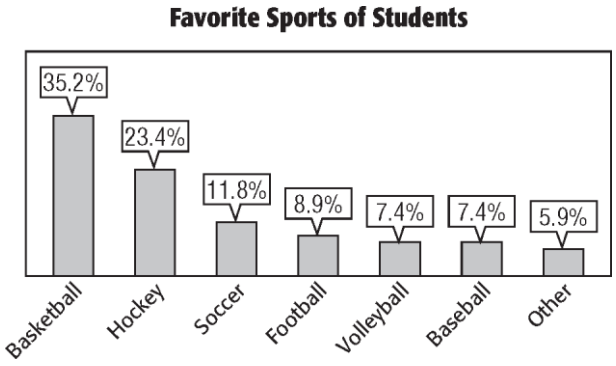
19. What is 0.25% of 900?

20. Find 1.5% of 220.

Lesson 2.1 Problem Solving Skills
Percent of a Number

SPORTS For Exercises 1 and 2, use the graph below. It shows the results of a poll of 440 ninth-grade students. Round answers to the nearest whole number.

PETS For Exercises 3 and 4, use the table below. It shows the pet ownership in a town of 1,650 households. Round answers to the nearest whole number.



Pets in Household	Percent
At least one dog or cat	26.7
At least one dog	19.9
At least one cat	13
At least one dog and one cat	6.19

1. Write the percent as a fraction to find how many students surveyed chose hockey as their favorite sport.
Solve.

2. How many students surveyed chose basketball as their favorite sport?

3. Write the percent as a decimal to find how many households have at least one dog. Solve.

4. How many households have at least one dog and one cat?

5. VOTING Going into a recent election, only about 62% of people old enough to vote were registered. In a community of about 55,200 eligible voters, how many people were registered?

6. COLLEGE A local college recently reported that enrollment increased to 108% percent of last year. If enrollment last year was at 17,113, about how many students enrolled this year? Round to the nearest whole number.

Lesson 2.2 Skills Practice

Percent and Estimation

Estimate by using fractions.

1. 51% of 128

2. 76% of 200

3. 32.9% of 90

4. 23% of 8

5. 19% of 45

6. 81% of 16

Estimate by using 10%.

7. 12% of 98

8. 89% of 300

9. 31% of 80

10. 28% of 49

11. 62% of 13

12. 77% of 28

Estimate.

13. 308% of 500

14. 0.5% of 87

15. 153% of 20

16. 0.6% of 41

17. 231% of 54

18. 0.9% of 116

19. 0.26% of 36

20. 425% of 119

Lesson 2.2 Problem-Solving Practice

Percent and Estimation

1. ORCHESTRA The orchestra at Millard Middle School has 120 members. Of these, 17% are eighth-grade students. Estimate the number of eighth-grade students in the orchestra.	**2. RESTAURANTS** In one west coast city, 34% of the restaurants are on the river. The city has 178 restaurants. Estimate the number of restaurants that are on the river.
3. FARMING Rhonda planted green beans on 67% of her farm. Rhonda's farm has 598 acres of land. Estimate the number of acres of green beans on Rhonda's farm.	**4. HOTELS** At the Eastward Inn hotel, 47% of the rooms face the pool. The hotel has 92 rooms. Estimate the number of rooms that face the pool.
5. TREES The students in Leon's seventh grade science class determined that 42% of the trees at a local park are pine trees. If there are 632 trees in the park, about how many of them are pine trees?	**6. BOOKS** Jenna has read 0.7% of a book. If the book has 431 pages, estimate the number of pages Jenna has read.
7. FITNESS At the office where Mika works, 40% of the 18 employees exercise at least three times a week. Estimate the number of people who exercise at least three times a week.	**8. PETS** Of all seventh-grade students at Hart Middle School, 0.3% of the students own a pet iguana. If there are 610 seventh–grade students at Hart, about how many own pet iguanas?

Lesson 2.3 Skills Practice

The Percent Proportion

Find each number. Round to the nearest tenth if necessary.

1. 50 is 20% of what number?

2. What percent of 20 is 4?

3. What number is 70% of 250?

4. 10 is 5% of what number?

5. What number is 45% of 180?

6. 40% of what number is 82?

7. What percent of 90 is 36?

8. 60 is 25% of what number?

9. What number is 32% of 1,000?

10. What percent of 125 is 5?

11. 73 is 20% of what number?

12. 57% of 109 is what number?

13. What percent of 185 is 35?

14. 25 is what percent of 365?

15. 85% of 190 is what number?

