Assignment:\_\_\_\_\_ Name:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Moles Introduction**

1. Define “Mole”.
2. What is the molar mass of MgO?
3. How are the terms “molar mass” and “atomic mass” different from one another?
4. Which is a better unit for expressing molar mass, “amu” or “grams/mole”?

Below is a diagram that will help to convert from grams to moles to molecules or back



Avogadro’s Number: 6.02 X 1023

**Stoichiometry** is a branch of chemistry that deals with the relative quantities of [reactants](http://en.wikipedia.org/wiki/Reactant) and [products](http://en.wikipedia.org/wiki/Product_%28chemistry%29) in chemical reactions.

Stoichiometry is founded on the [law of conservation of mass](http://en.wikipedia.org/wiki/Law_of_conservation_of_mass): the mass of the reactants equals the mass of the products.

**When we balance equations, we are doing reaction stoichiometry.** N2 + 3H2 → 2NH3

**Reaction stoichiometry** describes the quantitative relationships among substances as they participate in chemical reactions. In the example above, reaction stoichiometry describes the 1:3:2 ratio of molecules of nitrogen, hydrogen, and ammonia. When we balance equations we are doing reaction stoichiometry.

**When we convert grams to moles to molecules and back, we are doing composition stoichiometry.**

**Composition stoichiometry** describes the quantitative (mass) relationships among elements in compounds. For example, composition stoichiometry describes the nitrogen to hydrogen ratio in the compound ammonia: 1 [mol](http://en.wikipedia.org/wiki/Mole_%28unit%29) of ammonia consists of 1 mol of nitrogen and 3 mol of hydrogen. As the nitrogen atom is about 14 times heavier than the hydrogen atom, the mass ratio is 14:3, thus 17 kg of ammonia contains 14 kg of nitrogen and 3 kg of hydrogen. –from Wikipedia

**Molar Mass Practice - *Calculate the molar mass of the following chemicals: Show your work!***

1. KOH
2. BeCl2
3. FeCl3
4. BF3
5. Mg(OH)2
6. SO2
7. H3PO4
8. (NH4)2SO4
9. Pb(NO3)2
10. Ga2(SO3)3

**Mole< - >Grams Calculation Practice - Show your work**

1. How many moles are in 15 grams of lithium?
2. How many grams are in 2.4 mole of sulfur?
3. How many moles are in 22 grams of argon?
4. How many grams are in 88.1 moles of magnesium?
5. How many moles are in 2.3 grams of phosphorus?
6. How many moles are in 9.8 grams of calcium?
7. How many grams are in 238 moles of arsenic?



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