

Name: 3<sup>rd</sup> hour

### Rates and Unit Rates

#### DEFINITION

A rate is a comparison of two quantities measured in different units. They are usually written as fractions and MUST be in simplest form. Since it involves two different units, you MUST include units as part of the fraction.

160 beats

Example: 3 min Can you think of other examples?

60 miles per hour  
200 miles  
10 gal

#### DEFINITION

A unit rate is the rate for one unit of a given quantity; a rate in which the denominator (bottom) is equal to one. They can be expressed as fractions or using the word per. If the rate involves money, such as \$20 per DVD, then it is called the unit price or unit cost.

Examples: \$5.00 per CD  
\$10 per basketball

7 min per lap  
12 mi per gal

#### Finding a Unit Rate

Example: While fleeing from Belleville during the zombie apocalypse, Adrienne biked 24 miles in 4 hours. If she biked at a constant speed, how many miles did she ride in one hour?

Step 1: Write the rate as a fraction.

$$\frac{24 \text{ miles}}{4 \text{ hours}} \div 4$$

Step 2: Divide the top and bottom by the denominator (bottom)

so you get 1 as the new denominator. Remember that dividing the top and bottom by the same number will have no effect on the value of the fraction!

$$\frac{6 \text{ miles}}{1 \text{ hour}} \text{ or } 6 \text{ mph}$$

Step 3: Don't forget to include units!

#### You Try:

1. Carli, freshly turned to a zombie, walked 16 miles in 5 hours. Find the unit rate.

$$\frac{16 \text{ mi}}{5 \text{ hrs}} \div 5 = 3.2 \text{ miles per hour}$$

2. 220 miles on 8 gallons

$$\frac{220 \text{ mi}}{8 \text{ gal}} \div 8 = 27.5 \text{ mpg}$$