16. 12.5 is 25% of what number?

17. What percent of 128 is 24?

18. 5.25% of 170 is what number?

19. What is 82% of 230?

20. What percent of 49 is 7?

Lesson 2.3 Problem-Solving Practice

The Percent Proportion

1. **DRIVING** Mudrik installed a device on his car that guaranteed to increase his gas mileage by 15%. He currently gets 22 miles per gallon. How much will the gas mileage increase after installing the device?	2. **POPULATION** The number of students at Marita's school decreased to 98% of last year's number. Currently, there are 1,170 students. How many students were there last year? Round to the nearest whole number.
3. **VOTING** Yolanda's club has 35 members. Its rules require that 60% of them must be present for any vote. At least how many members must be present to have a vote?	4. **GARBAGE** This month, Chun's office produced 690 pounds of garbage. Chun wants to reduce the weight of garbage produced to 85% of the weight produced this month. What is the target weight for the garbage produced next month?
5. **SALARIES** Yara just received a 6% raise in salary. Before the raise, she was making $52,000 per year. How much more will Yara earn next year?	6. **SPORTS** Sally's soccer team played 25 games and won 17 of them. What percent did the team win?

Lesson 2.4 Skills Practice

The Percent Equation

Write an equation for each problem. Then solve. Round to the nearest tenth if necessary.

1. 25% of 176 is what number?

2. What is 90% of 20?

3. 24 is what percent of 30?

4. 80% of what number is 94?

5. What is 60% of 45?

6. 9 is what percent of 30?

7. What percent of 125 is 25?

8. What is 120% of 20?

9. 2% of what number is 5?

10. 15% of 290 is what number?

11. 16 is what percent of 4,000?

12. What is 140% of 60?

13. 344.8 is what percent of 862?

14. 6% of what number is 21?

15. What number is 60% of 605?

16. 32% of 250 is what number?

17. Find 30% of 70.

18. What is 80% of 65?

Lesson 2.4 Problem-Solving Practice

The Percent Equation

1. DINING Jonas and Norma's restaurant bill comes to $23.40. They are planning to tip the waiter 15% of their bill. How much money should they leave for a tip?	**2. CHESS** The Briarwood Middle School chess club has 55 members. 22 of the members are in seventh grade. What percent of the members of the chess club are in seventh grade?
3. TENNIS In the city of Springfield, 75% of the parks have tennis courts. If 15 parks have tennis courts, how many parks does Springfield have altogether?	**4. COLLEGE** There are 225 students in eighth grade at Jefferson Middle School. A survey shows that 64% of them are planning to attend college. How many Jefferson eighth–grade students are planning to attend college?
5. BASEBALL In a recent season, the Chicago White Sox won 99 out of 162 games. What percent of games did the White Sox win? Round to the nearest tenth if necessary.	**6. HOUSING** In the Stoneridge apartment complex, 35% of the apartments have one bedroom. If there are 49 one–bedroom apartments, what is the total number of apartments at Stoneridge?
7. SPACE On Mars, an object weighs 38% as much as on Earth. How much would a person who weighs 165 pounds on Earth weigh on Mars?	**8. FOOTBALL** Javier had 2 passes intercepted out of 17 attempts in his last football game. What percent of Javier's passes were intercepted? Round to the nearest tenth if necessary.

 Name_____

Percent Word Problems

Date_____ Period____

Solve each problem.

1) What percent of 126 is 22?

2) 81 is 56% of what?

3) 25.7 is what percent of 141?

4) 17% of what is 156?

5) 46 is what percent of 107?

6) 79.9 is 99% of what?

7) 62% of what is 89.3?

8) What percent of 137.4 is 96?

9) 30% of 117 is what?

10) 11 is what percent of 97?

11) 120% of 118 is what?

12) 25 is what percent of 37?

13) What is 270% of 60?

14) 73% of what is 156.4?

15) 87% of 41 is what?

16) 9 is what percent of 84?

17) What percent of 88.6 is 70?

18) What percent of 137 is 86?

Lesson 2.5 Skills Practice

Percent of Change

Find each percent of change. Round to the nearest whole percent if necessary. State whether the percent of change is an *increase* or *decrease*.

