Name _____ PBS: Chemical Bonds

Fill in the following information as you go through the chemical bond simulation.

1. The chemical bonds that join atoms together to form molecules and compounds are a result of:

   _____

2. What are the three common types of bonds:

   _____, _____ and _____

3. In an ionic bond, electrons are _____ from one atom to another.

   In a covalent bond, electrons are _____ between two atoms.

   In a metallic bond, electrons are _____ between many atoms.

4. What is it that bonds the atoms together? _____

5. Click on Metallic Bonding at the top of the page.

   a. Atoms of copper and zinc can bind together to form _____.

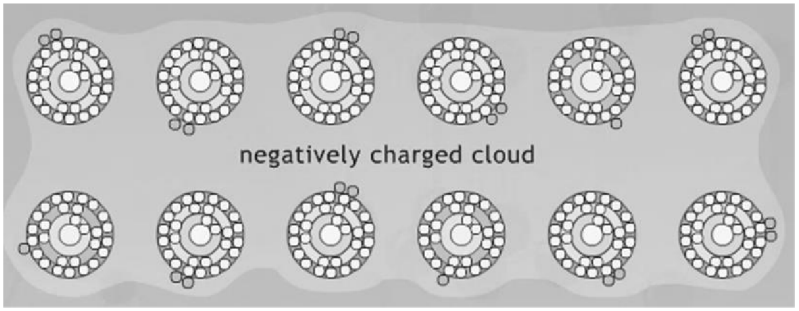
   b. How many valence electrons does copper have? _____ Zinc? _____

   c. The outer electrons form an _____. What does "the cloud moves as a unit" mean? _____

   d. What is the pull between that binds the metal atoms together?

   _____

   e. Draw a picture below of what metallic bonding looks like.



   f. When a voltage is applied to a metal(s), what happens to the electrons? _____

6. Next click on Covalent Bonding at the top of the page.

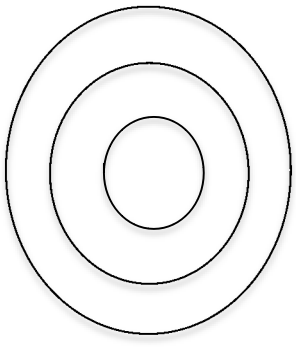
   a. When bonding two atoms of oxygen and one atom of carbon, what compound will be formed?

   _____

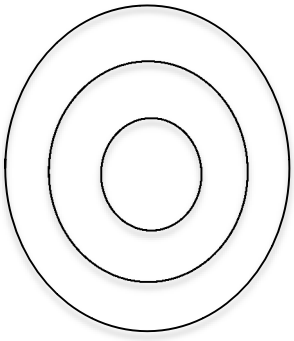
   b. How many valence electrons does carbon have? _____ Oxygen? _____

   c. Draw the diagrams of carbon atom and oxygen atom.

Carbon



Oxygen

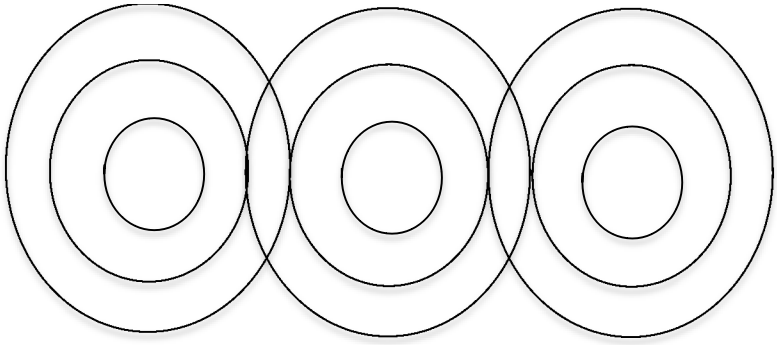


d. Atoms with incomplete outer shells sometimes _____ their outer electrons.

When they do, the total number of electrons in their outer shell is often equal to _____.

- to complete its outer shell, carbon needs _____ more electrons, and the oxygen atom needs _____ more.

e. Using the space below, draw how one carbon atom and two oxygen atoms arrange themselves to form a bond.



f. Looking at the picture drawn above, how many total electrons are shared between the carbon and oxygen atom on the left? _____ On the right? _____

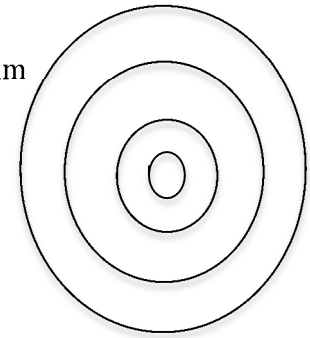
g. The atoms in a covalent bond are held together by the _____

_____

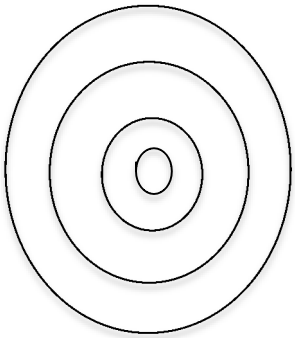
7. Next click on Ionic Bonding at the top of the page.

a. Draw the arrangement of a sodium atom and a chlorine atom below.

Sodium



Chlorine



b. How many valence electrons does sodium have? _____ When sodium loses the valence electron, what does its overall charge become? _____ What does it now become?

_____ _____ _____

c. How many valence electrons does chlorine have? _____ When chlorine gains the valence electron, what does its overall charge become? _____ What does it now become?

_____ _____ _____

d. Draw the Ionic bond that forms between sodium and chlorine (sodium chloride).