Ionic/Metallic Bonding

1) Ionic bonds – between metal/nonmetals or metals/polyatomic ions. Give/Take electrons.
2) Valence electrons – electrons in the highest occupied energy level. Determines chemical properties and electron configurations.
3) Find the # of valence electrons by looking at the column #.
4) Octet rule – when forming compounds atoms tend to achieve the electron configuration of a noble gas (8 electrons in the valence shell)
    - Ion formation – how they are formed and stability of ions (filled/half filled levels)
    - Metals tend to lose electrons (cations),while nonmetals tend to gain electrons (anions).
    - Compare charges to the periodic table/valence electrons.
    - Although composed of ions ionic compounds are electrically neutral. Therefore the charges must cancel out.
    - Electrostatic charge holds compounds together.
5) Chemical formula shows the kinds and ratios of atoms in the smallest representative unit.
6) Representative unit for an ionic compound is a formula unit (FU). Always in the lowest ratio.
7) Properties of ionic compounds
    - Usually solid at room temp.
    - Arranged in repeated patterns (crystals) Brittle.
    - Generally high MP/BP.
    - Conduct electricity when melted or dissolved in water. Electrolytes
    - $\Delta EN > 1.7$
8) **Activity – identify whether or not something is ionic or covalent via conductivity meters. Explain why some things conduct that you didn't think would conduct. You bet your grade activity.**
9) Metals have a sea of electrons. Metallic bonds is an attraction of the free-floating electrons for positively charged metal ions.
10) Metallic Bonding Properties
    - High MP/BP
    - High conductivity
    - Malleable, ductile and luster
    - Usually solid at room temperature

Rd: pg 187-203
HW: #1, #2, #3

Covalent Bonding

1) Covalent Bonding – bond between two nonmetals. Share electrons.
2) Representative unit is called a molecule. Still electrically neutral. Molecular compound.
3) Molecular formula – the ratio of atoms in a covalent compound. DO NOT reduce the ratio like we did in ionic compounds.
4) Properties of Covalent compounds
    - Usually a gas or liquid at room temp.
    - Does not conduct electricity when melted or dissolved in water. Sometimes Poorly conducts. Non-electrolyte. Polar Nature of solvent.
    - Different "type" of patterns. Will learn in VSEPR.
    - Generally low MP/BP.
    - $\Delta EN < 1.7$ Closer to 0 is non polar and closer to 1.7 is polar
5) Octet rule still applies, but you share to obtain this now.

Rd. pg 213-217
HW: #4, #5

Nomenclature

1) **Activity – students will use white boards and magnetic ions to practice as we go over naming in class.**
2) IONIC – reduce the number
3) Monatomic ion – single atom ion. With charges from periodic table. Anions end it -ide. Cations use the same word as the element.
4) Transition elements – charges aren't as predictable. Use compounds to find out charge or the roman numeral.
5) Polyatomic ions – more than one atom. Ending in -ite or –ate. Some exceptions.
6) Binary Compounds – examples with elements, element/polyatomic ion, transition metal/element/polyatomic ion.
    - Keys cross the charges (only numbers not signs)
7) COVALENT – do NOT reduce the number
8) Uses of prefixes. Table 9.4 pg 267
    - Keys do not use mono in front of the first part of a covalent compound, but use it for the second part.
9) Naming acids/bases
    - Table 9.5 pg 272 for acids
    - Bases are just like any other ionic compound.
    - Hydrochloric, nitric, sulfuric, acetic acids KNOW.

Rd. pg 253-273
HW: #6-#9