**Chemistry Concepts** Name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Chapter 1: Matter and Change

1-1: Chemistry is a Physical Science

**Chemistry** - study of …

**Chemical** - any substance that has ...

* sucrose

**Branches of Chemistry**

* 1. Organic chemistry—the study of …
* 2. Inorganic chemistry—the study of …
* 3. Physical chemistry—the study of the properties and changes of matter and their relation to energy
* 4. Analytical chemistry—the identification of the components and composition of materials
* 5. Biochemistry—the study of …
* 6. Theoretical chemistry—the use of mathematics and computers to understand the principles behind observed chemical behavior and to design and predict the properties of new compounds

1-2: Matter and Its Properties

**Matter**

* **Matter** - anything that …
* **Volume** - amount of …
* **Mass** - measure of …
* **atom** - smallest unit …
* **element** - pure substance that …
* **compound** - substance that …

**Properties and Changes in Matter**

* **Extensive properties** depend on …
* **Intensive properties** do not …

**physical property** - characteristic that can be …

* + melting point and …
* **physical change** - change in a substance that …
  + change of state, …

**States of Matter**

* **Solid -** matter has definite …
* **Liquid -** matter has a definite …
* **Gas -** matter has neither ...
* **Plasma -** \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ physical state of matter in which \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Chemical Properties and Chemical Changes**

* **chemical property** - substance’s ability to …
* **chemical change** or **chemical reaction -** change in which …
* **Reactants** – beginning substances that ...
* **Products** - substances that ...

**Energy and Changes in Matter**

* Energy is …
* Energy can be ...
* Energy can be \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_, it is **not** \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

Law of conservation of energy

**Classification of Matter**

* **mixture** - blend of two or more kinds of matter, each of which …
  + mixed together \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
  + can usually be \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
* **Homogeneous** mixtures are called \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
  + uniform in composition (example: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_)
* **Heterogeneous** mixtures
  + not uniform throughout (example: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_)

**Pure Substances**

* A **pure substance** has a fixed \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.
* Pure substances are either \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ or \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.
* A pure substance differs from a mixture in the following ways:
  + Every sample of a given pure substance has …
  + Every sample of a given pure substance has ...
  + Water is always 11.2% hydrogen and 88.8% oxygen by mass.

1-3: Elements

**Introduction to the Periodic Table**

* The vertical columns of the periodic table are called **\_\_\_\_\_\_\_\_\_\_\_** or **\_\_\_\_\_\_\_\_\_\_\_\_.**
  + Each group contains elements with similar \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.
* The horizontal rows of elements in the periodic table are called **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.** 
  + Physical and chemical properties change somewhat regularly \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.
* **Types of Elements**
* **metal** - element that is a good \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ and a good \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.
  + Properties of metals
    - most are solids at …
    - malleable - they can be …
    - ductile - they can be …
    - conduct …
* **nonmetal** - element that is a poor \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ of heat and \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.
  + Properties of nonmetals
    - many are …
    - solids are …
    - poor conductors of …
* **Metalloid –** has some characteristics of \_\_\_\_\_\_\_\_\_\_\_ and some characteristics of \_\_\_\_\_\_\_\_\_\_\_\_\_\_.
  + Properties of metalloids
    - all metalloids are solids at \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
    - semiconductors of \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
* **Noble Gases** 
  + elements in \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ of the periodic table
  + generally \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
  + gases at \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_