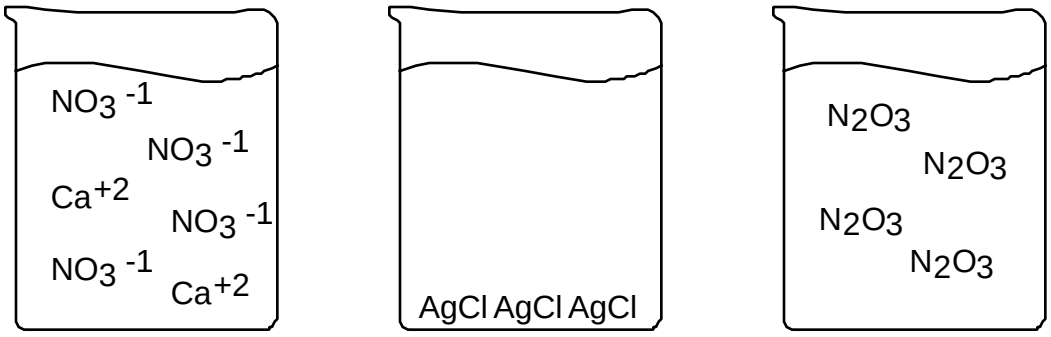
Equation Review Sheet

- You should feel comfortable writing formulas from names and names from formulas. Try going to the ChemTeam website for extra practice in doing this (http://dbhs.wvusd.k12.ca.us/webdocs/Nomenclature/Nomenclature.html). Try looking at the 1st, 2nd, 4th, and 5th tutorials for guides and practice problems at the bottom of those pages. You can also redo some of our homework sheets. You will find the answers if you open the homework sheet online and scroll to the last page.
- You should be able to balance equations.
- You should be able to categorize an equation into one of the five types we have discussed (synthesis, decomposition, single replacement, double replacement, and combustion)
- Given a word description of a reaction you should be able to write a balanced chemical reaction showing what happened using formulas.
- What are the reactants and what are the products in a chemical equation?
- You should understand conceptually why we balance an equation. (Conservation of mass, unchangeable identity of atoms in chemical reactions.)
- Understand how the balanced equation shows the simplest whole number ratio for how substances react together to form new substances.
- You should understand how various substances dissolve in water. You should be able to illustrate this. For example:

Calcium Nitrate	Silver Chloride	Dinitrogen Trioxide
$Ca(NO_3)_2$	AgCl	N_2O_3
Ionic	Ionic	Molecular
soluble in water	insoluble in water	soluble in water



- What is the difference between an ionic compound and a molecular compound?
- What is a precipitate and when will it form?
- **You should be able to explain why "like dissolves like", or in other words, why polar things dissolve in polar thing and non-polar things dissolve in non-polar things.**
- You should be able to use the proper states of matter in your equations (g), (s), (l), and (aq). For example: Sodium metal reacts with water to form sodium hydroxide and hydrogen.

$$2\ Na_{(s)} + 2\ H_2O_{(l)} \text{ ----> } 2\ NaOH_{(aq)} + H_{2(g)}$$

  Try adding these to your Common Chemical Reactions equations.
- You should be able to take a paragraph description of what happens in a reaction and write this out as a balanced chemical equation.

• Things to watch out for and memorize:
  - Pure elements don't have a charge.
  - Don't forget about the seven diatomic elements: H_2, N_2, O_2, F_2, Cl_2, Br_2, I_2
  - Memorize the three acids: Nitric (HNO_3), Sulfuric (H_2SO_4), and Acetic ($HC_2H_3O_2$)
  - Hydroxide (OH^{-1}) is a polyatomic ion and requires parentheses if you want more than one. For example, NaOH and $Ca(OH)_2$
  - Think about the type of substance (element, ionic, molecular, acid) before writing any names or formulas.

