Atom Builder Activity Name_____ **Date**_____ **Period**_____
Online: http://phet.colorado.edu/en/simulation/build-an-atom
In Class: Click the play button over the picture then choose ATOM
Build an Atom

1. Click the two green "+" signs on the right hand side of the screen and click STABLE/UNSTABLE in the SHOW box at the bottom of the screen.

2. Answer the following questions first. Then build the atom on the computer to check.
   a. Look at a Periodic Table and find Beryllium (Be)
   b. How many protons are in a neutral Beryllium atom? p =Z =____

   c. How many neutrons are in a neutral Beryllium atom?
   (Show work: formula, substitution, computation)

   d. How many electrons are in a neutral Beryllium atom?

   e. Build the Beryllium atom in the simulator with your information listed in parts b-d. Draw the correct model for Beryllium here.

   f. How many valence electrons (number of electrons on the last level of the cloud farthest from the nucleus) are in a Beryllium atom? ____

   g. What do you think will happen to the charge of Beryllium if you remove all the valence electrons? I think _____.
   Use the simulator to check and see if you are correct.

   h. If you were not correct, what did happen? _____.

   i. As a metal, Beryllium will lose electrons until its original valence level is empty. How many valence electrons will Beryllium need to lose to accomplish this? Beryllium needs to lose ____ valence electrons to empty the valence to become stable.

   j. What do you see is the charge on a Beryllium ion in the simulator? _____

   k. Remake the stable neutral Beryllium atom. Remove one neutron from it.

   l. What word appears on the screen to describe the nucleus now?_____

   m. What is an atom called when the number of neutrons changes?_____

   n. What is the new mass of this Beryllium atom? A =____

   o. To make an _____ change the electrons. To make an _____ change the neutrons. To change the identity of the element change the

3. Click the orange reset button in the bottom right of the screen. Click the two green "+" signs on the right hand side of the screen and click STABLE/UNSTABLE in the SHOW box at the bottom of the screen.

4. You will answer the following questions first and then build the atom on the computer to check your responses.
   a. Look at a Periodic Table and find Nitrogen (N)
   b. How many protons are in a neutral Nitrogen atom? p =Z =____

   c. How many neutrons are in a neutral Nitrogen atom?
   (Show work: formula, substitution, computation)

   d. How many electrons are in a neutral Nitrogen atom?

   e. Build the Nitrogen atom in the simulator with your information listed in parts b-d. Draw the correct model for Nitrogen here.

   f. How many valence electrons (number of electrons on the last level of the cloud farthest from the nucleus) are in a neutral Nitrogen atom? ____

   g. As a nonmetal, Nitrogen will gain electrons until its valence level is full with 8 electrons. How many valence electrons will Nitrogen need to gain to have a full valence shell? Nitrogen needs to gain ____ valence electrons.

   h. Add this number of electrons to your Nitrogen model in the simulator.

   i. What do you see is the charge of this Nitrogen ion? _____

5. Write the complete chemical symbol for Beryllium with a mass of 9 that is neutral and another to show that it has lost 2 electrons

6. Write the complete chemical symbol for Nitrogen with a mass of 14 that is neutral and another to show that it has gained 3 electrons.

7. Conclusion: What does the number and charge in the oxidation state of an positive ion represent? What does the number and charge in the oxidation state of a negative ion represent?

8. Click the tab at bottom of the screen that says "Game"
   There are 5 questions in each game set. Play each game once and record your score below. Call me over when you have completed this activity.

Game 1 _____ Game 2 _____ Game 3 _____ Game 4 _____