

Unit Conversions

Day 1

N.Q.1 Use units of measure (linear, area, capacity, rates, and time) as a way to understand problems

b. Convert units and rates using dimensional analysis (English-to-English and Metric-to-Metric without conversion factor provided and between English and Metric with conversion factor)

What am I learning today?

How to convert from one unit to another in English units

How will I show that I learned it?

Solve a 2-step conversion showing my work or setup

Vocabulary

Unit Conversion - the act of changing the unit of measure, for instance changing 12 inches to 1 foot.

Dimensional Analysis - a process of converting units by using the fact any number or expression can be multiplied by 1 without changing its value.

Find the value of the following expressions.

1. $\frac{8}{8} = 1$

3. $\frac{3y}{3y} = 1$

2. $\frac{x}{x} = 1$

4. $\frac{\text{feet}}{\text{feet}} = 1$

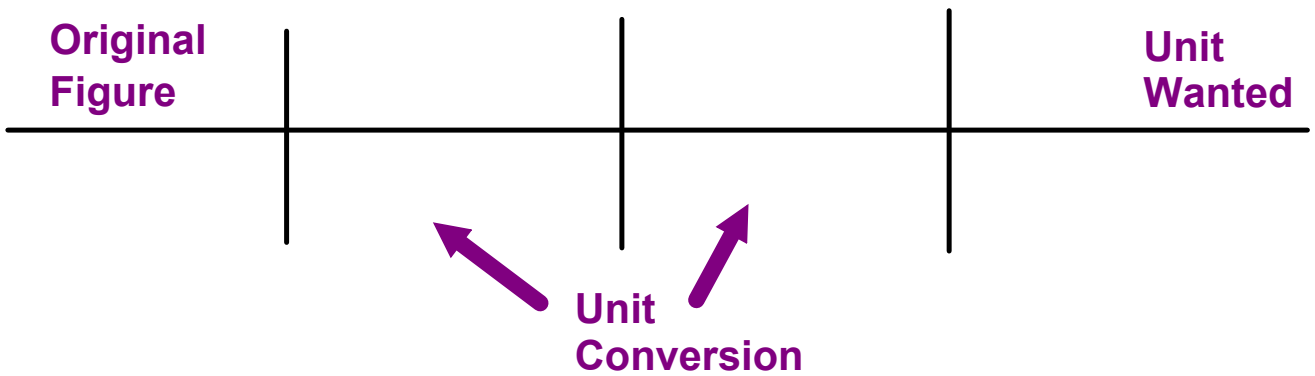
What happens when we divide something by itself? 1

In dimensional analysis, we use equivalent expressions to eliminate units.

Which is more?

- 1. 1 foot or 12 inches?**
- 2. 12 eggs or 1 dozen eggs?**
- 3. 24 hours or 1 day?**
- 4. 1 meter or 100 centimeters?**
- 5. 3.1 miles or 5 kilometers?**

Setting up a dimensional analysis problem:



Example 1 Convert 128 miles into inches.

128 miles	5280 ft	12 inches
	1 miles	1 ft
<u>8,110,080 inches</u>		

Ex 2) Convert 512 seconds to minutes.

$$\frac{512 \text{ seconds}}{60 \text{ seconds}} = \frac{512}{60} \approx 8.5\bar{3} \text{ minutes}$$

Ex 3) Convert 4.8 pounds to ounces.

$$\frac{4.8 \text{ lbs.}}{1 \text{ lbs.}} = 16 \text{ oz.} \times 4.8 = 76.8 \text{ ounces}$$

Ex 4) Convert 15 cups to quarts.

$$\frac{15 \text{ cups}}{4 \text{ cups}} = \frac{15}{4} = 3.75 \text{ quarts}$$

Ex 5) Convert 10.2 cups to quarts.

$$\frac{10.2 \cancel{\text{cups}}}{4 \cancel{\text{cups}}} \times \frac{1 \text{ qt.}}{4 \cancel{\text{cups}}} = \frac{10.2}{4} = 2.55 \text{ qts}$$

Ex 6) Convert 6.3 yards to inches.

$$\frac{6.3 \cancel{\text{yds}}}{1 \cancel{\text{yds}}} \times \frac{3 \cancel{\text{ft}}}{1 \cancel{\text{yds}}} \times \frac{12 \text{ in}}{1 \cancel{\text{ft}}} = \frac{226.8}{1} = 226.8 \text{ inches}$$

Challenge: Convert 75.8 weeks to years.
