

Lesson 1.1 Notes (Rates)

Introduction: How many times does your heart beat in 1 minute?

Key Vocabulary:

- **Rate** - A ratio that compares two quantities with different kinds of units
 - When you found your pulse, you were actually finding your *heart rate* (the number of beats per minute)
- **Unit Rate** - A rate that is simplified so that it has a denominator of **one**

<u>Common Unit Rates</u>			
Rate	Unit Rate	Abbreviation	Name
$\frac{\# \text{ of miles}}{\# \text{ of hours}}$	Miles per hour	$\frac{mi}{h}$ (or mph)	Average speed
$\frac{\# \text{ of miles}}{\# \text{ of gallons}}$	Miles per gallon	$\frac{mi}{gal}$ (or mpg)	Gas mileage
$\frac{\# \text{ of dollars}}{\# \text{ of pounds}}$	Price per pound	$\frac{dollars}{lb}$	Unit price

Examples:

1. Jennifer biked 24 miles in 4 hours. If she biked at a constant speed, how many miles did she ride in one hour?

$$\frac{24 \text{ miles}}{4 \text{ h}} = \frac{6 \text{ miles}}{1 \text{ h}} \Rightarrow \boxed{6 \text{ miles}}$$

2. Find each unit rate.

- a. \$300 for 6 hours of work

$$\frac{\$300}{6 \text{ h}} = \boxed{\frac{\$50}{1 \text{ h}}}$$

- b. 160 miles on 8 gallons

$$\frac{160 \text{ mi}}{8 \text{ gal}} = \boxed{20 \text{ mi/gal}}$$

3. Find the unit price if it costs \$2 for eight juice boxes.

$$\frac{\$2}{8 \text{ boxes}} = \frac{\$0.25}{1 \text{ box}} \Rightarrow \boxed{\$0.25 \text{ per box}}$$

4. The prices of 3 different bags of dog food are given in the table. Which size bag has the lowest price per pound?

Bag Size (lb)	Price (\$)
40	49.00
20	23.44
8	9.88

$$40 \text{ lb} : \frac{\$49.00}{40 \text{ lb}} = \$1.23/\text{lb}$$

$$20 \text{ lb} : \frac{\$23.44}{20 \text{ lb}} = \$1.17/\text{lb} \Rightarrow \boxed{20 \text{ lb Bag}}$$

$$8 \text{ lb} : \frac{\$9.88}{8 \text{ lb}} = \$1.24/\text{lb}$$