**Chemistry Study Guide**

**Chapter 1: Introduction to Chemistry**

* **NGSS Standards:**
  + HS-PS1-7 Use mathematical representations to support the claim that atoms, and therefore mass, are conserved during a chemical reaction.
* **Math Standards**
  + MP.2 Reason abstractly and quantitatively. (HS-PS1-7)
* **Essential Questions:** 
  + **1.2: Chemistry and Matter**
    - What is matter?
    - What is the difference between mass and weight?
    - Why does chemistry involve the study of the changes in the world at a submicroscopic level?
  + **1.3: Scientific Methods**
    - Explain why a scientist must be cautious when a new chemical that has many potential uses is synthesized.
    - What is the scientific method? What are its steps?
    - You are asked to study the effect of temperature on the volume of a balloon. Identify the independent and dependent variable.
    - What is technology? Give examples of technology that you use every day.
    - Explain the reason behind each of the following: wear goggles and an apron in the lab even if you are only an observer, report all accident to the teacher, do not return unused chemicals to the stock bottles.
* **Big Ideas:**
  + **1.2: Chemistry and Matter**
    - Chemistry is the study of matter and the changes it undergoes.
    - Matter is anything that has mass and take up space.
    - Mass is a measure of the amount of matter
    - Weight is a measure of not only of an amount of matter but also the effect of Earth’s gravitational pull on that matter.
  + **1.3: Scientific Methods**
    - Macroscopic observations of matter reflect the actions of atoms on a submicroscopic scale.
    - Typical steps of the scientific method include observations, hypothesis, data analysis and conclusion.
    - Qualitative data describe an observation: quantitative data use numbers.
    - Any independent variable is a variable you change in an experiment and a dependent variable changes in response to a change in the independent variable.
    - A theory is a hypothesis that has been supported by many experiments.
    - A scientific law describes relationship in matter.
    - Scientific methods can be used in research.
    - Laboratory safety is the responsibility of anyone who conducts and experiment.
    - Many of the conveniences we enjoy today are technological applications of chemistry.
* **Vocabulary**
  + **1.2: Chemistry and Matter**
    - Chemistry
    - Matter
    - Weight
    - Mass
  + **1.3: Scientific Methods**
    - Scientific method
      * Data
        + Qualitative data
        + Quantitative data
      * Hypothesis
      * Experiment
      * Variable
        + Independent variable
        + Dependent variable
      * Control
      * Conclusion
    - Model
    - Law
    - Theory
    - Research
    - Technology