

Name \_\_\_\_\_ Date \_\_\_\_\_

## Octet Rule

### Introduction:

When the chemical formula for a compound is written correctly, it shows the number of each type of atom in the compound. Those numbers, called subscripts, are determined by the bonding between the atoms. Example  $\text{H}_2\text{O}$ . The table below shows two columns of elements. The columns next to the elements show the number of electrons in the outer level or valence electrons. Every chemical compound must have a total of 8 electrons in its outer shell in order to form a chemical compound. In order for this chemical compound to form, the outer shells of each element involved must have its outer shell complete. The octet rule states it takes 8 electrons to complete an atom's outer shell. Example:  $\text{Na} + \text{S} = \text{Na}_2\text{S}$ . Na has one electron in its outer shell, while Sulfur has 6 in its outer shell. The Sulfur needs 2 electrons to fill its 2 spaces to complete its outer shell of 8. It takes 2 Na atoms to fill the 2 spaces in the sulfur atom. Examine the chart below. You are about to create the 10 chemical compounds listed. Notice the valence electrons are given for each of the reactants. If they have less than 8 they must either give or take electrons from their partner. If they have 4 or less they will give their electron(s), if they have more than 4 they will take the electron(s) they need. This giving and taking forms the chemical. Determine if each element on the table gives or takes an electron and mark it accordingly on the table.

Use the symbols of each of the elements and form the chemical compound asked for. Notice that each symbol has 1 or more black lines attached to it. These lines represent their bonding capacity based on their valence electrons. After forming the compound write out its formula in the last column on the table.

Use your cut out elements to complete the following chart.

Element	Valence Electrons	Give or Take	Element	Valence Electrons	Give or Take	Formula
Aluminum	3		Chlorine	7		
Magnesium	2		Bromine	7		
Sodium	1		Oxygen	6		
Lithium	1		Oxygen	6		
Calcium	2		Phosphorus	5		
Carbon	4		Chlorine	7		
Aluminum	3		Oxygen	6		
Beryllium	2		Sulfur	6		
Sodium	1		Fluorine	7		
Silicon	4		Neon	8		