1. original: 35
new: 70

2. original: 8
new: 12

3. original: 45
new: 30

4. original: $350
new: $400

5. original: $75
new: $60

6. original: 250
new: 100

7. original: $30
new: $110

8. original: 35
new: 28

9. original: $12.50
new: $15

10. original: 80
new: 52

11. original: 45
new: 63

12. original: 120
new: 132

13. original: $210
new: $105

14. original: 84
new: 111

15. original: $84
new: $100

16. original: 6.8
new: 8.2

17. original: 1.5
new: 2.5

18. original: 91
new: 77

19. original: $465.50
new: $350

20. original: $87.05
new: $100

21. original: 144
new: 108

22. original: 20.8
new: 12.2

23. original: $75
new: $15

24. original: 8.6
new: 7

Lesson 2.5 Problem-Solving Practice

Percent of Change

1. SHOES A popular brand of running shoes costs a local store $68 for each pair. If the store sells the shoes for $119, what is the percent of increase in the price?	**2. CLUBS** Last year the backgammon club had 30 members. This year the club has 24 members. Find the percent of decrease in the number of members.
3. READING In the seventh grade, Rachel read 15 books. In the eighth grade, she read 18 books. Find the percent of increase in the number of books Rachel read.	**4. VOTES** Last year 762 students voted in the student council election at San Bruno Middle School. This year 721 students voted. What was the percent of change in the number of students that voted to the nearest tenth?
5. HEIGHT When Ricardo was 9 years old, he was 56 inches tall. Ricardo is now 12 years old and he is 62 inches tall. Find the percent of increase in Ricardo's height to the nearest tenth.	**6. PLANTS** Alicia planted 45 tulip bulbs last year. This year she plans to plant 65 bulbs. Find the percent of increase in the number of tulip bulbs to the nearest tenth.
7. PICTURES The 2008 yearbook at Middleton Middle School had 236 candid pictures of students. The 2007 yearbook had 214 candid pictures of students. What was the percent of change in the number of candid student pictures from 2007 to 2008 to the nearest tenth?	**8. POPULATION** In 2000, Florida's population was 15.9 million. In 2008, the population was estimated to be 18.8 million. Find the percent of increase to the nearest whole number.

Percent of Change

Date_____ Period____

Find each percent change to the nearest percent. State if it is an increase or a decrease.

1) From 45 ft to 92 ft

2) From 74 hours to 85 hours

3) From 74 ft to 75 ft

4) From 36 inches to 90 inches

5) From 94 miles to 34 miles

6) From 12 ft to 23 ft

7) From 83 hours to 76 hours

8) From 24 grams to 96 grams

9) From 20 tons to 99 tons

10) From 16 tons to 72 tons

11) From 117 minutes to 91 minutes

12) From 188 m to 42 m

13) From 362 m to 156 m

14) From 139 minutes to 385 minutes

15) From $328 to $333

16) From 259 hours to 274 hours

17) From 284 grams to 206 grams

18) From $246 to $221

19) From 309 grams to 299 grams

20) From 326 ft to 241 ft

21) From 4048 minutes to 7548 minutes

22) From 2150 miles to 7895 miles

23) From 4359 ft to 5377 ft

24) From 5876 m to 6820 m

Lesson 2.6 Skills Practice

Sales Tax, Tips, and Markup

Find the total cost to the nearest cent.

1. $49.95 CD player; 5% tax

2. $69 shoes; 6% tax

3. $37 dinner; 15% tip

4. $2.99 socks; 5.5% markup

5. $115 coat; 7% tax

6. $15 lunch; 20% tip

7. $299 DVD player; 7% tax

8. $43 shirt; 6% tax

9. $16 haircut; 15% tip

10. $8.75 breakfast; 15% tip

11. $47 tie; 4.5% markup

12. $40.80 dinner; 17% tip

13. $52 lunch; 20% tip

14. $18.99 CD; 6% markup

15. $22 haircut; 20% tip

16. $128 catered dinners; 18% tip

Lesson 2.6 Problem-Solving Practice

Sales Tax, Tips, and Markup

1. SKATEBOARDS Inez wants to buy a skateboard but she does not know if she has enough money. The price of the skateboard is $80 and the sales tax is 7%. What will be the total cost of the skateboard?

2. HAIRCUT Josiah went to the local barber to get his hair cut. It cost $18 for the haircut. Josiah tipped the barber 15%. What was the total cost of the haircut including the tip?

3. MEAL Madeline took 3 friends out for dinner. The cost of the meals was $46.50. She left a 20% tip. What was the total cost including the tip?

4. COMPUTERS Andrea ordered a computer on the Internet. The computer cost $1,399 plus $6\frac{1}{2}$% sales tax. What was the total amount Andrea paid for her computer?

5. MAGAZINES Ivan bought these two magazines. If the sales tax was 6.75%, what was the total amount that he paid for the magazines?

