



CCSS: 7.RP.A.1: Compute unit rates associated with ratios of fractions, including ratios of lengths, areas and other quantities measured in like or different units.

## Launch

SAMPLE SOLUTIONS ARE SHOWN BELOW.

MP4, MP7

Three teams train turtles for the Third Annual Turtle Trot, a 30-foot race. If the turtles trot at their training pace, which turtle will win the race? By how many minutes? Explain your reasoning.

**Team 1 Turtle**  
18 feet in 6 minutes



**Team 2 Turtle**  
12 feet in 4 minutes



**Team 3 Turtle**  
10 feet in 2 minutes



To solve the problem, you can first compute the unit rate for each turtle.

Turtle 1:  $\frac{18 \text{ feet}}{6 \text{ minutes}} = \frac{3 \text{ feet}}{1 \text{ minute}}$ . If Turtle 1 keeps this pace, it will complete the race in 10 minutes because  $\frac{3 \text{ feet}}{1 \text{ minute}} = \frac{30 \text{ feet}}{10 \text{ minutes}}$ .

Turtle 2:  $\frac{12 \text{ feet}}{4 \text{ minutes}} = \frac{3 \text{ feet}}{1 \text{ minute}}$ . If Turtle 2 keeps this pace, it will complete the race in 10 minutes because  $\frac{3 \text{ feet}}{1 \text{ minute}} = \frac{30 \text{ feet}}{10 \text{ minutes}}$ .

Turtle 3:  $\frac{10 \text{ feet}}{2 \text{ minutes}} = \frac{5 \text{ feet}}{1 \text{ minute}}$ . If Turtle 3 keeps this pace, it will complete the race in 6 minutes because  $\frac{5 \text{ feet}}{1 \text{ minute}} = \frac{30 \text{ feet}}{6 \text{ minutes}}$ .

Turtle 3 will win the race by 4 minutes because  $10 - 6 = 4$ .

**Reflect** Could you have solved the problem without unit rates? Explain.

Sample: For Turtle 3, multiply both the feet and minutes by 3 to find the time that matches 30 feet. For the others, guess and check to get a time that matches 30 feet.

# Got It?

## PART 1 Got It



Find the unit rate for 219 heartbeats in 3 minutes.

73 heartbeats per minute

## PART 2 Got It



You also need to buy dye for the tie-dying activity. You can buy the dye in various sizes. Which is the best buy?

- 2 fl oz for \$3.96
- 4 fl oz for \$8.36
- 8 fl oz for \$14.24
- 16 fl oz for \$28.96

8 fl oz

## PART 3 Got It



A satellite travels about 2,272 mi in 8 min. About how many miles does the satellite travel in 3 min?

852 mi

Discuss with a classmate

Compare your answers to this problem.

Discuss what it means for an answer to be reasonable.

How can you apply what you know about checking an answer for reasonableness to the answers to this problem?

# Close and Check



## Focus Question

© MP1, MP7

How can you identify a rate? How can unit rates help you to solve problems?

Sample: A ratio is a rate if it compares two quantities measured  
in different units. Because unit rates give you a rate per one  
item, they are easier to compare and make sense of. You can use  
unit rates to quickly find equivalent rates.



## Do you know HOW?

1. The Earth rotates 1.25 degrees in 5 minutes. How many degrees does it rotate in 1 minute?  
**0.25** degrees
2. A driver fills his tank with 15 gallons of gas for \$45.60 at a gas station. The next time he stops he fills up with 12 gallons for \$39.00. Find the unit price for gas at each station and circle which has the better deal.  
1st Station: **\$3.04**  
2nd Station: **\$3.25**
3. There are approximately 457 babies born each hour in the United States. Find the approximate number of babies born in the United States every 20 minutes.

**152** babies



## Do you UNDERSTAND?

SAMPLE SOLUTIONS ARE SHOWN BELOW.

4. **Writing** A company earns a profit of \$50 for every 10 items sold. Explain how the company can find the amount of profit for 50 items sold.

The company can divide 50 by  
10 to find the unit rate for  
profit ( $\frac{\$5}{1}$ ). To find the rate  
for 50 items, multiply the unit  
rate by  $\frac{50}{10}$ . It's a \$250 profit.

5. **Error Analysis** A classmate writes a rate for Exercise 1 to express the degrees rotated in 2 minutes. Explain her error and give the correct rate.

$$\frac{1.25 \div 2}{5 \div 2} = \frac{0.625}{2.5}$$

Her rate is for 2.5 minutes.  
She should divide both the  
numerator and denominator  
by 5 to find the unit rate and  
then multiply the unit rate  
by  $\frac{2}{5}$ . The correct rate is  $\frac{0.5}{2}$ .