## ACTIVITY 4.1

1. In Britain, about 7.5 million people have cats as pets, and 6.1 million have dogs. Write 2 different ratios that could be made from this information. Explain your ratios.

2. On a class field trip, there are 5 teachers, 117 students, and 16 parents. What does the ratio 21:138 represent?

3. Which of the following are equal ratios?

   A. 3:5 and 6:15   **B.** 2:4 and 6:8
   C. 3:4.5 and 5:7.5   **D.** 2:3 and 4:5

4. Use the graph to write a ratio showing the relationship between number of hours Sam babysits and the money he earns.

Money Earned Babysitting
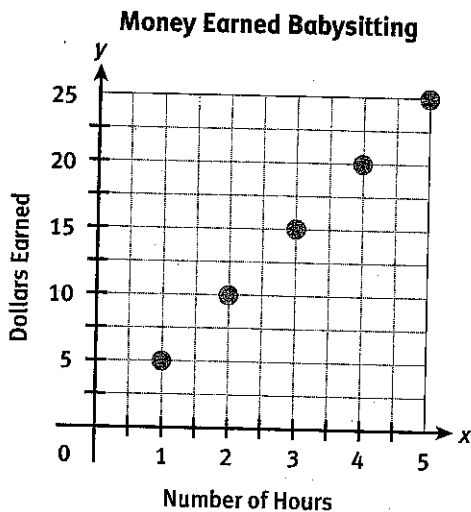
5. For working 11 hours you are paid $93.50. How much money do you make per hour?

6. Jim drove from Exit 32 on the highway to Exit 170 in 2 hours. Exits 32 and 170 are 138 miles apart. Did Jim follow the speed limit of 65 mph? Explain how you know.

7. Which is the better deal, 8 songs for $7.52 or 5 songs for $4.75? Explain how you know.

8. In April 1897, John J. McDermott won the first Boston Marathon, which was only 24.5 miles instead of 26 miles as it is today. He ran it in 175 minutes. Find his unit rate.

ACTIVITY 4.2

9. At Lake Middle School, the average ratio of boys to girls in a classroom is 3:2.

   a. Use a proportion to predict the number of girls in a classroom that has 15 boys.

   b. Hunter actually counted the number of boys and girls in his class at Lake Middle School, and found there were 14 boys and 9 girls. How close is the actual ratio to the ratio found using proportions? Does using proportions give a reasonable estimate of boys and girls?

   c. Why are the values found in Parts a and b not the same?

10. Solve $\frac{x}{42} = \frac{3}{7}$ using two different strategies. Explain each strategy.

11. Complete the ratio table to show ratios equivalent to 16:10.

48	160		8	
		20		90

12. Use the following graph to make predictions.

Chocolate Chips in Pancakes
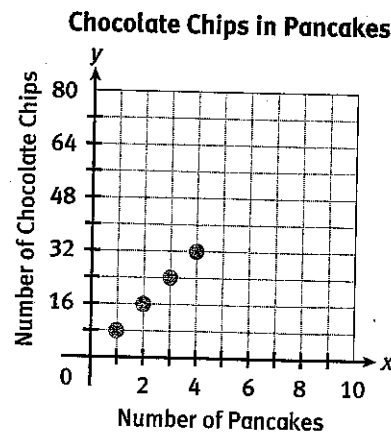
   a. Use the graph to predict the number of chocolate chips in 9 pancakes. Explain.

b. Use the graph to predict the number of pancakes that would have 48 chocolate chips. Explain.

13. Is the ratio 4.2:1.5 proportional to the ratio 12.6:4.5? Explain.

ACTIVITY 4.3

14. A group of 100 apples and bananas are shown below. Express the number of bananas in the group using a fraction, decimal, and percent.
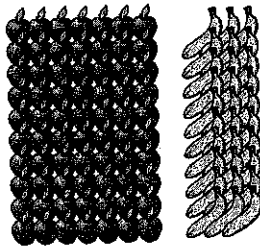
15. Copy and complete the table below by filling in missing amounts, shading figures, and plotting on the number line. Write ratios using a colon (:) to represent part to whole relationships.

Figure	Ratio	Fraction	Decimal	Percent
		$\frac{1}{4}$		
			0.3	
	7:10			
				100%

16. Replace each bold number in the fun facts below with a percent.

a. **0.95** of a jellyfish is water.

b. $\frac{1}{4}$ of all the bones in your body are in your feet.

c. About **0.183** of people let their pets sleep in their bed.

d. About $\frac{8}{21}$ of America is wilderness.

e. Pizzerias make up about $\frac{8}{47}$ of all restaurants.

17. Put the following amounts in order from greatest to least: 43%, $\frac{3}{7}$, 0.453. Explain your reasoning.

18. Estimate the percent of the smiley face that is NOT shaded.

ACTIVITY 4.4

19. Draw 24 identical simple figures. Shade 75% of the figures. Explain how you knew how many to shade.

20. Jack played a video game 18 times and won about 62% of the games. How many games did he win?

21. 22% of the 55 boys in the club wanted to play kickball. Use estimation to tell about how many boys wanted to play kickball.

22. 12 of Derek's 15 pets are fish. What percent of his pets are fish?

23. The news reporter stated that, "About 8% of Americans have diabetes, which is about 24 million people." At the time this statistic was on the news, how many people were there in the U.S.?

24. Use mental math to find each missing amount.

   a. 10% of 1,843

   b. 40% of 120

   c. 15% of 200

   d. 10% of _____ = 17

25. 29% of the 61 shells that Tia found were broken. About how many of the shells were broken?