$4.95

$4.95

6. CATERED DINNER The Striton family had a meal catered for a wedding rehearsal dinner. The cost of the dinner was $476. There was a 5% sales tax and they left a 15% tip. What was the total cost including the sales tax and the tip?

Lesson 2.7 Skills Practice

Discount

Find the sale price to the nearest cent.

1. $89.95 DVD player; 5% discount

2. $75 dress shirt; 20% discount

3. $14 socks; 15% discount

4. $2.99 toy; 30% discount

5. $140 coat; 10% discount

6. $65 dress pants; 20% discount

7. $325 tent; 15% discount

8. $80 boots; 25% discount

9. $45.50 book; 30% discount

10. $52 tie; 50% discount

11. $35 volleyball; 20% discount

12. $490 stove; 15% discount

13. $299 bicycle; 10% discount

14. $32 shorts; 50% discount

15. $5 box of cereal; 40% discount

16. $45 shelf; 35% discount

Lesson 2.7 Problem-Solving Practice

Discount

1. PRETZELS The Spanish club sold hot pretzels as a fundraiser. The pretzels normally sold for $2.00, but near the end of the sale the price was reduced by 25%. What was the new price for a hot pretzel?	**2. CELL PHONES** Nathan is buying a cell phone for his business. The regular price of the cell phone is $179. If he buys the phone in the next 2 weeks, he will get a 20% discount. What will be the sale price if he buys the phone tomorrow? 
3. ALARM CLOCK Dominic bought a new alarm clock that was on sale for $18.75. If this price represents a 30% discount from the original price, what is the original price to the nearest cent?	**4. FISHING ROD** Malachi bought a new fishing rod. The regular price of the fishing rod was $125.99. He bought it on sale with a 15% discount. Sales tax of 3% is applied to the discounted total. What was the sale price with tax of Malachi's fishing rod to the nearest cent?
5. JEWELRY A jewelry store is having a 50% off sale for all necklaces. During this sale, what is the cost of a necklace that regularly costs $49.98?	**6. COSMETICS** Jaylynn was buying new mascara. She bought it on sale for $5.56. If the price represents a 20% discount from the original price, what is the original price to the nearest cent?

Name_____

Markup, Discount, and Tax

Date_____ Period____

Find the selling price of each item.

1) Cost of a sled: $99.50
Markup: 95%

2) Cost of a comic book: $3.95
Markup: 20%

3) Cost of an oil change: $18.00
Markup: 70%

4) Cost of a CD: $14.50
Markup: 30%

5) Cost of an MP3 player: $129.50
Markup: 60%

6) Cost of an oil change: $21.95
Markup: 65%

7) Cost of a pen: $0.95
Markup: 60%

8) Cost of a computer: $1,850.00
Markup: 75%

9) Original price of concert tickets: $100.00
Discount: 21%

10) Original price of a book: $18.50
Discount: 45%

11) Original price of a telescope: $99.99
Discount: 13%

12) Original price of a CD: $22.99
Discount: 5%

13) Original price of a sled: $99.50
Discount: 50%

14) Original price of a camera: $554.99
Discount: 48%

15) Original price of a CD: $17.00
Discount: 50%

16) Original price of a CD: $22.95
Discount: 10%

17) Original price of a book: $49.95
Tax: 3%

18) Original price of a book: $90.50
Tax: 4%

19) Original price of an MP3 player: $99.50
Tax: 4%

20) Original price of a microphone: $129.99
Tax: 1%

21) Original price of a pen: $1.50
Tax: 4%

22) Original price of shorts: $19.99
Tax: 2%

23) Original price of an SUV: $42,000.00
Tax: 3%

24) Original price of a goldfish: $1.50
Tax: 5%

 Name_____

Markup, Discount, and Tax (Harder)

Date_____ Period____

Find the selling price of each item.

