Ratios and rates
Block 1 Student Activity Sheet

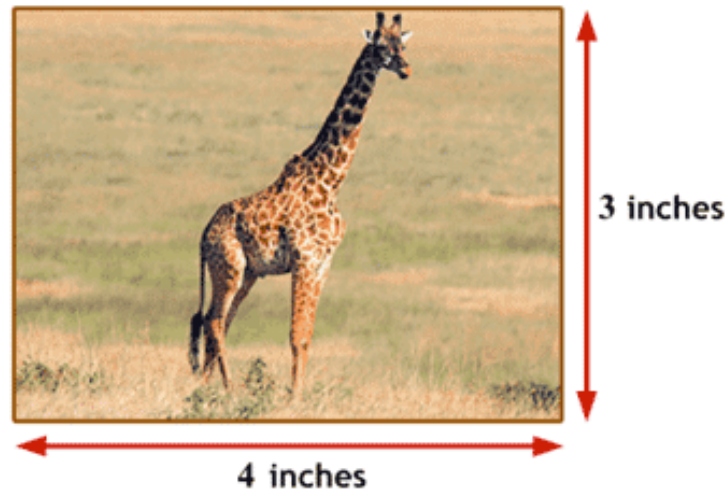1. Find the scale factor between the two images.

32 inches

8 inches

40 inches

10 inches
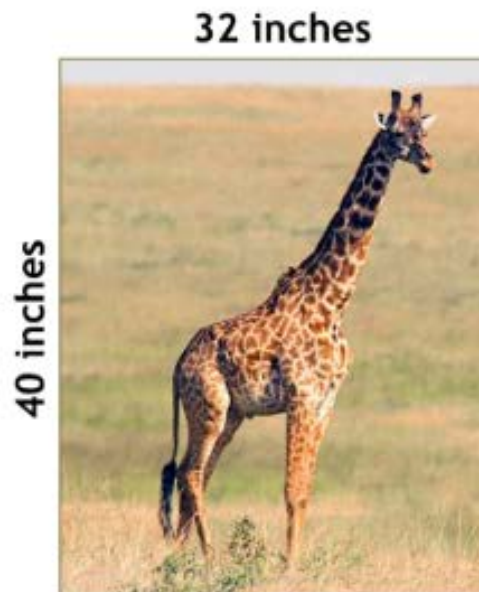
2. Define unit rate.

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3. Express the relationship between the height and width of this picture as a unit rate.

4. A recipe for oatmeal calls for $1\frac{1}{2}$ cups of oats and $2\frac{1}{2}$ cups of water. Find two unit rates associated with this ratio.

5. What are some examples of unit rates?

Ratios and rates

6. **REINFORCE** Bradley's family is testing light bulbs. They want to determine which type consumes energy at the lowest rate.

   a. Bradley used a light bulb that consumed 8800 joules of energy in 220 seconds. What is the unit rate at which this light bulb used energy?

   b. His sister, Janine, used a light bulb that consumed 6080 joules of energy in 190 seconds. What is the unit rate at which this light bulb used energy?

   c. Bradley's dad used a light bulb that consumed 5000 joules in 50 seconds. What is the unit rate at which this light bulb used energy?

   d. Who tested the light bulb that uses energy at the lowest rate?

7. **REINFORCE** Harry pays $188 per month for parking. During an average month, he parks in the garage 20 days. What is the average rate he pays per day to park in the garage?

8. **REINFORCE** Maria wants to rent a kayak. She has two options to choose from. Surf Bargains charges $31.54 for 2 hours. Kayak Central charges $43.96 for 3.5 hours. Which shop offers the lower hourly rate?

Ratios and rates

9. **REINFORCE** Look in the newspaper or online for additional examples of rates and unit rates. Find and record at least three rates that are unit rates. Also record at least three rates that are not unit rates, such as 3 avocados for $4.

10. **REINFORCE** Write your own problem about a unit rate you found in the previous problem. For example, if 3 avocados cost $4, how much would 12 avocados cost? Show at least one way to solve your problem.

Ratios and rates
Block 2 Student Activity Sheet

1. It took Anthony's family 5 hours and 10 minutes to drive the 296 miles between Chicago and St. Louis. What was their average speed, in miles per hour?

2. Anthony's family left Chicago with a full gas tank. When they got to St. Louis, they filled the car back up. It took 8 gallons of gas to fill the tank. Gas cost $3.26 per gallon.

   a. What was the gas mileage for the 296-mile trip? In other words, how many miles per gallon did the car get?

   b. What was the total cost for the gas?

3. You took a trip to the San Diego Zoo. You traveled 693 miles. The trip took you 11 hours and you used 21 gallons of gas. The total cost of the gas was $69.72. Can you use this information to complete the following unit rates for the trip?

