

Building An Atom

PART I: ATOM SCREEN

- Go to the website: phet.colorado.edu. Click on HTML5 simulations on top right of screen and choose the Build an Atom simulation (<http://phet.colorado.edu/en/simulation/build-an-atom>)
- Explore the Build an Atom simulation. Click on the + sign for each of the boxes (element name, net charge and mass number) to view changes as you change the number of particles in the atom.
- What particle(s) are found in the center of the atom? _____
- Play with the simulation to discover which **particle(s)** determine(s) the name of the **element** you build?

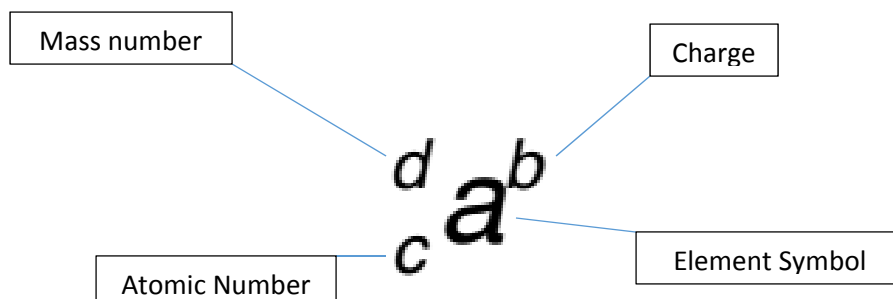
- What is the **name** of the following atoms?
 - An atom with 3 protons and 4 neutrons: _____
 - An atom with 2 protons and 4 neutrons: _____
 - An atom with 4 protons and 4 neutrons: _____
- Play with the simulation to discover which particles affect the charge of an atom or ion.

- Fill in the blanks with words or phrases to make a coherent sentence:
 - Adding **protons** _____ so a proton must have a charge of _____.
 - Adding **neutrons** _____ so a neutron must have a charge of _____.
 - Adding **electrons** _____ so an electron must have a charge of _____.
 - What could be a rule (in the form of a single sentence or equation) to determine the **charge** of an atom?
 - To find the charge of an atom you _____
_____.
- Play with the simulation to discover which **particle(s)** affects the mass number of your atom or ion.

 - What could be a rule for determining the mass number of an atom?
 - To find the mass number of an atom you _____
_____.
- Test your knowledge by playing the first and second game.

PART II: SYMBOL SCREEN

- Using the Symbol readout box, figure out and take notes on which particles affect each component of the atomic symbol and how the value of the numbers is determined.



- Practice applying your understanding by playing the 3rd and 4th game levels.

PART II: ISOTOPES

12. Play with the simulation to determine:
- Which particles affect the stability of the atom? _____
 - Which particles do not affect the stability of the atom? _____
13. What are the names of the stable forms of oxygen?
- Oxygen-16
 - Oxygen-____
 - Oxygen-____
14. The atoms in the previous question are isotopes of each other. Based on this information:
- Isotopes are _____
15. In addition to atomic symbol, we can represent atoms by name and mass number. Complete the table below:

Symbol	Name
$^{12}_{6}\text{C}$	Carbon-12
	Carbon-14
$^{7}_{3}\text{Li}$	

16. Test your knowledge by using a periodic table to help complete the following table:

<u>Nuclide</u>	<u>Atomic #</u>	<u>Mass #</u>	<u># of Protons</u>	<u># of Electrons</u>	<u># of Neutrons</u>
Helium-4					
Carbon-____					8
Boron-11					
Silicon-____		29			
Copper-63					
Arsenic-75					
Bromine-____					45
Gold-197					
Radon-222					
Uranium-____		238			