

# Dimensional Analysis Review

## Chem Worksheet 11-1

Name \_\_\_\_\_

There are a variety of units that can be used when measuring. For example, the length of an object can be measured in millimeters, centimeters, meters, and even inches. A measurement made in inches can be converted to other units, such as centimeters using a conversion factor. A **conversion factor** is a ratio of two equivalent values expressed with different units.

### Conversion Factors

1 L = 1000 mL	1 km = 1000 m
1 m = 100 cm	1 mm = 1000 $\mu$ m
1 gal = 3.785 L	1 in = 2.54 cm
1 km = 0.6214 mi	1 kg = 2.20 lb
1 yek = 18 mem	1 mem = 180 tezl

To solve conversion problems we use a strategy known as **dimensional analysis**. This technique focuses on canceling units by placing them on the top and bottom of the fractions used to set up a problem. For example, when converting 18 inches to centimeters we place the inches on the bottom of the conversion factor so that they cancel with the inches in the 'given'.

$$\frac{18 \cancel{\text{in}}}{1} \times \frac{2.54 \text{ cm}}{1 \cancel{\text{in}}} = 45.72 \text{ cm}$$

### Example

Convert 25 gallons to liters.

- Write the 'given' over 1.

$$\frac{25 \text{ gal}}{1} \times \quad =$$

- Write the units of the unknown.

$$\frac{25 \text{ gal}}{1} \times \quad = \quad \text{L}$$

- Insert the conversion factor so that units cancel. Solve.

$$\frac{25 \cancel{\text{gal}}}{1} \times \frac{3.785 \text{ L}}{1 \cancel{\text{gal}}} = 95 \text{ L (rounded)}$$

**Convert the following measurements using dimensional analysis. Set up problem using fractions. Cross out the units that cancel. You must show work for credit.**

- Convert 42.3 cm to m.
- Convert the measurement 5.0 km to mi.
- Convert the measurement 150 lb to kg.
- Convert 1.5 tezl to mem.
- Convert 2.00 liters to gal.
- Convert 4.2 L to mL.
- Convert the measurement 1.8 yek to mem.
- Convert the measurement 325 mi to km.
- Convert 180 cm to in.
- Convert 42 mem to yek.