**Chemistry Study Guide**

**Chapter 3: Matter – Properties and Changes**

* **3.1: Properties of Matter**
  + **Essential Questions**
    - Describe the characteristics that identify a sample of matter as being a substance.
    - Create a list of properties of matter as physical or chemical
    - Create a table that describes the three common states of matter in terms of their shape, volume, and compressibility.
  + **Big Ideas**
    - A substance is a form of matter with a uniform and unchanging composition.
    - Physical properties can be observed without changing a substances composition.
    - Chemical properties describe a substances ability to combine with or change into one or more new substances.
    - The three common states of matter are solid, liquid, and gas.
  + **Vocabulary**
    - Physical property
    - Chemical property
    - States of matter
* **3.2: Changes in Matter**
  + **Essential Questions**
    - Describe the results of a physical change and list three examples of a physical change. (Do the same for a chemical change).
    - Classify a list of changes in matter as physical or chemical.
  + **Big Ideas**
    - In chemical reactions, reactants form products.
    - Matter is neither created nor destroyed in a chemical reaction.
  + **Vocabulary**
    - Physical change
    - Chemical change
    - Law of conservation of mass
* **3.3: Mixtures of Matter**
  + **Essential Questions**
    - How do mixtures and substances differ?
    - Consider a mixture of water, sand, and oil. How many phases are present? How could you separate these three substances?
    - Classify a list of mixtures as either homogenous or heterogeneous.
  + **Big Ideas**
    - A mixture is a physical blend of two or more pure substances.
    - Solutions are homogenous mixtures.
    - Mixtures can be separated by physical means. Common separation techniques include filtration, distillation, crystallization, and chromatography.
  + **Vocabulary**
    - Mixture
      * Heterogeneous
      * Homogeneous
* **3.4: Elements and Compounds**
  + **Essential Questions**
    - How are elements and compounds similar? How are they different?
    - What is the basic organizing feature of the periodic table of elements?
    - Explain how the law of definite proportions applies to compounds.
  + **Big Ideas**
    - Elements are substances that cannot be broken down in to simpler substances by chemical or physical means.
    - The elements are organized in the periodic table of elements.
    - A compound is a chemical combination of two or more elements.
  + **Vocabulary**
    - Element
    - Periodic table
    - Compound
    - Law of proportions
    - Percent by mass