1. How many significant digits does each of these measurements have?
   a. 24.3 g   c. 0.05173 mm   e. 0.09040 m
   b. 10.534 L   d. 8.30 kg   f. 32,000.0 ft

2. Perform these operations. Be sure to give answers with the correct number of significant figures.
   a. 8.3 g + 3.76 g   c. 77.0 mL × 8.059 g/mL
   b. 6.3 mL - 5.6 mL   d. 12.17 g ÷ 10.570 mL

3. Perform these conversions. Show your work. Use sig figs.
   a. Convert 77.3 oz to kg. (454g / 1.00 lbs)

   b. Convert 105.0 mL to nL

   c. Convert 0.8050 fl. oz. to mL (4.227 cups / 1.000 liters)

   d. Convert 843.2 g to pounds. (1.000 pound = 0.4536 kg)

   e. Convert 372 nm to inches. (1.00 in = 2.54 cm)

   f. Convert 17.1 m^3 to cm^3

   g. Convert 3.60 •10^{-5} km to yards (1.00 in = 2.54 cm)

4. A substance has a density of 11.35 g/mL.
   a. How many mL would 0.8172 g of this substance occupy?

   b. How many grams would 32.65 mL of this substance weigh?

5. Iridium is the densest element known to date. A sample of Iridium weighing 56.76 g
is placed into a graduated cylinder containing 31.35 mL of water. The combined
volume of the Iridium and water came out to 33.87 mL. What is the <u>density</u> of the
Iridium sample?

6. The velocity of the Earth in its orbit around the sun is 29.8 km/s. Calculate the
velocity of the Earth in <u>miles per hour</u>. Express your final answer in <u>exponential
notation</u>.

7. A 69.0 g sample of a pure liquid, liquid A, with a density of 3.00 g/mL is mixed
with a 60.0 mL sample of a pure liquid, liquid B, with a density of 2.00 g/mL. What is
the total volume of the mixture? (Assume there is no reaction upon the mixing of A
and B and volumes are additive.)

8. Which of the following represents the smallest mass?

41 dg   0.41 g   4.1•10^{-2} cg   4.1•10^{3} ng   0.41 mg

9. You are conducting an experiment where you need the volume of a box; you take the length, height, and width measurements and then multiply the values together to find the volume. You report the volume of the box as 0.311 m^3. If two of your measurements were 0.7120 m and 0.52145 m, what was the other measurement?

10. The calorie, the Btu (British thermal unit), and the joule are units of energy; 1 calorie = 4.184 joules, and 1 Btu = 252.0 calories. Convert 3.03 Btu to joules.

11. One year's worth of worldwide gold production was $4.76 \cdot 10^7$ troy ounces. One troy ounce equals 31.10 g. What was the gold production in metric tons (10^6 g) for that year?

12. An ice cube measures 4.40 cm on each edge and weighs 77.52 g. Calculate the density of ice in g/cm^3.