**Name \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Date \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Period \_\_\_\_\_**

**01 – Matter and Atomic History**

**Part 1: Matter**

Chemistry is the study of **matter**, “the stuff things are made of”. Depending on the pressure and the temperature, matter can exist in one of three phases (solid, liquid, or gas).

In each of the shapes below, draw a particle view of the substance in that phase:

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

|  |  |  |  |
| --- | --- | --- | --- |
|  | **SOLID** | **LIQUID** | **GAS** |
| **PARTICLE ARRANGEMENT** | ORDERED / DISORDERED | ORDERED / DISORDERED | ORDERED / DISORDERED |
| **DENSITY DESCRIPTION** |  |  |  |
| **DEFINITE SHAPE?** | YES / NO | YES / NO | YES / NO |
| **DEFINITE VOLUME?** | YES / NO | YES / NO | YES / NO |
| **COMPRESSIBILITY** |  |  |  |

Matter can be classified as being either a **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_** or a **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**. *A pure substance has unique composition and properties.* For example, water is a pure substance (whether from Argentina or Zimbabwe, each water molecule always contains a ratio of \_\_\_\_ atoms of hydrogen for 1 atom of \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_). This is the law of \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

There are only two kinds of pure substances: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ and  **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.** *Elements are the simplest form of matter and cannot be broken down into another pure substance with different properties.* Some examples of elements are:

*Compounds can be broken down into two or more pure substances.*

For example:

1. Glucose can be broken down into \_\_\_\_, \_\_\_\_, and \_\_\_\_.
2. Table salt can be broken down into \_\_\_\_\_\_\_\_\_\_\_\_ and \_\_\_\_\_\_\_\_\_\_\_\_\_.

Compounds made of only two substances are called \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ compounds.

A mixture can be classified as either homogeneous or \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

In the space below draw the particle view of each type of mixture and provide examples of each.

**Part 2: Atomic Structure**

|  |  |  |  |
| --- | --- | --- | --- |
|  | **Proton** | **Neutron** | **Electron** |
| **Symbol** |  |  |  |
| **Location** |  |  |  |
| **Mass** |  |  |  |
| **Charge** |  |  |  |

Define Isotope:

What are the 3 main isotopes of Carbon?

Which modern scientific lab equipment led to the discovery of isotopes?

Discuss the experiments and conclusions of each of the following scientists with respect to their contribution to Modern Atomic Theory

John Dalton:

J.J. Thomson:

Ernest Rutherford:

Niels Bohr: