

Lesson 5-2 Notes

Unit Rates and Proportional Reasoning

What is a rate?

Rate: A ratio that compares quantities in different units.

Ex) I can type 112 words in a minute. $\frac{112 \text{ words}}{1 \text{ min}}$ 112 wpm

Ex) A box of cereal that contains 8 servings has a total of 36 grams of fat.

$$\frac{8 \text{ serv.}}{36 \text{ g}} = \frac{1 \text{ serv.}}{4.5 \text{ g}}$$

Ex) Two rounds of golf at the club cost \$35.00.

$$\frac{\$35}{2 \text{ r}} = \boxed{\frac{\$17.50}{1 \text{ r}}}$$

$$\frac{36 \text{ g}}{8 \text{ serv.}} = \boxed{\frac{4.5 \text{ g}}{1 \text{ serv.}}}$$

What is a unit rate?

Unit Rate: A rate for one unit of a given quantity.

Ex) In the US **unit rate** of speed is often measured in mph or $\frac{\text{miles}}{\text{hour}}$.

Ex) A bag of chips has 12 g of fat per serving. $\frac{12 \text{ g/serv.}}{1 \text{ serv.}}$ 12g

List two more examples of common unit rates:

\$/round of golf

taxis \$/mile

\$/gallon gas

We can calculate the unit rate:

\$/lb

Ex) Jack bought 3 pounds of apples for \$7.50. What is the unit rate?

$$\frac{\cancel{3 \text{ lb}}}{\cancel{\$7.50}} = \text{scribbles}$$

$$\frac{\$7.50}{3 \text{ lb}} =$$

$$\boxed{\$2.50/\text{lb.}}$$

Just **divide** the first quantity by the second quantity!

You Try!

Mr. Coleman purchased 9 gallons of gas for \$15.84. What is the unit rate?

$$\frac{\$15.84}{9 \text{ gal}} = \boxed{\frac{\$1.76}{1 \text{ gal}}}$$

how much is 1 gal?

We often use unit rates to compare prices, performance or quality of goods.

For example, if Store X sells \$3.99/lb. and Store Y sells it for \$4.59/lb., which is the better deal?

Which is the better buy?

Walmart sells a 12 oz. bag of M&Ms for \$3.55. Target sells a 28 oz. bag of M&Ms for \$6.45. Which is a better deal?

Walmart

$$\frac{\$3.55}{12 \text{ oz}} = 0.295$$

$$\frac{\$0.30}{1 \text{ oz}}$$

Target

$$\frac{\$6.45}{28 \text{ oz}} = 0.23$$

$$\boxed{\frac{\$0.23}{1 \text{ oz}}}$$

The table below shows prices for different sizes of the same dish soap. Which is the better buy?

Size	Volume (oz)	Price
Regular	12	\$1.20
* → Family	28	\$2.24
Economy	40	\$3.60

reg.

$$\frac{\$1.20}{12 \text{ oz}} = \boxed{\frac{\$0.10}{1 \text{ oz}}}$$

family

$$\frac{\$2.24}{28 \text{ oz}} = \boxed{\frac{\$0.08}{1 \text{ oz}}}$$

Econ.

$$\frac{\$3.60}{40 \text{ oz}} = \boxed{\frac{\$0.09}{1 \text{ oz}}}$$