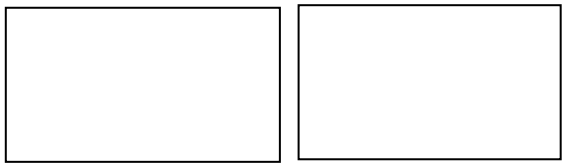
Name _____

Date _____ **Pd** ____

Chemistry - Unit 6 Reaction Equations Worksheet 1

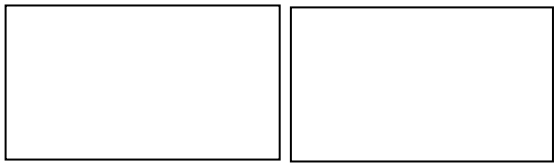
Balance the following equations by inserting the proper coefficients. For selected reactions, draw *Before* and *After* particle diagrams to show the particles involved in the reaction.

1. ____C + ____H_2O → ____CO + ____H_2
2. ____MgO → ____Mg + ____O_2
3. ____Al + ____O_2 → ____Al_2O_3



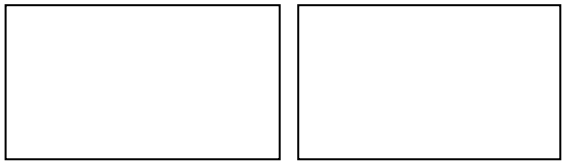
#3 ***Before*** ***After***

4. ____Zn + ____H_2SO_4 → ____$ZnSO_4$ + ____H_2
5. ____Cl_2 + ____KI → ____KCl + ____I_2
6. ____CuCl → ____Cu + ____Cl_2
7. ____Na + ____Cl_2 → ____NaCl
8. ____Al + ____HCl → ____$AlCl_3$ + ____H_2



#8 ***Before*** ***After***

9. ____Fe_2O_3 → ____Fe + ____O_2
10. ____P + ____O_2 → ____P_2O_5
11. ____Mg + ____HCl → ____$MgCl_2$ + ____H_2
12. ____H_2 + ____N_2 → ____NH_3
13. ____$BaCl_2$ + ____H_2SO_4 → ____$BaSO_4$ + ____HCl
14. ____CH_4 + ____O_2 → ____CO_2 + ____H_2O



#14 ***Before*** ***After***

15. a) ____$ZnCl_2$ + ____$(NH_4)_2S$ → ____ZnS + ____ NH_4Cl

b) Find the molar mass of these reactants.

c) How many moles of $ZnCl_2$ would be in 25 g? How much mass would 0.55 moles of $(NH_4)_2S$ have?

Part II: Write the formulas of the reactants and products, then balance the equations. (See Clues and Hints below.)

1. Nitric oxide (NO) reacts with ozone (O_3) to produce nitrogen dioxide and oxygen gas.

2. Iron burns in air to form a black solid, Fe_3O_4.

3. Sodium metal reacts with chlorine gas to form sodium chloride.

4. Acetylene, C_2H_2, burns in air to form carbon dioxide and water.

5. Hydrogen peroxide (H_2O_2) easily decomposes into water and oxygen gas.

6. Hydrazine (N_2H_4) and hydrogen peroxide are used together as rocket fuel. The products are nitrogen gas and water.

7. If potassium chlorate is strongly heated, it decomposes to yield oxygen gas and potassium chloride.

8. When sodium hydroxide is added to sulfuric acid (H_2SO_4), the products are water and sodium sulfate.

9. In the Haber process, hydrogen gas and nitrogen gas react to form ammonia, NH_3.

CLUES and HINTS:

- Products usually follow words like *produces, yields, forms*
- Watch for our diatomic elements (*H_2,N_2, etc…)*, which are often (but not always) gases
- Include 'state subscripts' behind each substance [(s), (l), (g)] when the state is given
- Remember **air** is a mixture of (primarily) two gases, O_2 and N_2. Which is most likely to participate in a reaction?
- Elemental metals exist as single, unbonded atoms. (Ex: formula for copper metal is **Cu**)
- Watch for **ionic** vs **molecular** compounds. Use *nomenclature rules,* and your *ion chart* and *periodic table* to figure out the formulas for these.