**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 \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_