Name \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Date \_\_\_\_\_\_\_\_ Block \_\_\_\_\_\_\_\_

**Identifying Elements**

**Lab**

A Greek philosopher named **Democritus**, who lived over 2000 years ago, taught people that all things were made of grains which could not be divided. He called these grains ***atomos*** because in Greek *atomos* means “*uncuttable”*. Today, *atom* is the common name for the tiny particles of matter that cannot be further divided.

An atom is made up of **protons, neutrons and electrons**. Both protons and neutrons are found in the nucleus of the atom while electrons are located in the orbits surrounding the nucleus. Protons are positively charged particles, neutrons are neutral (no charge) and electrons are negatively charged. The **atomic number** of an atom is equal to the number of protons in the nucleus of the atom or the number of electrons in the orbits. These numbers are equal to each other because atoms are electrically neutral (p = e-). The **atomic mass** of an atom is equal to the number of protons plus neutrons located in the nucleus of the atom, (p + n).

**Procedure**:

1. Each petri dish is representative of an element. The **Black Beans represent protons** and the **Great Northern Beans neutrons**.
2. **Count the number of protons** (black beans) and enter this number onto the data table for the petri dish number you are working with.
3. **Count the number of neutrons** (great northern beans) and enter this number onto the data table for the petri dish number you are working with.
4. **Determine the Element Name, Element Symbol, Atomic Number, Atomic Mass and Electron Number** using your data and your periodic table.

**Data Table**: (p=e-) (p+n) (p) (n) (e-)

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Petri Dish Number** | **Element** | **Symbol** | **Atomic** **Number** | **Atomic****Mass** | **Protons** | **Neutrons** | **Electrons** |
| **1** |  |  |  |  |  |  |  |
| **2** |  |  |  |  |  |  |  |
| **3** |  |  |  |  |  |  |  |
| **4** |  |  |  |  |  |  |  |
| **5** |  |  |  |  |  |  |  |
| **6** |  |  |  |  |  |  |  |
| **7** |  |  |  |  |  |  |  |
| **8** |  |  |  |  |  |  |  |
| **9** |  |  |  |  |  |  |  |
| **10** |  |  |  |  |  |  |  |

**Analysis**:

1. Who was the first person to identify atoms?
	1. What did he call them?
		1. What did that mean?
2. What parts of an atom are found in the **nucleus**?
	1.
	2.
3. Where are **electrons** found? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
4. What **charges** do each of the parts of an atom have:
	1. Protons = \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
	2. Neutrons = \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
	3. Electrons = \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
5. What is **atomic number**: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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

* 1. Why? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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

1. What is **atomic mass**? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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

1. Look at **Element #1**, from the data table above, and draw its atomic structure correctly. (**Orbit 1 = 2, Orbit 2 = 8, Orbit 3 = 8, Orbit 4 = 18**).

**Name**: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Symbol**: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Atomic Number**: \_\_\_\_\_\_\_\_\_\_\_\_\_

**Atomic Mass**: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

p = \_\_\_\_

n = \_\_\_\_