

Chapter 1 – Extra Practice Problems - **KEY**

$$1 \text{ cm}^3 = 1 \text{ mL}$$

$$1 \text{ mile} = 1.6093 \text{ km}$$

$$1 \text{ inch} = 2.54 \text{ cm}$$

$$1 \text{ lb} = 453.59 \text{ g}$$

$$1 \text{ gal} = 4 \text{ qt} = 3.7854 \text{ L}$$

$$16 \text{ dry oz} = 1 \text{ lb}$$

1. Convert 34.5 kg into ng.

$$3.45 \times 10^{13} \text{ ng}$$

2. Convert 7.8×10^3 pm into cm.

$$7.8 \times 10^{-7} \text{ cm}$$

3. If 48.0 quarts of water has a mass of 100.0 lb, what is the volume in liters?

$$45.4 \text{ L}$$

4. How many 250 mg tablets can be made from 3.75 kg of powdered aspirin?

$$1.5 \times 10^4 \text{ tablets}$$

5. Perform the following metric-English conversions:

- a. 800.0 m to yards

$$874.9 \text{ yds}$$

- b. 1250 cL to gallons

$$3.30 \text{ gal}$$

- c. 1.52×10^3 ds to hrs

$$0.0422 \text{ hrs}$$

6. A U.S. Patriot missile has a velocity of 1032 m/s. What is the velocity of the missile in miles per hour?

$$2.309 \times 10^3 \text{ mi/hr}$$

7. The density of carbon tetrachloride is 1.60 g/cm^3 . What is the density of the organic liquid expressed in kg/m^3 ?

$$1.60 \times 10^3 \text{ kg/m}^3$$

8. Table salt melts at 801°C . What is the melting point on the Fahrenheit scale ($^\circ\text{F}$)?

$$1474^\circ\text{F}$$

9. A rectangular block of copper has a mass of 143.584 g and measures 5.05 cm by 2.55 cm by 1.25 cm. Find the density of the copper block.

$$8.92 \text{ g/cm}^3$$

10. Ethanol is used in alcoholic beverages and has a density of 0.789 g/mL . What volume of ethanol, **in liters**, would have a mass of 9.37 lbs?

$$5.39 \text{ L}$$

11. Convert 12.09 in³ into L.

0.1981 L

12. Convert 5.01 lb/ft³ into g/mL

0.0803 g/mL

Harder Problems:

13. If a crown weighing 4 lb 13 oz displaces 186 mL of water when placed in a bathtub, is the crown made of pure gold? (gold $d = 19.31 \text{ g/cm}^3$)

14. A jogger runs at an average speed of 6.5 mi/hr. (a) How fast is she running in m/s? (b) How many kilometers does she run in 115 min? (c) If she starts a run at 11:15 AM, what time is it after she covers 4.75×10^4 ft?

15. The Environmental Protection Agency (EPA) has a standard for microparticulates in air: For particles up to 2.5 μm in diameter, the maximum allowable amount is 50. $\mu\text{g/m}^3$. If your 10.0 ft x 8.25 ft x 12.5 ft bedroom just meets the EPA standard, how many of these particles are in your room? How many are in each 0.500 L breath you take? (Assume the particles are spheres of 2.5 μm diameter and primarily made of soot, a form of carbon with a density of 2.5 g/cm^3 .)

16. Nutritional tables give the potassium content of a standard apple (there are approximately 3 apples in 1 lb) as 159 mg. How many grams of potassium are in 3.75 kg of apples?