Fill in the table below: (Type of substance = ionic, molecular, acid, element)

1)Magnesium Sulfide	_____	_____
2) _____	_____	HNO_3
3) Nitrogen	_____	_____
4) Hydrobromic acid	_____	_____
5) sulfer dioxide	_____	_____
6 Lead (IV) oxide	_____	_____

Balance the following:

7) $CH_4 + O_2 \rightarrow CO_2 + H_2O$

8) $S + O_2 \rightarrow SO_3$

9) $FeS_2 + O_2 \rightarrow Fe_2O_3 + SO_2$

Write the proper balanced chemcial equations:

10) iron(III) bromide + ammonium sulfide ----> iron(III) sulfide + ammonium bromide

Type_____

11) calcium oxide + diphosphorus pentoxide ----> calcium phosphate

Type_____

12) aluminum + copper(II) chloride ----> aluminum chloride + copper

Type_____

13) calcium hydroxide + nitric acid ----> calcium nitrate + water

Type_____

Given the following descriptions, write balanced chemcial reactions with states of matter (s),(l),(g), or (aq):

14) Some people have high iron in their water. This causes rust stains to form in their sinks and toilets. Several rust removing chemicals that you can buy contain hydrochloric acid which reacts with the rust. Write a chemical equation showing how hydrochloric acid reacts with rust (Fe_2O_3) to form iron(III) chloride and water.

15) Let's say you wanted to make a little hydrogen as part of a project to simulate the Hindenburg disaster. You know that when metals are combined with acids, hydrogen, and an ionic compound are produced. What would happen if you reacted the zinc from inside a new penny with the sulfuric acid that is in your car battery.

16) Your in that creative mood again and want to make one of those silly fake snow displays, the kind you have in water and shake so that the fake snow falls inside. One way to make fake snow is to make a precipitate. If you reacted calcium chloride solution with silver nitrate solutions, you would get a double replacement reaction. Would a precipitate form? Write out the chemical reaction below.

Three key homework assingments that would be worth redoing are:
- Naming Various Chemicals:
  http://chemsite.lsrhs.net/ChemicalBonds/handouts/Naming_Various_Chemicals.pdf
- Types of Reactions:
  http://chemsite.lsrhs.net/ChemicalBonds/handouts/Types_of_reactions.pdf
- Solubility Questions:
  http://chemsite.lsrhs.net/ChemicalBonds/handouts/solubilityQuestions.pdf

Answers to above:

1)Magnesium Sulfide	ionic_____	MgS
2) Nitric Acid	acid_____	HNO_3
3) Nitrogen	element_____	N_2
4) Hydrobromic acid	acid_____	HBr
5) sulfer dioxide	molecular_____	SO_2
6) Lead (IV) oxide	ionic_____	PbO_2

7) $CH_4 + 2\ O_2 \rightarrow CO_2 + 2\ H_2O$

8) $2\ S + 3\ O_2 \rightarrow 2\ SO_3$

9) $4\ FeS_2 + 11\ O_2 \rightarrow 2\ Fe_2O_3 + 8\ SO_2$

10) $2\ FeBr_3 + 3\ (NH_4)_2S \rightarrow Fe_2S_3 + 6\ NH_4Br$ Type: double replacement

11) $3\ CaO + P_2O_5 \rightarrow Ca_3(PO_4)_2$ Type: synthesis

12) $2\ Al + 3\ CuCl_2 \rightarrow 2\ AlCl_3 + 3\ Cu$ Type: single replacement

13) $Ca(OH)_2 + 2\ HNO_3 \rightarrow Ca(NO_3)_2 + 2\ H_2O$ Type: double replacement

14) $6\ HCl_{(aq)} + Fe_2O_{3(s)} \rightarrow 2\ FeCl_{3(aq)} + 3\ H_2O_{(l)}$

15) $Zn_{(s)} + H_2SO_{4(aq)} \rightarrow H_{2(g)} + ZnSO_{4(aq)}$

16) $CaCl_2 + 2\ AgNO_{3(aq)} \rightarrow Ca(NO_3)_{2(aq)} + 2\ AgCl_{(s)}$ yes AgCl is the precipitate