

## Warm Up

October 17, 2018

1.) Use your Chromebook to complete the following conversion factors:

$$1 \text{ ft} = \underline{12} \text{ in.}$$

$$1 \text{ mi.} = \underline{5280} \text{ ft.}$$

$$\underline{1} \text{ tbsp.} = 3 \text{ tsp.}$$

$$\underline{3600} \text{ sec.} = 1 \text{ hour}$$

$$1 \text{ gal.} = \underline{4} \text{ qts.}$$

$$1 \text{ m} = \underline{3.28} \text{ ft.}$$

$$1 \text{ mi.} = \underline{1760} \text{ yds.}$$

$$1 \text{ kg.} = \underline{1000} \text{ g}$$

*Conversion Factor is a ratio of two equivalent measures in different units. A conversion factors is always equal to 1.*

## Rates and Unit Rates:

$$\frac{60 \text{ miles}}{3 \text{ hours}} \quad \frac{20 \text{ miles}}{1 \text{ hour}} = 20 \text{ miles/hour}$$
$$\frac{40 \text{ words}}{2 \text{ min.}} \quad \frac{20 \text{ words}}{1 \text{ min.}} = 20$$

A **rate** is a special ratio in which the two terms are in different units.

A **unit rate** is special rate with a denominator of 1.

You are shopping for t-shirts. Which store has the better deal?

Store A: \$25 for 2 shirts

Store B: \$45 for 4 shirts

Store C: \$30 for 3 shirts

Write each price as a ratio. Then write the ratio as a **unit rate**.

$$\text{Store A: } \frac{\$25}{2 \text{ shirts}} = \frac{\$12.50}{1 \text{ shirt}}$$

$$\text{Store B: } \frac{\$45}{4 \text{ shirts}} = \frac{\$11.25}{1 \text{ shirt}}$$

$$\text{Store C: } \frac{\$30}{3 \text{ shirts}} = \frac{\$10}{1 \text{ shirt}}$$

Finding The  
Better Buy



*Store C is the better buy because it cost less per shirt.*

## Better Buy Practice!

Step By Step Problems	Try It Yourself Problems
<p>1. Bargains R Us store offers a 12 roll package of Wipey Wonder toilet paper for \$2.59. The 6 roll package is on sale for \$1.25. Which is the best buy?</p> <p><i>Basic unit rate comparison – \$ divided by amount</i></p> <p>12 roll package = \$ <math>\frac{0.22}{}</math> per roll</p> <p>6 roll package = \$ <math>\frac{0.21}{}</math> per roll</p> <p>The better buy is the <u>6</u> roll package</p>	<p>1. Wal-mart sells a case of 24 cans of Diet Coke for \$6.88. Kroger sells a 12 pack of Diet Coke for \$3.99. Which is the best buy?</p> $\frac{\$6.88}{24 \text{ cans}} = \frac{\$0.29}{1 \text{ can}}$

$$\frac{\$2.59}{12 \text{ rolls}} = \frac{\$0.22}{1 \text{ roll}}$$

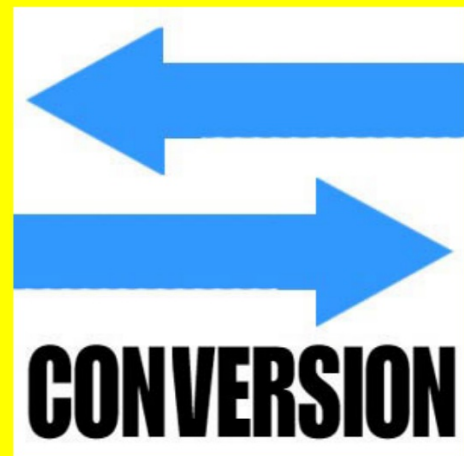
$$\frac{\$1.25}{6 \text{ rolls}} = \frac{\$0.21}{1 \text{ roll}}$$

$$\frac{\$3.99}{12 \text{ cans}} = \frac{\$0.33}{1 \text{ can}}$$

Purchasing 24 cans for \$6.88 at Wal-Mart is a better buy.

## Steps to Converting Units

1. Choose a conversion factor.
- 2.) Divide out common units.
- 3.) Simplify.



Convert 330 minutes to hours

CONVERSION  
FACTOR

$$330 \text{ min} \cdot \frac{1 \text{ hour}}{60 \text{ min}} = \underline{5.5 \text{ hours}}$$

↓  
unit rate

whatever you want to cancel  
goes in the denominator

Convert 15 kilograms to grams

*How many grams are in 1 kilogram?*

$$15 \text{ kgs} \cdot \frac{1000 \text{ g}}{1 \text{ kg}} = 15,000 \text{ g}$$

$$\frac{1000 \text{ grams}}{1 \text{ kg}}$$

$$\frac{1 \text{ kg}}{1000 \text{ grams}}$$

*Which unit rate is correct?*

*Practice:*

Ms. Edwards is 5 ft. 5 in. tall. What is her height in inches?

$$5 \cancel{\text{ft.}} \cdot \frac{12 \text{ in}}{1 \cancel{\text{ft.}}} = 60 \text{ in} + 5 \text{ in} = 65 \text{ in.}$$

When completed in 1992, the Bank of America building in Charlotte became the tallest building in Charlotte and North Carolina. It stands 871 feet tall. What is its height in meters?

$$871 \text{ feet} \cdot \frac{1 \text{ m}}{3.28 \text{ feet}} = 265.5 \text{ m}$$



You can also convert rates. For example, you can convert a speed in miles per hour to feet per second.

Because rates compare measures in two different units, you must multiply by two conversion factors to change both units.

Example: miles per hour to feet per seconds

A student ran the 50-yd dash in 5.8 s. At what speed did the student run in miles per hour? Round your answer to the nearest tenth.

$\frac{\text{mi}}{\text{h}}$

**Know**

The running speed in yards per second

✓ yards → miles  
sec → hours

**Need**

The running speed in miles per hour

**Plan**

Write the speed as a ratio. Choose conversion factors so that the original units (yards and seconds) divide out, leaving you with the units you need (miles and hours).

$$\frac{50 \text{ yards}}{5.8 \text{ sec}} \cdot \frac{1 \text{ mile}}{1760 \text{ yards}} \cdot \frac{3600 \text{ sec}}{1 \text{ h}}$$

$$17.63 \frac{\text{mi}}{\text{hr}}$$