# 5.1

# Activity Day

# Rates

## What does this mean?

$$\frac{120\,mi}{2\,h}$$

# Rates

## What does this mean?

$$\frac{6\,cups\,of\,sugar}{3\,donuts}$$

# Review

**Evaluate.**

1) $\frac{32}{4}$

2) $\frac{15}{\frac{1}{2}}$

# Review

**Evaluate.**

3) $\dfrac{\frac{6}{20}}{\frac{3}{15}}$

4) $\dfrac{\frac{7}{8}}{\frac{21}{64}}$

Name_____ Date _____

# 5.1 Ratios and Rates

**For use with Activity 5.1**

**Essential Question** How do rates help you describe real-life problems?

## 1 ACTIVITY: Finding Reasonable Rates

**Work with a partner.**

**a.** Match each description with a verbal rate.

**b.** Match each verbal rate with a numerical rate.

**c.** Give a reasonable numerical rate for each description. Then give an unreasonable rate.

| *Description* | *Verbal Rate* | *Numerical Rate* |
|---|---|---|
| Your running rate in a 100-meter dash | Dollars per year | $= \frac{\square \text{ in.}}{\text{yr}}$ |
| The fertilization rate for an apple orchard | Inches per year | $= \frac{\square \text{ lb}}{\text{acre}}$ |
| The average pay rate for a professional athlete | Meters per second | $= \frac{\$ \square}{\text{yr}}$ |
| The average rainfall rate in a rainforest | Pounds per acre | $= \frac{\square \text{ m}}{\text{sec}}$ |

## 2 ACTIVITY: Simplifying Expressions That Contain Fractions

**Work with a partner. Describe a situation where the given expression may apply. Show how you can rewrite each expression as a division problem. Then simplify and interpret your result.**

**a.** $\dfrac{\frac{1}{2}\text{ c}}{4\text{ fl oz}}$

**b.** $\dfrac{2 \text{ in.}}{\frac{3}{4} \text{ sec}}$

**c.** $\dfrac{\frac{3}{8} \text{ c sugar}}{\frac{3}{5} \text{ c flour}}$

**d.** $\dfrac{\frac{5}{6} \text{ gal}}{\frac{2}{3} \text{ sec}}$

## 3 ACTIVITY: Using Ratio Tables to Find Equivalent Rates

**Work with a partner. A communications satellite in orbit travels about 18 miles every 4 seconds.**

**a.** Identify the rate in this problem.

**b.** Recall that you can use *ratio tables* to find and organize equivalent ratios and rates. Complete the ratio table below.

| **Time (seconds)** | 4 | 8 | 12 | 16 | 20 |
|---|---|---|---|---|---|
| **Distance (miles)** | | | | | |

**c.** How can you use a ratio table to find the speed of the satellite in miles per minute? miles per hour?

**d.** How far does the satellite travel in 1 second? Solve this problem (1) by using a ratio table and (2) by evaluating a quotient.

**e.** How far does the satellite travel in $\frac{1}{2}$ second? Explain your steps.

## 4 ACTIVITY: Unit Analysis

**Work with a partner. Describe a situation where the product may apply. Then find each product and list the units.**

**a.** $10 \text{ gal} \times \frac{22 \text{ mi}}{\text{gal}}$

**b.** $\frac{7}{2} \text{ lb} \times \frac{\$3}{\frac{1}{2}\text{lb}}$

**c.** $\frac{1}{2} \text{ sec} \times \frac{30 \text{ ft}^2}{\text{sec}}$