Name: _____ Date: _____

Notes: Writing and Balancing Chemical Equations

How would you describe a chemical reaction? _____

_____

Define ***skeleton equation***. _____

Describe **reactants**: _____

Where are the reactants found in a chemical equation? _____

Describe **products**: _____

Where are the products found in a chemical equation? _____

What words are used to show the ***reactants*** interacting in a chemical reaction?

_____

What words are used to show the creation of ***products*** in a chemical reaction?

_____

For each chemical reaction below, select the correct chemical equation, and then balance it.

1. Hydrogen gas reacts with oxygen gas to yield water.

___ H_2O → ___ H_2 + ___ O_2 **OR** ___ H_2 + ___ O_2 → ___ H_2O

2. Ammonia is produced when nitrogen gas reacts with hydrogen gas.

___ N_2 + ___ H_2 → ___ NH_3 **OR** ___ NH_3 → ___ N_2 + ___ H_2

3. Methane combusts in the presence of oxygen to produce carbon dioxide and water.

__ CH_4 + __ O_2 → __ CO_2 + __ H_2O **OR** __ CO_2 + __ H_2O → __ CH_4 + __ O_2

4. Carbon dioxide reacts with water to yield carbonic acid.

___ H_2O + ___ CO_2 → ___ H_2CO_3 **OR** ___ H_2CO_3 → ___ H_2O + ___ CO_2

5. Iron (III) oxide is formed when iron is corroded by oxygen.

___ Fe_2O_3 → ___ Fe + ___ O_2 **OR** ___ Fe + ___ O_2 → ___ Fe_2O_3

6. Magnesium carbonate decomposes into magnesium oxide and carbon dioxide.

__ $MgCO_3$ → __ MgO + __ CO_2 **OR** __ MgO + __ CO_2 → __ $MgCO_3$

Select the correct, balanced equation for each of the chemical reactions described below.

1. In the presence of heat, sodium hydrogen carbonate decomposes into sodium carbonate, water and carbon dioxide.

A $2NaHCO_3 \rightarrow Na_2CO_3 + 2H_2O + CO_2$
B $Na_2CO_3 + 2H_2O + CO_2 \rightarrow 2NaHCO_3$
C $Na_2CO_3 + H_2O + CO_2 \rightarrow 2NaHCO_3$
D $2NaHCO_3 \rightarrow Na_2CO_3 + H_2O + CO_2$

2. Water and carbon dioxide are produced when propane burns in the presence of oxygen.

A $2C_2H_6 + 7O_2 \rightarrow 4CO_2 + 6H_2O$
B $3CO_2 + 4H_2O \rightarrow C_3H_8 + 5O_2$
C $4CO_2 + 6H_2O \rightarrow 2C_2H_6 + 7O_2$
D $C_3H_8 + 5O_2 \rightarrow 3CO_2 + 4H_2O$

3. Sodium metal reacts with water to produce sodium hydroxide and hydrogen gas.

A $2NaOH + 2H_2 \rightarrow 2Na + H_2O$
B $2Na + 2H_2O \rightarrow 2NaOH + H_2$
C $Na + 2H_2O \rightarrow 2NaOH + 2H_2$
D $2NaOH + 2H_2 \rightarrow Na + 2H_2O$

4. Solutions of calcium chloride and sodium carbonate are mixed forming a precipitate of calcium carbonate and aqueous sodium chloride.

A $CaCl_2 + Na_2CO_3 \rightarrow CaCO_3 + 2NaCl$
B $2CaCO_3 + 2NaCl \rightarrow 2CaCl_2 + Na_2CO_3$
C $CaCO_3 + 2NaCl \rightarrow CaCl_2 + Na_2CO_3$
D $2CaCl_2 + Na_2CO_3 \rightarrow 2CaCO_3 + 2NaCl$

5. Solid carbon and hydrogen gas react to form butane.

A $4H_2 + 3C \rightarrow C_3H_8$
B $C_4H_{10} \rightarrow 4C + 5H_2$
C $C_3H_8 \rightarrow 3C + 4H_2$
D $4C + 5H_2 \rightarrow C_4H_{10}$

6. Ammonia neutralizes hydrochloric acid producing ammonium chloride.

A $NH_3Cl \rightarrow NH_2 + HCl$
B $2NH_4 + 2HCl \rightarrow 2NH_4Cl$
C $NH_2 + HCl \rightarrow NH_3Cl$
D $NH_3 + HCl \rightarrow NH_4Cl$

7. The white precipitate lead (II) chloride is formed when table salt is added to a solution of lead (II) nitrate.

A $Pb(NO_3)_2 + 2LiCl \rightarrow PbCl_2 + LiNO_3$
B $Pb(NO_3)_2 + 2NaCl \rightarrow PbCl_2 + 2NaNO_3$
C $Pb(NO_3)_2 + NaCl \rightarrow PbCl_2$
D $Pb(NO_3)_2 + 2NaCl \rightarrow PbCl_2 + NaNO_3$

8. Dinitrogen pentoxide is produced when nitrogen gas reacts with oxygen gas.

A $N_2 + 2O_2 \rightarrow N_2O_4$
B $N_2O_4 \rightarrow N_2 + 2O_2$
C $2N_2O_5 \rightarrow 2N_2 + 5O_2$
D $2N_2 + 5O_2 \rightarrow 2N_2O_5$

9. Aluminum reacts with copper (II) sulfate to produce aluminum sulfate and copper metal.

A $4Al + 3CuSO_4 \rightarrow 2Al_2(SO_4)_3 + 3Cu$
B $2Al + 3CuSO_4 \rightarrow Al_2(SO_4)_3 + 3Cu$
C $Al_2(SO_4)_3 + 3Cu \rightarrow 2Al + 3CuSO_4$
D $2Al_2(SO_4)_3 + 3Cu \rightarrow 4Al + 3CuSO_4$