

Chapter 16

UNIT RATE AND UNIT PRICE

A **RATE** is a special kind of ratio where the two amounts being compared have different units. For example, you might use rate to compare 3 cups of flour to 2 teaspoons of sugar. The units (cups and teaspoons) are different.

A **UNIT RATE** is a rate that has 1 as its denominator. To find a unit rate, set up a ratio as a fraction and then divide the numerator by the denominator.

EXAMPLE: A car can travel 300 miles on 15 gallons of gasoline. What is the unit rate per gallon of gasoline?

$$300 \text{ miles} : 15 \text{ gallons} = \frac{300 \text{ miles}}{15 \text{ gallons}} = 20 \text{ miles per gallon}$$

The unit rate is 20 miles per gallon.

This means the car can travel 20 miles on 1 gallon of gasoline.

EXAMPLE: An athlete can swim $\frac{1}{2}$ mile every $\frac{1}{3}$ hour.
What is the unit rate of the athlete?

In plain English: How many miles per hour can the athlete swim?

$$\frac{1}{2} \text{ mile} : \frac{1}{3} \text{ mile} = \frac{\frac{1}{2}}{\frac{1}{3}} = \frac{1}{2} \times \frac{3}{1} = \frac{3}{2}$$

= $1\frac{1}{2}$ miles per hour

When the unit rate describes a price, it is called **UNIT PRICE**. When you're calculating unit price, be sure to put the price in the numerator!

EXAMPLE: Jacob pays \$1.60 for 2 bottles of water.
What is the unit price of each bottle?

$$\$1.60 : 2 \text{ bottles or } \frac{1.60}{2} = \$0.80$$

The unit price is \$0.80 per bottle.



CHECK YOUR KNOWLEDGE

For 1 through 10, find the unit rate or unit price.

1. My mom jogs 30 miles in 5 hours.
2. We swam 100 yards in 2 minutes.
3. Juliette bought 8 ribbons for \$1.52.
4. He pumped 54 gallons in 12 minutes.
5. It costs \$2,104.50 to purchase 122 soccer balls.
6. A runner sprints $\frac{1}{2}$ of a mile in $\frac{1}{15}$ hour.
7. Linda washes 26 bowls per 4 minutes.
8. Safira spends \$42 for 12 gallons of gas.
9. Nathaniel does 240 push-ups in 5 minutes.
10. A team digs 12 holes every 20 hours.

ANSWERS

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CHECK YOUR ANSWERS



1. 6 miles per hour
2. 50 yards per minute
3. \$0.19 per ribbon
4. 4.5 gallons per minute
5. \$17.25 per soccer ball
6. $7\frac{1}{2}$ miles per hour
7. 6.5 bowls per minute
8. \$3.50 per gallon of gas
9. 48 pushups per minute
10. 0.6 holes per hour