Chem I Name _____

Date _____ Per _____

Worksheet # C16: Atomic Mass: Grams and the Mole

1. The atomic mass number on the periodic chart tells us two things. It tells us the average number of _____ plus _____ that are in the atoms of that element. It also tells us how many _____ of that element it takes to have _____ x 10^{23} atoms of that element. 6.02 x 10^{23} is called "_____ Number" (after the guy who thought of it first) or just a _____.

2. How many grams of each of the following elements would you need to measure out in order to get one mole of each? (Round your answers to the second place after the decimal.)

a. carbon _____ c. aluminum _____ e. iron_____

b. gold _____ d. silver _____ f. antimony _____

3. There are 6.02 x 10^{23} atoms in 1.00 mole. This makes for two great conversion factors!

a. What are these two conversion factors?

_____ and _____

4. Use these conversion factors (from #3) to solve the following. Show your set-ups. Don't forget units and sig figs!

a. How many atoms of carbon are in 3.85 moles of carbon?

b. If you had 5.98 x 10^{25} atoms of silicon, how many moles would that be?

c. How many atoms of silver are in .00452 moles of silver?

d. If you had 9.31 x 10^{18} atoms of manganese, how many moles would that be?

5. The atomic mass on the periodic table tells us how many grams it takes to have 1.000 mole of the element. For carbon, the mass is 12.01 grams. This makes for two more conversion factors.

a. What are the two conversion factors for 1.000 moles of carbon?

_____ and _____

b. How many grams of carbon would you need to have 2.49 moles of carbon? (Set-up)

c. If you had 200.0 grams of carbon, how many moles would that be? (Set-up)

6. How many grams of lead would you need to have 2.49 moles of lead?

7. If you had 200.0 grams of lead, how many moles would that be?

8. Now put the two kinds of conversion factors (# atoms and moles, moles and grams) together:

a. How many atoms are there in 450.0 grams of carbon?

b. What would be the mass of 4.59×10^{24} atoms of lead?

c. How many atoms are there in 0.762 grams of copper?

d. What would be the mass of 2.98×10^{20} atoms of magnesium?