

Name \_\_\_\_\_

Lab # \_\_\_\_\_: **Building an Atom/ Isotopes (Chromebook Activity)**

**Purpose:** In this activity you will determine the charge, mass, and location of the 3 subatomic particles. You will build various samples of atoms to identify the factors that determine the different qualities about the element, including its identity, common charges, stability, etc. You will then determine the difference between isotopes of the same element.

**Materials:** Chromebook, Reference Tables

**Procedure:**

**Part A: Properties of the Atom**

1. Open Google Classroom and click on the **“Build An Atom”** Assignment. (If you are not a member of our class yet, please refer to the code on the whiteboard).
2. Click on the **Atom** icon.
3. Click on the (+) for net charge and mass number. This should open the boxes.
4. The X on the atom represents the location of the nucleus and the dotted rings are the orbitals.
5. Drag a **proton** from the bucket and bring it to the center of the atom.
  - a) What is the charge? \_\_\_\_\_
  - b) Where does it go in the atom? \_\_\_\_\_
  - c) What is the mass number? \_\_\_\_\_
6. Drag the proton back to the bucket.
7. Drag a **neutron** from the bucket and bring it to the center of the atom.
  - a) What is the charge? \_\_\_\_\_
  - b) Where does it go in the atom? \_\_\_\_\_
  - c) What is the mass number? \_\_\_\_\_
8. Drag the neutron back to the bucket.
9. Drag an **electron** from the bucket and bring it to the center of the atom.
  - a) What is the charge? \_\_\_\_\_
  - b) Where does it go in the atom? \_\_\_\_\_
  - c) What is the mass number? \_\_\_\_\_



### Part C: Isotopes

1. Go back to Google Classroom and click on the **“Isotopes and Atomic Mass”** assignment.
2. Click on the **Isotopes** icon.
3. Open the Symbol and Abundance boxes by clicking on the (+).
4. In the table below, fill in the symbol and abundance for the default element, Hydrogen-1.
5. Drag a neutron from the bucket to the H-1 atom. Fill in the new symbol and abundance in the table.
6. Using the periodic table in the upper right hand corner, along with the bucket of neutrons, you can now fill in the remainder of the table.

<b>Isotope</b>	<b>Symbol</b>	<b>Abundance</b>
Hydrogen-1		
Hydrogen-2		
Nitrogen-14		
Nitrogen-15		
Boron-11		
Boron-10		
Oxygen-16		
Oxygen-18		
Lithium-7		
Lithium-6		

**Analysis Questions:**

1. What are the location, charge and mass of:
  - a. Proton \_\_\_\_\_
  - b. Neutron \_\_\_\_\_
  - c. Electron \_\_\_\_\_
2. Which subatomic particles contribute to the mass number of an atom?
3. Which subatomic particle determines the atomic number?
4. Why can atoms of the same element have different mass numbers?
5. How does an atom become an ion?
6. What is the relationship of protons to electrons in a **neutral atom**?
7. What is the relationship of protons to electrons in an **ion**?
8. In terms of protons and neutrons, compare and contrast  ${}^1_1\text{H}$  and  ${}^3_1\text{H}$ .

9. In terms of protons and neutrons, compare and contrast  ${}^3_2\text{He}$  and  ${}^3_1\text{H}$ .

10. How does the atomic mass on the periodic table give you an idea about what the most abundant isotope for that element might be? Use an example from the activity to support your answer.