        - Have properties between those of metals and nonmetals
    - Elements in a group have similar chemical properties
    - Elements in a period have different chemical properties
    - There is a gradatio in properties from left to right and top to bottom
    - Family Names
        - Group 1A - Alkali Metals
        - Group 2A - Alkaline Earth Metals
        - Group 7A - Halogens
        - Group 8A - Noble Gases
        - Group 3A - 6A - are often named for the first element in the group

Compounds: Introduction to Bonding

- Transferring electrons from one element to another to form ionic compounds
- Sharing electrons between atoms of different elements to form covalent compounds
    - These processes generate chemical bonds, the forces that hold the atoms together in a compound
- The Formation of Ionic Compounds
    - Ionic compounds are composed of ions
        - Ions - charged particles that form when an atom gains or loses one or more electrons
    - The simplest type of ionic compound is a binary ion compound
        - Binary ion compound - one composed of two elements
        - Typically forms when a metal reacts with a nonmetal
        - Each metal loses one or more electrons and becomes a cation, a positively charged ion
        - Each nonmetal atom gains one or more of the electrons lost by the metal atom and becomes an anion, a negatively charged ion.
    - A cation or anion derived from a single atom is called a monatomic ion
    - The Case of Sodium Chloride
        - All binary ionic compounds are solid arrays of oppositely charged ions
        - The oppositely charged ions attract each other, and the similarly charged ions repel each other
    - Coulomb's Law
        - The strength of the ionic bonding depends to a great extent on the net strength of these attractions and repulsions
        - The energy of attraction (or repulsion) between two particles is directly proportional to the product of the charges and inversely proportional to the distance between them