

For all problems, please show the dimensional analysis setup and give the answer to the correct number of significant figures.

Write 2 conversion factors for each of the following pairs of units:

- a) milligrams and grams
- b) microliters and liters
- c) centimeters and kilometers
- d) hours and seconds

2. Use dimensional analysis to solve each of the following problems:

- a) A cooler has a capacity of 5500 mL. What is this capacity in liters?
- b) A hummingbird has a mass of 0.0055 kg. What is this mass in grams?
- c) The thickness of a sheet of aluminum foil is 2.5 μm . What is this thickness in cm?
- d) The height of a student is 5'6". What is this height in meters? (1 in = 2.54 cm)

3. Solve each of the following problems:

- a) The density of a liquid is 11.3 g/mL. How many grams does 32.0 mL of this liquid weigh?

- b) Ethyl alcohol has a density of 0.79 g/mL. What is the volume in mL of 1.5 kg of alcohol?

- c) Potatoes cost \$1.75/lb. If all the potatoes sold at a store cost \$1420, how many kg of potatoes did the shoppers buy? (1 lb = 454 g)

- d) How many mL of olive oil ($d = 0.92$ g/mL) weigh the same as 1.2 L of gasoline ($d = 0.66$ g/mL).

- e) What is the speed of an automobile that is traveling at 55 mi/h in m/s? (1 km = 0.62 mi)