Pre-AP Chemistry Chapter 7: Chemical Formulas and Compounds

1. Binary ionic compounds are two element compounds that form between monatomic ions.
Ex: Na^{+} and Cl^{-} form NaCl
Mg^{2+} and Br^{-} form $MgBr_2$

Compounds composed of cations and anions are called ionic compounds.

2. A chemical formula shows the kinds and numbers of atoms in the smallest representative unit of a substance. A **formula unit** is the lowest whole-number ratio of ions in an ionic compound.

NaCl is the formula unit for sodium chloride. It shows a one to one ratio of ions

3. Be able to write formulas of binary ionic compounds

- Cation always written first, then anion
- Charges must add up to be zero!
- NO CHARGES are written in final formula
- Find the least common multiple of the charges to determine how many ions of each element belong in the formula.

Ex: aluminum chloride
Al^{3+} Cl^{1-} Cl^{1-} Cl^{1-} formula is $AlCl_3$

lead(IV) oxide
Pb^{4+} O^{2-} O^{2-} formula is PbO_2

4. Nomenclature:
To name a binary ionic compound, write the cation name first, then the anion name. The nonmetal (anion) name should end with –ide.
Ex: $MgBr_2$ is magnesium bromide
$ZnCl_2$ is zinc chloride
KI is potassium iodide

5. Ternary Ionic Compounds are ionic compounds containing polyatomic ions.

Polyatomic Ions are groups of covalently bonded atoms that act as a unit and carry an overall charge. Ex: Milk of Magnesia is composed of magnesium hydroxide. Hydroxide, OH^{1-} is a polyatomic ion.

<u>Polyatomic ions to MEMORIZE!!</u>

Ammonium	NH_4^{1+}	Nitrate	NO_3^{1-}
Acetate	CH_3COO^{1-}	Nitrite	NO_2^{1-}
Hydroxide	OH^{1-}	Carbonate	CO_3^{2-}
Cyanide	CN^{1-}	Sulfate	SO_4^{2-}
Permanganate	MnO_4^{1-}	Sulfite	SO_3^{2-}
Chlorate	ClO_3^{1-}	Chromate	CrO_4^{2-}
Chlorite	ClO_2^{1-}	Phosphate	PO_4^{3-}
Hypochlorite	ClO^{1-}		