

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?

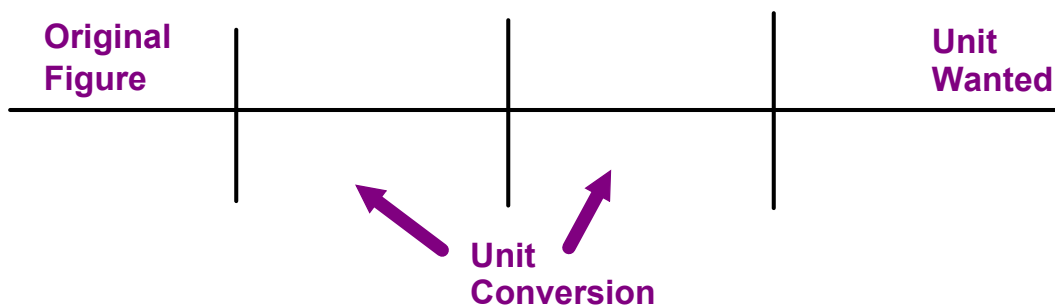
In dimensional analysis, we use equivalent expressions to eliminate units.

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?

} equal

Setting up a dimensional analysis problem:



Example 1 Convert 128 miles into inches.

128 miles	5280 ft	12 (in)
	1 miles	1 ft
$= \frac{8,110,080 \checkmark}{1 \checkmark} = 8,110,080$ inches		

Ex 2) Convert 512 seconds to minutes.

$$\frac{512 \cancel{\text{sec}}}{60 \cancel{\text{sec}}} \left| \frac{1 \text{ min}}{1} \right. = \frac{512}{60} = 8.5\bar{3} \text{ min}$$

Ex 3) Convert 4.8 pounds to ounces.

$$\frac{4.8 \cancel{\text{lbs}}}{1 \cancel{\text{lbs}}} \left| \frac{16 \text{ oz.}}{1} \right. = \frac{76.8}{1} = 76.8 \text{ oz.}$$

Ex 4) Convert 15 cups to quarts.

$$\frac{15 \cancel{\text{cups}}}{2 \cancel{\text{cups}}} \left| \frac{1 \text{ pint}}{2 \text{ pint}} \right| \left| \frac{1 \text{ qts}}{2 \text{ pint}} \right. = \frac{15}{4} = 3.75 \text{ qts}$$

Ex 5) Convert 10.2 cups to quarts.

$$\frac{10.2 \cancel{\text{cups}}}{4 \cancel{\text{cups}}} \left| \frac{1 \text{ qts}}{4 \text{ cups}} \right. = \frac{10.2}{4} = 2.55 \text{ qts}$$

Ex 6) Convert 6.3 yards to inches.

$$\frac{6.3 \cancel{\text{yds}}}{1 \cancel{\text{yds}}} \left| \frac{3 \text{ ft}}{1 \text{ ft}} \right| \left| \frac{12 \text{ in}}{1 \text{ ft}} \right. = \frac{226.8}{1} = 226.8 \text{ inches}$$

Challenge: Convert 75.8 weeks to years.
