Worksheet – Scientific notation/
Dimensional analysis

1. The density of a substance is 4.8 g/mL. What is the volume of a sample that is 19.2 g?
2. A 2.00mL sample of substance A has a density of 18.4 g/mL and a 5.00 mL sample of substance B has a density of 35.5 g/mL. Do you have an equal mass of substances A and B?
3. Express each of the following quantities in scientific notation.
    a. 5,453,000 m
    b. 300.8 kg
    c. 0.00536 mg
    d. 0.0120325 km
    e. 34,800 s
    f. 332,080,000 cm
    g. 0.0002383 ms
    h. 0.3049 mL
4. Solve the following problems. Express your answers in scientific notation.
    a. 3×10^2 m + 5×10^2 m
    b. 8×10^{-5} m + 4×10^{-5} m
    c. 6.0×10^5 m + 2.38×10^6 m
    d. 2.3×10^{-3} L + 5.78×10^{-2} L
    e. 2.56×10^2 g - 1.48×10^2 g
    f. 5.34×10^{-3} L - 3.98×10^{-3} L
    g. 7.623×10^5 m - 8.32×10^4 m
    h. 9.052×10^{-2} s - 3.61×10^{-3} s
5. Solve the following problems. Express your answers in scientific notation.
    a. $(8 \times 10^3$ m) × $(1 \times 10^5$ m)
    b. $(4 \times 10^2$ m) × $(2 \times 10^4$ m)
    c. $(5 \times 10^{-3}$ m) × $(3 \times 10^4$ m)
    d. $(3 \times 10^{-4}$ m) × $(3 \times 10^{-2}$ m)
    e. $(8 \times 10^4$ g) / $(4 \times 10^3$ mL)
    f. $(6 \times 10^{-3}$ g) / $(2 \times 10^{-1}$ mL)
    g. $(1.8 \times 10^{-2}$ g) / $(9 \times 10^{-5}$ mL)
    h. $(4 \times 10^{-4}$ g) / $(1 \times 10^3$ mL)
6. Convert each of the following as indicated. Use dimensional analysis.
    a. 3 hrs = _____sec
    b. 0.035 mg = _____cg
    c. 5.5 yds = _____in
    d. 1.3 yrs = _____hr (1 yr = 365 days)
    e. 3 moles = _____molecules (1 mole = 6.02×10^{23} molecules)
    f. 2.5×10^{24} molecules = _____moles
    g. 5 moles = _____liters (1 mole = 22.4 L)
    h. 100 liters = _____moles
    i. 50 liters = _____ molecules
    j. 5.0×10^{24} molecules = _____liters
    k. 7.5×103 mL = _____liters

7. How many minutes are there in 5 days?
8. A car is traveling at 118Km/h. What is its speed in m/min?
9. How many seconds are in 24 hours?
10. The density of gold is 19.3 g/mL. What is gold's density in dg/L?
11. A car is traveling 90 km/hr. What is its speed in mi/min? (One km = 0.62 miles)