Neutralization Reactions

- When acids and bases react, the undergo a **Neutralization Reaction**
  - Acids have a low pH (0-6)
  - Bases have a high pH (8-14)
  - Neutral substances have a pH of 7
- When you mix acids (low pH) and bases (high pH) the pH of the mixture tends to go to 7
  - Because substances with a pH of 7 are neutral, we call the mixing of acids and bases a neutralization reaction
- During a neutralization reaction
  - An acid and a base are the **reactants**
  - A salt and water are the **products**
    - Salts are compounds that have a positive ion bound to a negative ion
    - Table Salt is NaCl
      - Na is the positive ion
      - Cl is the negative ion
    - All salts will completely dissolve in water
    - Salts often make bright colors and are used to make pigments for paints and dyes:
      - Sodium Chromate (Na_2CrO_4) is bright yellow
      - Potassium Dichromate ($K_2Cr_2O_7$) is bright orange
      - Copper (II) Sulfate ($CuSO_4$) is bright blue
      - Nickel Chloride ($NiCl_2$) is bright green
      - Potassium Permanganate ($KMnO_4$) is bright purple
  - Acids are usually written with an 'H' in front of another element
    - Ex. HCl, HBr, H_2SO_4
  - Bases are usually written with an 'OH' behind another element
    - Ex. NaOH, KOH
  - Neutralization reactions usually look like this:

Acid Base Salt Water

$$HCl + NaOH \rightarrow NaCl + H_2O$$