26. Kay and Lisa spent a day shopping and going to a museum with their mom. At lunch, Kay offered to pay 50% of the lunch bill, which was $28.98, and their mom paid the rest. At dinner, Lisa paid for 50% of the bill, which was $59.50, and their mom paid the rest. Did the girls each pay the same amount? Explain.

ACTIVITY 4.5

27. A picture frame has a price tag of $23.77. At checkout, the total cost of the frame comes to $24.96. What percent sales tax was added? Show how you found your answer.

28. A server receives a tip of $13 on a bill subtotaling $56.90. Was her customer happy with her service? Use percents to explain your thinking.

29. Calculate the total amount due on the restaurant bill shown below.

```
          RECEIPT
January 22            7:15PM
─────────────────────────────
Pasta with Meatballs  $11.35
Milk                   $1.70
Clam Chowder(bowl)     $5.15

Food Total           _____
Tax(5.9%)            _____
Subtotal             _____
Tip Amount(15%)      _____
Total Due            _____
─────────────────────────────
         Thank you!
      CUSTOMER COPY
```

30. Weston has a gift card for $15 to download songs with his computer. Each song costs $0.99 and he wants to buy 16 songs. He has a coupon for 10% off the total and the tax will be 6%. Will the gift card cover the cost of the 16 songs? Explain.

31. Leah borrowed $3,700 at a simple interest rate of 6.9% to buy a used car. If the loan is for 2 years, how much money must she repay?

32. Merry deposits $1,200 in a bank account and does not add to it or make any withdrawals. After 3 years she withdraws all of her money and has $1,430.40. What percent simple interest did the bank give? Show your work.

33. Juan deposits $500 in a simple interest account offering 5.9%. After 6 months, he deposits another $350. How much money will Juan earn in interest at the end of 1 year?

34. Which is the better option for a customer, to have 25% taken off each item purchased, or to have 25% taken off the total cost? Explain.

Reflection

An important aspect of growing as a learner is to take the time to reflect on your learning. It is important to think about where you started, what you have accomplished, what helped you learn, and how you will apply your new knowledge in the future. Use notebook paper to record your thinking on the following topics and to identify evidence of your learning.

Essential Questions

1. Review the mathematical concepts and your work in this unit before you write thoughtful responses to the questions below. Support your responses with specific examples from concepts and activities in the unit.

   ● Why are proportional relationships an important part of mathematics?

   ● How is percent related to fractions and decimals, and why is it such a useful tool in everyday life?

Academic Vocabulary

2. Look at the following academic vocabulary words:

   ● percent   ● unit rate

   ● rate

   Choose three words and explain your understanding of each word and why each is important in your study of math.

Self-Evaluation

3. Look through the activities and Embedded Assessments in this unit. Use a table similar to the one below to list three major concepts in this unit and to rate your understanding of each.

Unit Concepts	Is Your Understanding Strong (S) or Weak (W)?
Concept 1	
Concept 2	
Concept 3	

   a. What will you do to address each weakness?

   b. What strategies or class activities were particularly helpful in learning the concepts you identified as strengths? Give examples to explain.

4. How do the concepts you learned in this unit relate to other math concepts and to the use of mathematics in the real world?

1. Susan drove 545.5 miles on 32 gallons of gas. At this rate, how many miles per gallon (to the **nearest hundredth**) does her car get?

   F. 17 mi/gal   **H.** 18.00 mi/gal

   G. 17.05 mi/gal   **I.** 17,456.00 mi/gal

   1. Ⓕ Ⓖ Ⓗ Ⓘ
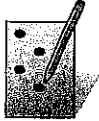
2. *SUPERCALIFRAGILISTICEXPIALIDOCIOUS* is one of the longest words in English. This word is a nonsense word used to describe something that is fantastic. What is the ratio of vowels to constants written as a fraction reduced to its **lowest terms?**

   2.

3. Kellen purchased three bags of different kinds of nuts.

   • a 12-ounce bag of pecans for $4.08

   • a 16-ounce bag of walnuts for $4.32

   • a 14-ounce bag of macadamia nuts for $4.20

   Part A: Find the unit price for each kind of nut. Then put the nuts in order by price per ounce from **lowest to highest**.

   Solve and Explain

   _____

   _____

   _____

   Part B: Write an expression you can use to determine the cost in dollars of *p* bags of pecans, *w* bags of walnuts, and *m* bags of macadamia nuts. Let *c* stand for the total cost. What is the cost of 1 bag of pecans, 3 bags of walnuts, and 2 bags of macadamia nuts?

   Solve and Explain

   _____

   _____

   _____

Read   **4.** A sport watch is on sale at the Time To Tell Store. The

Solve   original price was $450. The watch has been marked down

Explain   three times as shown on the tag.

$450

Sale: 10% off
Now 20% off the sale price.
Final sale: 50% off last price!

Part A: Find the final sale price of the watch. What percent of the original price is that?

Solve and Explain

_____

_____

_____

_____

_____

Part B: Suppose the sale percents had been reversed so that the price tag looked like this one. What would the final sale price be? What percent of the original price is that?

$450

Sale: 50% off
Now 20% off the sale price.
Final sale: 10% off last price!

Solve and Explain

_____

_____

Part C: Compare the answers to Parts A and B. Explain any patterns you notice and any patterns that may apply.

Solve and Explain

_____

_____

_____

_____

_____

_____

_____