   Your average speed on the trip was _____ miles per hour.

   The mileage your car got on the trip was _____ miles per gallon.

   The unit price you paid for gas was _____ per gallon.

4. If you travel 105 miles at 70 mph, how long will the trip take?

5. A hybrid car can get 54 mpg when traveling at an average speed of 30 mph. You travel in this car at that speed for 45 miles to your grandparents' house. Gas at your nearest station costs $3.23. Use this information to complete the statements.

    It will take _____ hours to get to your grandparents' house.

    Your car will use _____ gallons of gas on the trip.

    You will spend _____ on gas for the trip.

6. REINFORCE Find a unit rate for each situation.

    a. You traveled 600 miles in 11 hours. How many miles per hour did you travel?

    b. You used 13 gallons when you traveled 342 miles. How many miles did you travel per gallon?

    c. You filled your car tank with gas at the beginning of the trip. At the start of the trip, your odometer read 25,678 miles. At the end of your trip, your odometer read 26,109 miles. When you filled your tank at the end of the trip, it took 15 gallons of gas. How many miles per gallon did the car get?

d. The total cost for 22 gallons of gas is $68.30. How many dollars per gallon of gas did you spend?

7. **REINFORCE** On a trip to the Museum of Mathematics in New York City, you traveled 754 miles. The trip took you 13 hours and you used 26 gallons of gas. The total cost of the gas was $78.78. Complete the following rates for the trip.

a. Your average speed on the trip was _____ miles per hour.

b. The mileage your car got on the trip was _____ miles per gallon.

c. The price you paid for gas was _____ per gallon.

Ratios and rates
Block 4 Student Activity Sheet

1. An oatmeal recipe calls for $1\frac{1}{2}$ cups of oats and $2\frac{1}{2}$ cups of water. For each question, use a unit rate to answer the question by filling in the blanks.

    a. If you have 3 cups of oats, how many cups of water do you need?

    3 cups oats • _____ = _____ cups of water.

    b. If you have 2 cups of oats, how many cups of water do you need?

    2 cups oats • _____ = _____ cups of water.

    c. If you have 5 cups of water, how many cups of oats do you need?

    5 cups water • _____ = _____ cups of oats.

    d. If you have 3 cups of water, how many cups of oats do you need?

    3 cups water • _____ = _____ cups of oats.

Ratios and rates
Block 4 Student Activity Sheet

2. Briana is making a lemon-ginger punch for a picnic. Her recipe calls for $\frac{3}{4}$ cup of lemonade and $\frac{1}{3}$ cup of ginger ale. She wants to make 26 cups of the lemon-ginger punch. She wants to keep the ratio of the ingredients the same as in the original recipe. How many cups of lemonade and how many cups of ginger ale will she need?

3. Find the two unit rates associated with the ratio of lemonade to ginger ale in Briana's punch recipe.

4. If Briana has 8 cups of lemonade, how many cups of ginger ale does she need to make the punch?

5. If Briana has 8 cups of ginger ale, how many cups of lemonade does she need to make t punch?

6. Kevin can walk $\frac{2}{3}$ of a mile in $\frac{2}{5}$ of an hour. He lives 1 mile from his school. Use this information to complete the statements.

$\frac{4}{15}$	$\frac{1}{2}$	$\frac{3}{5}$	$1\frac{1}{5}$	$1\frac{2}{3}$	$3\frac{1}{5}$

At this rate, Kevin can walk [ ] miles in 1 hour.

At this rate, it will take Kevin [ ] hours to walk to school.

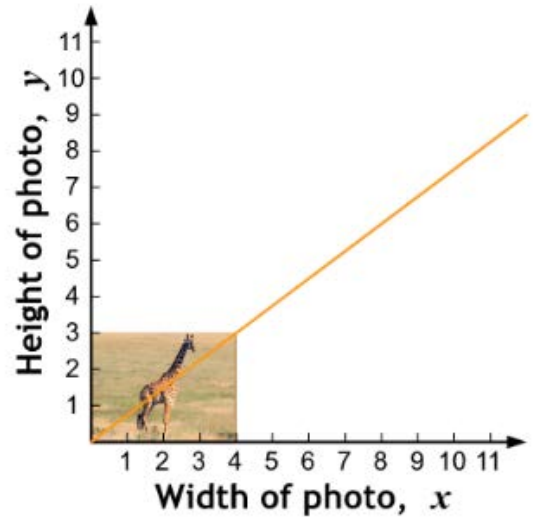**Ratios and rates**
Block 6 Student Activity Sheet

