**What is matter made of…**

* All matter in the universe is made up of more than 100 different substances, called elements.

**What is an Element?**

* A substance that cannot be broken down into other substances by physical or chemical means.
  + The simplest substances.
  + Each element is identified by its specific physical or chemical properties.
  + Elements are represented by one or two letter symbols. (chemical symbols)
    - C is the symbol for Carbon
    - Ca is the symbol for Calcium

**Quiz question1:** The simplest type of substance is a \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

**Particle Theory of Matter**

* All matter is made up of atoms!
* Atoms are the basic particles or all elements.
  + A positively charged center(nucleus) containing smaller particles.
  + A small cloud of negatively charged particles surrounding the nucleus.
* Atoms of most elements combine with other atoms
  + Form a chemical bond
    - A force of attraction between two atoms
    - Can combine to form larger particles called molecules
      * A group of two or more atoms held together by a chemical bond

**Compounds**

* A substance made of two or more elements that are chemically combined in a set ratio are compounds.
* Compounds are represented by chemical formulas
  + Tells you the elements in the compound and the ratio of atoms. EX: H2O \_\_atoms of Hydrogen, \_\_ oxygen

**Quiz question2:** The ration of hydrogen atoms to sulfur atoms in sulfuric acid, H2SO4 is\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

**Quiz question3:** Compounds are formed as a result of \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

* When elements chemically combine they form compounds with different properties from those elements.

**Quiz question4:** When elements combine to form compounds, their properties **do not** change, T or F.

**Compounds v. Mixtures**

* Elements and compounds are substances but most materials are mixtures.
* Two or more substances not chemically bonded, but **together** in the same place are **mixtures**.
* The substances in the mixture each **keep** their **own** properties.
* **Mixtures DO NOT have chemical formulas** (biggest difference)

**Types of mixtures**

* **Homogeneous**
* So evenly mixed you cannot see the different parts.
* Difficult to separate into its original parts
* Ex: air (Oxygen, nitrogen, carbon dioxide, argon & many others)
* **Heterogeneous**
* Can see the different substances
* Can easily be separated out
* Ex: salad

**How do you separate a mixture?**

* Use each substances properties to separate them.
* Some methods include:
  + **Distillation**
  + **Evaporation**
  + **Filtration**
  + **Magnetic attraction**

**Quiz question 5:** Salad dressing is an example of this mixture type: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

**Quiz question 6:** The chemical \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ for water is H2O.

**Quiz question 7:** A mixture of iron and sulfur can be separated by \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

**Quiz question 8:** A molecule is the smallest part of\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.