

Part I: Basic Electron Structure

1. Where are the electrons located inside of the atom?
2. How many electrons can fit in the second energy level?
3. Build **three different atoms**, and write down three examples that have a *stable nucleus* and *neutral charge*. This time, do not draw individual protons and neutrons; just draw one small dot for the nucleus. *Be sure to draw the electrons in the correct energy levels.*

Picture of Atom

Electrons: _____ Protons: _____ Charge: _____		Name: _____ Symbol: _____
Electrons: _____ Protons: _____ Charge: _____		Name: _____ Symbol: _____
Electrons: _____ Protons: _____ Charge: _____		Name: _____ Symbol: _____

Analysis Questions:

1. From your observations, how can you predict the number of electrons in a neutral atom? Explain your answer.
2. **Without using the simulation, draw 2 atoms** you have not yet made in the simulation. Pay attention to the electrons, and only pick an element in the first two rows of the periodic table.

Part II: Making Ions

1. Make a neutral Beryllium atom. What would you do to make a beryllium atom with a *negative* charge?
2. Make the neutral Beryllium atom again. What would you do to make a beryllium atom with a *positive* charge?
3. Expand the box labeled “Net Charge”. Pick an element, and make two examples of the same element with different charges in the table below. Include what the charge is (sign and number), and how many protons and electrons are in the atom.

Name of element: _____ Symbol: _____

<i>Example 1</i>	<i>Example 2</i>
Charge: _____	Charge: _____
Electrons: _____	Electrons: _____
Protons: _____	Protons: _____

4. What did you do to change “Example 1” to “Example 2”?

5. Repeat the last process for a *different* element. Make two examples with different charges.

Name of element: _____ Symbol: _____

<i>Example 1</i>	<i>Example 2</i>
Charge: _____	Charge: _____
Electrons: _____	Electrons: _____
Protons: _____	Protons: _____

6. Based on your observations, make a rule or formula to predict the charge of the atom if you are given the number of protons and electrons.

7. Now you will practice building some specific ions. In the table below, some of the information is filled out about a particular element. Complete the table below by filling in the blanks and drawing the picture of that ion.

Picture of Ion

Electrons: 10 Protons: _____ Charge: _____		Element: <i>Oxygen</i> Symbol: _____ Name: _____
Electrons: 2 Protons: 3 Charge: _____		Element: _____ Symbol: _____ Name: _____
Electrons: _____ Protons: _____ Charge: - 1		Element: <i>Fluorine</i> Symbol: <i>F</i> Name: _____
Electrons: _____ Protons: 19 Charge: +1		Element: _____ Symbol: _____ Name: _____
Electrons: 18 Protons: _____ Charge: _____		Element: _____ Symbol: <i>Cl</i> Name: _____

8. Fill in the blanks for the following **IONS**

Remember:

In an **ION** # Protons \neq # Electrons

An **ION** is an **Atom** that has gained or lost **electrons**

A **positively** charged ion has **lost** electrons (Charge of 2+ means it lost 2)

A **negatively** charged ion has **gained** electrons (Charge of 3- means it gained 3)

	Element and Mass Number	Symbol	# Protons	# Electrons	# Neutrons
Ex.	Lithium – 7	Li ⁺	3	2	4
A	Tin – 119	Sn ²⁺	___	___	___
B	Magnesium – 25	___	___	10	___
C	_____	Na ⁺	___	___	12
D	_____	___	4	2	5
E	_____	O ²⁻	___	___	8
F	Cobalt – 59	Co ²⁺	___	___	___
G	Selenium – 79	___	___	36	___
H	_____	Ca ²⁺	___	___	20
I	_____	___	79	76	118
J	Gallium – 69	___	___	28	___
K	_____	Pt ⁴⁺	___	___	117