1) Cost of shoes: $29.95
Markup: 20%
Tax: 2%

2) Cost of a microscope: $269.95
Markup: 43%
Tax: 5%

3) Cost of a goldfish: $3.45
Markup: 29%
Tax: 2%

4) Cost of shoes: $99.99
Markup: 9%
Tax: 4%

5) Cost of a shirt: $14.95
Markup: 25%
Discount: 45%

6) Cost of a CD: $23.50
Markup: 63%
Discount: 50%

7) Cost of a puppy: $349.99
Markup: 41%
Discount: 23%

8) Cost of an oil change: $19.95
Markup: 85%
Discount: 48%

9) Original price of a microphone: $20.00
Discount: 42%
Tax: 6%

10) Original price of a jacket: $269.50
Discount: 24%
Tax: 6%

11) Original price of a lizard: $39.99
Discount: 40%
Tax: 6%

12) Original price of a microphone: $49.99
Discount: 5%
Tax: 5%

13) Cost of a hat: $10.50
Markup: 10%
Discount: 40%
Tax: 5%

14) Cost of a pen: $1.95
Markup: 70%
Discount: 40%
Tax: 5%

15) Cost of a computer game: $4.99
Markup: 40%
Discount: 55%
Tax: 1%

16) Cost of a hat: $31.50
Markup: 35%
Discount: 30%
Tax: 1%

Lesson 2.8 Skills Practice

Financial Literacy

Find the simple interest earned to the nearest cent for each principal, interest rate, and time.

1. \$500, 4%, 2 years

2. \$350, 6.2%, 3 years

3. \$740, 3.25%, 2 years

4. \$725, 4.3%, $2\frac{1}{2}$ years

5. \$955, 6.75%, $3\frac{1}{4}$ years

6. \$1,540, 8.25%, 2 years

7. \$3,500, 4.2%, $1\frac{3}{4}$ years

8. \$568, 16%, 8 months

Find the simple interest paid to the nearest cent for each loan, interest rate, and time.

9. \$800, 9%, 4 years

10. \$280, 5.5%, 4 years

11. \$1,150, 7.6%, 5 years

12. \$266, 5.2%, 3 years

13. \$450, 22%, 1 year

14. \$2,180, 7.7%, $2\frac{1}{2}$ years

15. \$2,650, 3.65%, $2\frac{1}{2}$ years

16. \$1,245, 5.4%, 6 months

Lesson 2.8 Problem Solving Practice

Financial Literacy

1. **SAVINGS ACCOUNT** How much interest will Hannah earn in 4 years if she deposits $630 in a savings account at 6.5% simple interest?	2. **INVESTMENTS** Terry invested $2,200 in the stock market for 2 years. If the investment earned 12%, how much money did Terry earn in 2 years?
3. **RETIREMENT** Mr. Pham has $410,000 in a retirement account that earns 3.85% simple interest each year. Find the amount earned each year by this investment.	4. **COLLEGE FUND** When Melissa was born, her parents put $8,000 into a college fund account that earned 9% simple interest. Find the total amount in the account after 18 years.
5. **LOTTERY** Raj won $900,000 in a regional lottery. After paying $350,000 in taxes, he invested the remaining money in a savings account at 4.25% simple interest. How much money is in the account if Raj makes no deposits or withdrawals for two years?	6. **SAVINGS** Mona opened a savings account with a $500 deposit and a simple interest rate of 5.6%. If there were no deposits or withdrawals, how much money is in the account after 8 $\frac{1}{2}$ years?
7. **SAVINGS ACCOUNT** Malik deposited $1,050 in a savings account, and it earned $241.50 in simple interest after four years. Find the interest rate on Malik's savings account.	8. **INHERITANCE** Kelli Rae's inheritance from her great–grandmother was $220,000 after taxes. If Kelli Rae invests this money in a savings account that earns $18,260 in simple interest every year, what is the interest rate on her account?

 Name_____

Simple and Compound Interest

Date_____ Period____

Use simple interest to find the ending balance.

1) $34,100 at 4% for 3 years

2) $210 at 8% for 7 years

3) $4,000 at 3% for 4 years

4) $20,600 at 8% for 2 years

5) $14,000 at 6% for 9 years

6) $2,300 at 7% for 9 years

7) $43,800 at 4.8% for 2 years

8) $35,800 at 8.2% for 3 years

9) $7,400 at 10.5% for $\frac{1}{4}$ years

10) $1,900 at 5.9% for $2\frac{3}{4}$ years

Find the total value of the investment after the time given.

11) $7,300 at 7% compounded semiannually for 3 years

12) $1,030 at 4% compounded semiannually for 2 years

13) $18,000 at 9% compounded semiannually for 6 years

14) $1,500 at 7% compounded annually for 3 years

15) $1,240 at 8% compounded annually for 2 years

16) $55,000 at 16% compounded semiannually for 2 years

17) $28,600 at 7.9% compounded semiannually for 2 years

18) $21,000 at 13.6% compounded quarterly for 4 years

19) $12,700 at 8.8% compounded semiannually for 1 year

20) $130 at 9.4% compounded quarterly for 2 years