1. You used your camera to take a close up picture of a giraffe at the zoo. The height of the picture is 3 inches. The width of the picture is 4 inches.

   a. Consider the coordinate graph. How can you use the graph and coordinate pairs to find the dimensions of a picture that is proportional to the original?

   b. List the dimensions of at least three pictures that are proportional to the original picture. Find at least one picture that has a dimension that is not a whole number.

   c. What is a constant of proportionality and how is it represented in a graph?
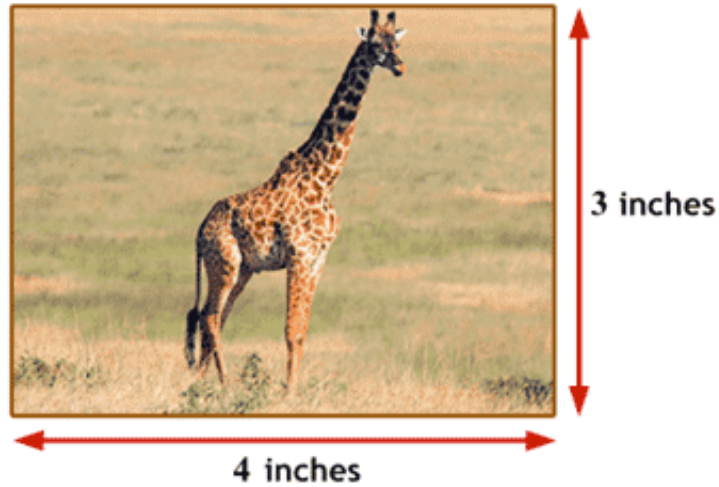
2. In the giraffe photo situation, the height (*h*) equals the constant of proportionality, $\frac{3}{4}$, times the width (*w*):

$$h = \frac{3}{4} \cdot w$$

   The camera shop makes pictures into posters with a width of 12 inches. What will be the height of the poster?

Ratios and rates
Block 6 Student Activity Sheet

3 inches

4 inches

3. The photograph is 4 inches wide and represents 16 feet in actual distance. In the photograph, the height of the giraffe is 3 inches. Write an equation you could use to find the actual height of the giraffe.

144	16	18	$\frac{3}{4}$	inches
12	$\frac{4}{3}$	192	•	feet

$h = $ ☐ ☐ ☐ ☐

4. What other unit rate is associated with the ratio of height to width in the giraffe photograph?

5. Suppose you want to enlarge the 4-inch by 3-inch photograph of the giraffe. You want to make a poster with a height of 48 inches. Write an equation you could use to answer this question. Then solve the equation to find the actual width of the poster.

| $\dfrac{3}{4}$	$\dfrac{4}{3}$	36	64	48	$\dfrac{16}{3}$

$$w = \boxed{} \cdot \boxed{}$$

$$w = \boxed{} \text{ inches}$$

6. **REINFORCE** In a photo, the unit rate is $\dfrac{3}{4}$ inch of height for every inch of width. The actual height of the image is 15 feet. What is the actual width of the image?

Ratios and rates
Block 6 Student Activity Sheet

7. **REINFORCE** In a different photograph of a 12-foot-tall giraffe, the width of the actual scene is 15 feet. The height of the giraffe in the picture measures 4 inches. How wide is the photograph?
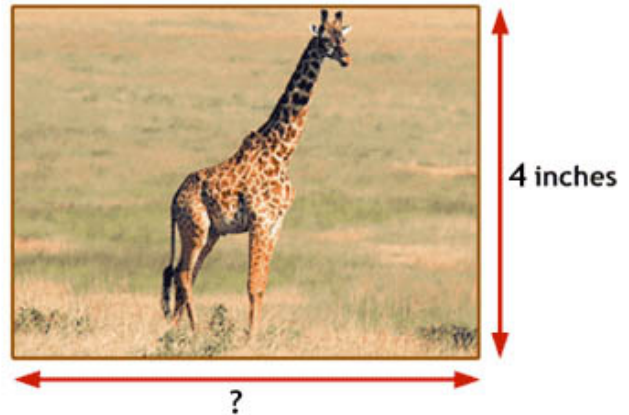
8. **REINFORCE** Maggie makes a scale model of her house. After creating the model, she forgets what the height of her house is. She remembers the house is 60 feet wide. Her model is 12 inches wide and 9 inches high. What is the actual height of the house?

