WS 7.0 Part I. Intro to Moles!

1. Fill in the blanks:

1 "pair" = _____ socks, etc.
1 "dozen" = _____ eggs, golf balls, etc.
1 "gross" = _____ things
1 "mole" = 6.02 x 10^{23} atoms, molecules, etc.

The number, 6.02 x 10^{23}, is also known as "**Avogadro's Number**" after the Italian scientist, Amadeo Avogadro. It is sometimes abbreviated as N_A. MEMORIZE THIS NUMBER!!!

2a. If you have 2.0 dozen water molecules, how many water molecules is this? _____

2b. If you have 30. eggs, how many dozen eggs is this? _____

3a. If you have 2.00 moles of water molecules, how many water molecules is this?

b. If you have 1.505 x 10^{24} water molecules, how many moles of water is this?

4. How many helium atoms are in 4.6 moles of helium?

5. If you have 1.8 x 10^{21} carbon tetrachloride molecules, how many moles of carbon tetrachloride is this?

6. How many oxygen (O_2) molecules are in 0.00100 moles of oxygen?

7. How many moles of carbon dioxide correspond to 6.5 x 10^{24} molecules?

8. If you have 5.00 moles of water, how many water molecules is this?

9. Determine the number of atoms in each of these molecules.

H_2O_____ F_2_____ SF_6 _____ $C_6H_{12}O_6$_____ (glucose) CF_4_____ P_4O_{10}_____

H_2SO_4_____ (sulfuric acid) $C_{254}H_{377}N_{65}O_{75}S_6$_____ (cow insulin; a protein hormone) I_2_____ CO_2_____

C_8H_{18} _____ (octane, found in gasoline) C_2H_5OH _____ (ethanol) $C_4H_{10}FO_2P$_____ ("sarin," a very toxic nerve agent.) $C_{57}H_{110}O_6$ _____ (tristearin; the main fat found in beef tallow.)

Unit Conversion Mini-Lab!

Station #1 Find the length of the pencil in centimeters, and then convert the length to miles.

_____ cm

Station #2

a. Find the volume of the liquid in mL or cm^3 _____ mL or cm^3

b. The mass of liquid in the grad cylinder is 9.58 g
Calculate the density of the liquid in g/cm^3:

c. Convert the density from g/cm^3 to pounds per cubic foot. (lbs/ft^3).

Station #3

Find the volume of the liquid in the beaker in milliliters, and convert the volume to gallons.
(1 gallon = 3.7854 L)

_____ mL

Station #4

a. Find the length and width of the blue paper, in centimeters. length_____cm width____cm

b. Calculate the area of the paper, in square centimeters:

c. Convert the area from square centimeters to square feet.

Station #5

Find the mass of the paper clip in grams, and then convert it to ounces.
(1 pound = 16 oz (exactly))

_____ g

Station #6

Find the maximum amount of time you can hold your breath in seconds.
(report the time to the nearest 1 second), and then convert that time to days.

_____ s