Name:_____ **Date:_____**

How do Atoms Differ?

Atoms, Ions and Isotopes

Atoms differ in the amounts of protons, neutrons and electrons an atom or element has. We have discussed how changing the number of protons creates new elements. Today you will be exploring how changing the number of electrons and neutrons alters an atom.

Using the colored chips and your knowledge of atomic models and atomic mass, create each atomic model including protons, neutrons and electrons. In each model be sure to use different color chips to represent each subatomic particle.

Create a Key - What color are your subatomic particles

Protons- ◯

Neutrons- ◯

Electrons- ◯

1. With the chips, make a model of the neutral atom **Oxygen**.
   Take a **picture** of your model and insert it below.

2. **Draw** the following neutral atoms and their Lewis Dot structures: **Li** **F** **Ne** **He**

3. Which elements would be considered stable (Clue: They are also un-reactive gases)? Why?

4. Which of these elements have a stable electron configuration.

5. How are the number of **electrons** different in an **ion** than in a **neutral atom**?

6. With the chips, make a model of the following ions: **(Have N+3 checked by the teacher!)** Take a **picture** of your models. Create a key for the color of the protons, neutrons and electrons.

Li^{+1} **F^{-1}** **N^{+3}**

7. Would the **ions** above have stable electron configurations? Why or why not?

8. Find the atomic mass of the ions above (protons = 1amu, neutrons = 1amu, electrons = 0.00amu).

9. When you make an ion, does its **mass** change? Why or Why not?

10. With the beads, make a model of the following isotopes: Take a **picture** of your models.

$^{10}_{4}$Be $^{3}_{2}$He $^{10}_{8}$O

11. Find the mass of the isotopes above.

12. When you make an isotope does its' mass change? Why or why not?

13. How are **Oxygen-16**, **Oxygen-17**, and **Oxygen-18** similar? How are they different?