Unit Rates

Vocabulary

- A **rate** is a ratio that compares two quantities measured in different units.
- The **unit rate** is the rate for one unit of a given quantity. Unit rates have a denominator of 1.

Joey's heart beat 150 beats in minutes.

What is his beats per minute?

Rate: $\frac{150 \text{ heartbeats}}{2 \text{ minutes}}$

Unit Rate (Divide/simplify)

150 ÷ 2 = 75 heartbeats per minute.

Find the Unit Rate

Amy can read 88 pages in 4 hours. What is the unit rate? (How many pages can she read per hour?)

$$\frac{88 \text{ pages}}{4 \text{ hours}} \longrightarrow 22 \text{ pages / hour}$$

Using Unit Rates

- You can find the missing terms of equal ratios.
- Use the unit rate, and set it equal to another ratio.
- Solve for what is missing by dividing or multiplying.

Example

Joe's car goes 25 miles per gallon of gasoline. How far can it go on 8 gallons of gasoline?

Unit Rate

x 8

$$\frac{25 \text{ miles}}{1 \text{ gallon}} = \frac{\quad}{8 \text{ gallons}}$$

x 8

25 x 8 = 200. Joe's car can go 200 miles on 8 gallons of gas.

Comparing Unit Prices

- Use division to find the unit prices of the two products in question.
- The unit rate that is smaller (costs less) is the better value.

Example

Juice is sold in two different sizes. A 48-fluid ounce bottle costs $2.07. A 32-fluid ounce bottle costs $1.64. Which is the better buy?

$$\frac{\$2.07}{48 \text{ fl.oz.}} \rightarrow 0.043125 \rightarrow \$0.04 \text{ per fl.oz.}$$

$$\frac{\$1.64}{32 \text{ fl.oz.}} \rightarrow 0.05125 \rightarrow \$0.05 \text{ per fl.oz.}$$

The 48 fl.oz. bottle is the better value.

Homework Time