9. **REINFORCE** Rob has a scale model of his mother's car. His mother's car is 4.5 meters long and 1.5 meters wide. If the width of Rob's model is 3 inches, what is its length?
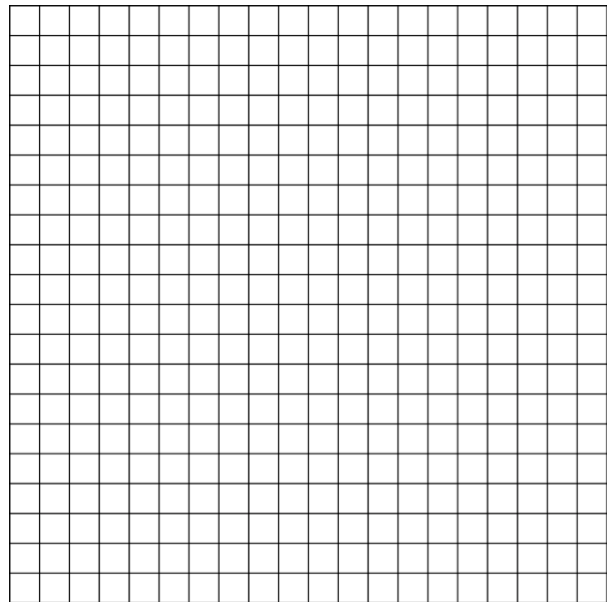
Ratios and rates
Block 7 Student Activity Sheet

1. Mallory works at a local coffee shop. Last week she worked 22 hours and 30 minutes and earned $258.75. What does Mallory earn per hour?

2. Write an equation that relates the hours Mallory works, **x**, and the amount she earns, **y**. If Mallory work 20 hours and 45 minutes this week, how much will she earn?

3. You found a unit rate that compares dollars earned per hours worked at the coffee shop. Is there another unit rate you could write for this relationship? What does that unit rate mean in the context of the situation? What is the related constant of proportionality?

Ratios and rates
Block 7 Student Activity Sheet

4. How many hours would Mallory have to work in a day to make $46? Use an equation to answer this question.

5. **REINFORCE** For each scenario, find a unit rate and write an equation that relates the two quantities. Make a table of 4 values and sketch a graph of the relationship. Identify the constant of proportionality.
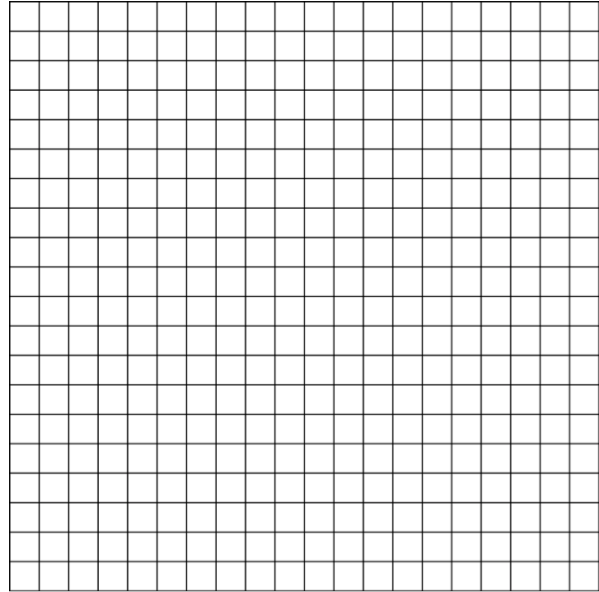
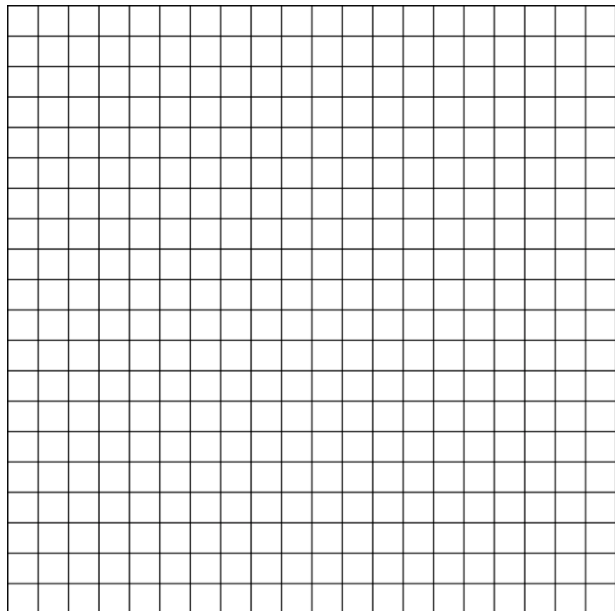   a. Sasha works at a clothing store. She earned $66 for working an 8-hour shift.

b. Eric mows lawns in the summer to earn some extra money. One weekend, he mowed 5 lawns of the same size and earned $150.

c. Ashton works at a drop-in day care center. He earned $68.25 for working 6 hours and 30 minutes.