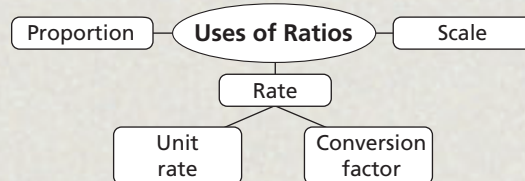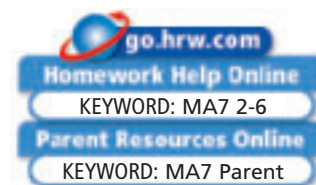## THINK AND DISCUSS

1. Explain two ways to solve the proportion $\frac{t}{4} = \frac{3}{5}$.

2. How could you show that the answer to Example 5A is reasonable?

3. **GET ORGANIZED** Copy and complete the graphic organizer. In each box, write an example of each use of ratios.

Proportion — **Uses of Ratios** — Scale

Rate

Unit rate — Conversion factor

GUIDED PRACTICE

1. Vocabulary What does it mean when two ratios form a *proportion*?

SEE EXAMPLE 1
p. 114

2. The ratio of the sale price of a jacket to the original price is $3:4$. The original price is $64. What is the sale price?

3. Chemistry The ratio of hydrogen atoms to oxygen atoms in water is $2:1$. If an amount of water contains 341 trillion atoms of oxygen, how many hydrogen atoms are there?

SEE EXAMPLE 2
p. 114

Find each unit rate.

4. A computer's fan rotates 2000 times in 40 seconds.

5. Twelve cows produce 224,988 pounds of milk.

6. A yellow jacket can fly 4.5 meters in 9 seconds.

SEE EXAMPLE 3
p. 115

7. Lydia wrote $4\frac{1}{2}$ pages of her science report in one hour. What was her writing rate in pages per minute?

8. A model airplane flies 18 feet in 2 seconds. What is the airplane's speed in miles per hour? Round your answer to the nearest hundredth.

9. A vehicle uses 1 tablespoon of gasoline to drive 125 yards. How many miles can the vehicle travel per gallon? Round your answer to the nearest mile. (*Hint:* There are 256 tablespoons in a gallon.)

SEE EXAMPLE 4
p. 116

Solve each proportion.

10. $\frac{3}{z} = \frac{1}{8}$

11. $\frac{x}{3} = \frac{1}{5}$

12. $\frac{b}{4} = \frac{3}{2}$

13. $\frac{f+3}{12} = \frac{7}{2}$

14. $\frac{-1}{5} = \frac{3}{2d}$

15. $\frac{3}{14} = \frac{s-2}{21}$

16. $\frac{-4}{9} = \frac{7}{x}$

17. $\frac{3}{s-2} = \frac{1}{7}$

18. $\frac{10}{h} = \frac{52}{13}$

19. Archaeology Stonehenge II in Hunt, Texas, is a scale model of the ancient construction in Wiltshire, England. The scale of the model to the original is $3:5$. The Altar Stone of the original construction is 4.9 meters tall. Write and solve a proportion to find the height of the model of the Altar Stone.

Alfred Sheppard, one of the builders of Stonehenge II.

PRACTICE AND PROBLEM SOLVING

20. Gardening The ratio of the height of a bonsai ficus tree to the height of a full-size ficus tree is $1:9$. The bonsai ficus is 6 inches tall. What is the height of a full-size ficus?

21. Manufacturing At one factory, the ratio of defective light bulbs produced to total light bulbs produced is about $3:500$. How many light bulbs are expected to be defective when 12,000 are produced?

Find each unit rate.

22. Four gallons of gasoline weigh 25 pounds.

23. Fifteen ounces of gold cost $6058.50.

24. Biology The tropical giant bamboo can grow 11.9 feet in 3 days. What is this rate of growth in inches per hour? Round your answer to the nearest hundredth, and show that your answer is reasonable.

25. Transportation The maximum speed of the Tupolev Tu-144 airliner is 694 m/s. What is this speed in kilometers per hour?

Solve each proportion.

26. $\dfrac{v}{6} = \dfrac{1}{2}$ **27.** $\dfrac{2}{5} = \dfrac{4}{y}$ **28.** $\dfrac{2}{h} = \dfrac{-5}{6}$ **29.** $\dfrac{3}{10} = \dfrac{b+7}{20}$

30. $\dfrac{5t}{9} = \dfrac{1}{2}$ **31.** $\dfrac{2}{3} = \dfrac{6}{q-4}$ **32.** $\dfrac{x}{8} = \dfrac{7.5}{20}$ **33.** $\dfrac{3}{k} = \dfrac{45}{18}$

34. $\dfrac{6}{a} = \dfrac{15}{17}$ **35.** $\dfrac{9}{2} = \dfrac{5}{x+1}$ **36.** $\dfrac{3}{5} = \dfrac{x}{100}$ **37.** $\dfrac{38}{19} = \dfrac{n-5}{20}$

38. Science The image shows a dust mite as seen under a microscope. The scale of the drawing to the dust mite is 100:1. Use a ruler to measure the length of the dust mite in the image in millimeters. What is the actual length of the dust mite?

39. Finance On a certain day, the exchange rate was 60 U.S. dollars for 50 euro. How many U.S. dollars were 70 euro worth that day? Show that your answer is reasonable.

40. Environmental Science An environmental scientist wants to estimate the number of carp in a pond. He captures 100 carp, tags all of them, and releases them. A week later, he captures 85 carp and records how many have tags. His results are shown in the table. Write and solve a proportion to estimate the number of carp in the pond.

Status	Number Captured
Tagged	20
Not tagged	65