Unit 3 – Bonding   **STUDY GUIDE**
   Chapter 7 – Ionic & Metallic Bonding
   Chapter 8 – Covalent Bonding
   Chapter 9 – Chemical Names & Formulas

Vocabulary

- Ionic bonds
- Metallic bonds
- Octet rule
- Valence electrons
- Lewis Dot structure
- Alloy
- Covalent Bond
- Diatomic molecule
- Bond dissociation energy
- Dipole interactions
- Dispersion forces

- Hydrogen bonding
- Molecule
- Polar molecule
- Polar covalent bond
- Nonpolar covalent bond
- Unshared (lone) pair
- VSEPR theory
- Binary compound
- Polyatomic ion
- Acid

Equations

No specific equations for this unit

Core Concepts

- How to find the number of valence electrons in at atom of a representative element
- Which elements lose electrons & become cations?
- Which elements gain electrons and become anions?
- Creating/interpreting electron dot structures
- What is the Octet Rule?
- What is an ionic compound?
- Properties of ionic substances
- Chemical formula and name for ionic solids
- Structure of ionic compounds & how that influences properties of ionic solids
- How are metal atoms arranged?
- How do valence electrons behave in metallic bonds?
- Properties of metals
- What is an alloy?
- What is a molecular compound? How are molecules held together?
- Properties of molecular compounds
- Molecular formulas
- Applying Octet Rule in covalent bonding
- Creating Lewis Dot Structures
- Exceptions to Octet Rule (Boron w/ fewer than octet; S, Cl, P w/ more than octet)
- Calculating Bond Dissociation Energy

- What is VSEPR theory?
- Electron and Molecular Geometry of Molecules & how bonding/nonbonding domains influence geometry
  - Linear
  - Bent
  - Trigonal Planar
  - Trigonal Pyramidal
  - Tetrahedral
- Bond Polarity and electronegativity difference
  - Nonpolar covalent
  - Polar covalent
  - Ionic
- Intermolecular attractions
  - Dispersion forces
  - Dipole interactions
  - Hydrogen bonds
- Naming binary and ternary ionic substances
- How to name compounds when the cation has more than 1 possible charge (Roman numerals)
- Provide a chemical name, given an formula; provide a formula given an name
- Naming binary molecular compounds
- Naming Acids
- Identifying Bases