

## Indicator 6 Class Notes by Mrs. Joshi

### Rates

2. Use unit rates to represent and describe ratio relationships.

#### Key Idea

##### Rate and Unit Rate

**Words** A **rate** is a ratio of two quantities using different units.

**Numbers** You pay \$27 for 3 pizzas.

$$\text{rate} = \frac{\$27}{3 \text{ pizzas}}$$

← dollars  
← pizzas

**Words** A **unit rate** compares a quantity to one unit of the other quantity.

**Numbers**

Rate:  $\frac{\$27}{3 \text{ pizzas}}$  } Unit rate:  $\frac{\$9}{1 \text{ pizza}}$



#### EXAMPLE 1 Writing a Rate

In a jalapeño pepper-eating contest, a contestant eats 70 peppers in 3 minutes. Write a rate that represents this situation.

$$\text{rate} = \frac{70 \text{ peppers}}{3 \text{ minutes}}$$

← peppers  
← minutes

❖ A rate is  $\frac{70 \text{ peppers}}{3 \text{ minutes}}$ .

#### EXAMPLE 2 Writing a Unit Rate

In orbit, a space shuttle travels 70,000 miles in 4 hours. How far does it travel in 1 hour?

$$\frac{70,000 \text{ miles}}{4 \text{ hours}} = \frac{17,500 \text{ miles}}{1 \text{ hour}}$$

÷ 4      ÷ 4

To get a denominator of 1, divide each number by 4.

❖ The space shuttle travels 17,500 miles in 1 hour.

##### Reading

Dollars per hour and miles per gallon are commonly used unit rates.



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### EXAMPLE 3 Using a Unit Rate



You earned 150 points for every note you successfully hit in a music video game. How many points did you earn?

$$\begin{array}{ccc} & \times 25 & \\ \text{unit rate} \rightarrow & \frac{150 \text{ points}}{1 \text{ note}} & = & \frac{3750 \text{ points}}{25 \text{ notes}} \\ & \times 25 & \end{array}$$

• You earned 3750 points.

### EXAMPLE 4 Comparing Unit Costs

Which bag of dog food is the better buy? Explain.



20-pound bag

$$\begin{array}{ccc} & \div 20 & \\ \frac{\$17.20}{20 \text{ pounds}} & = & \frac{\$0.86}{1 \text{ pound}} \\ & \div 20 & \end{array}$$

40-pound bag

$$\begin{array}{ccc} & \div 40 & \\ \frac{\$33.60}{40 \text{ pounds}} & = & \frac{\$0.84}{1 \text{ pound}} \\ & \div 40 & \end{array}$$

• Because \$0.84 is less than \$0.86, the 40-pound bag is the better buy.