

**CHECKPOINT:** *Naming ALL compounds*

Characteristics of Compound/Name	Type of Compound
<b>Metal + Nonmetal;</b> <b>Roman Numeral</b> for Trans. Metals	
2 or more <b>Nonmetals;</b> <b>prefix</b> is present	

*Indicate whether the following compounds are ionic, covalent, or acidic. Name accordingly:*

Name/Formula	Ionic/covalent	Formula/Name
a. $N_4O_6$		
b. $AlCl_3$		
d. $CrNO_3$		
e. nickel (II) carbonate		
f. boron trioxide		
g. $Na_3PO_4$		

## WS-Naming *ALL* compounds

Complete the table below by either writing the name or the formula and they type of compound/molecule

Formula	Ionic/Covalent	Name
		Sodium Fluoride
K <sub>3</sub> N		
		Sulfur hexafluoride
		Calcium nitrate
P <sub>4</sub> O <sub>10</sub>		
CSe <sub>2</sub>		
		Manganese (IV) oxide
		Iron (III) Chloride
		Ammonium Sulfate
PdF <sub>2</sub>		
SO <sub>3</sub>		
		Dinitrogen trioxide
		Phosporous trichloride
CdBr <sub>2</sub>		
SiCl <sub>4</sub>		
		Aluminum Phosphate
		Titanium (II) Chloride
Al <sub>2</sub> (SO <sub>4</sub> ) <sub>3</sub>		
		Zinc Phosphate
XeF <sub>4</sub>		
		Silver nitrate
		Oxygen difluoride
		Potassium sulfate

## Summary: Types of Bonding

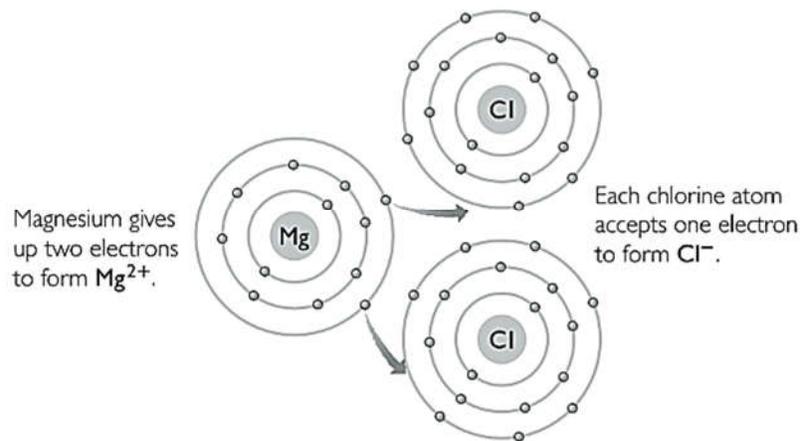
- **Compound**=a substance that has \_\_\_\_\_ different types of \_\_\_\_\_ bonded together
- **Bond**=a region that forms when \_\_\_\_\_  
The attraction between 2 or more atoms allows for the formation of a compound.
  - Only \_\_\_\_\_ electrons participate in bonding
- **Octet Rule**
  - Atoms bond in order to get \_\_\_\_\_ valence electrons around them (Exception: Hydrogen)

## Types of Bonds:

### **Ionic Bonds:**

- Made up of a \_\_\_\_\_ and a \_\_\_\_\_
- Electrons are \_\_\_\_\_ from the \_\_\_\_\_ to the \_\_\_\_\_
- Even though the compound is made up of 2 or more charged ions, the compound overall has \_\_\_\_\_
  - This means that the total charge of the \_\_\_\_\_ + total charge of \_\_\_\_\_ = 0

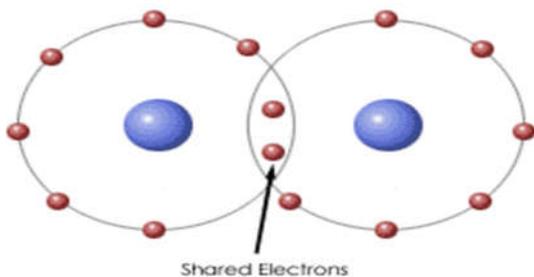
### Magnesium Chloride



$Mg^{2+} + Cl^- + Cl^-$  produces  $MgCl_2$  with zero charge.

### Covalent Bonds

- Formed between a \_\_\_\_\_
- Involves the \_\_\_\_\_ of valence electrons



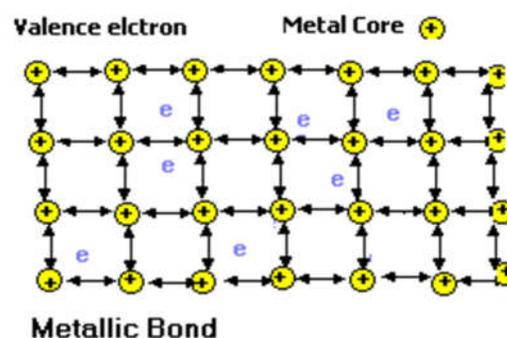
**Metallic Bonding:** What kind of bonds holds atoms of metals (i.e. copper, silver, gold) together?

- Metals tend to \_\_\_\_\_ their valence electrons to obtain a noble gas electron configuration
- In a metallic solid, each atom will \_\_\_\_\_ their \_\_\_\_\_ to neighboring atoms
- There is a **constant movement of electrons** (aka “\_\_\_\_\_”) throughout the entire metallic solid since none of the atoms “wants” the electrons
  - Think of it as a big game of “Hot Potato”
  - The constant movement of valence electrons is what makes solid metals



Cu      Cu

Cu      Cu



**Summary Chart**

Fill in the following table regarding the differences between the types of compounds you’ve learned about so far this unit.

	<b>Ionic Compounds</b>	<b>Covalent (Molecular) Compounds</b>	<b>Metals</b>
<b>Made up of...</b> (metal, nonmetal)			
<b>Electrons are....</b> (transferred, shared, constantly moving)			
<b>Physical Properties:</b> (high vs low BP/MP...does or does not conduct)	_____ melting point & boiling point <ul style="list-style-type: none"> <li>• Solids _____ conduct electricity</li> <li>• When dissolved in water: _____ conduct electricity</li> </ul>	<ul style="list-style-type: none"> <li>• _____ melting point &amp; boiling point</li> <li>• Solids _____ conduct electricity</li> <li>• When dissolved in water: _____ conduct electricity</li> </ul>	<ul style="list-style-type: none"> <li>• _____ melting point &amp; boiling point</li> <li>• Solids _____ conduct electricity</li> </ul>
<b>Relative Strength</b>			

## Types of Bonds WS:

1. Give three characteristics of ionic compounds.
2. Compare table sugar, sucrose ( $C_{12}H_{22}O_{11}$ ) and table salt, sodium chloride (NaCl) when answering the following:
  - a. Which has a higher melting point? Why?
  - b. Which is a better conductor of electricity when dissolved in water? Why?
3. What is the difference between a covalent bond, an ionic bond, and a metallic bond?
4. Would a metallic bond or covalent bond have a higher boiling point? Why?
5. What is a sea of electrons and how does it affect metallic bond properties?
6. If you held a glass rod and a copper wire in a flame, which would eventually feel warm in your hand? Why??

7. Decide if the description represents IONIC bonding or COVALENT bonding

\_\_\_\_\_ It is a non conductor of electricity, whether it exists as a solid, melted, or dissolved in water.

\_\_\_\_\_ It is a nonelectrolyte in the solid form, but it can become a good conductor when melted or dissolved in water.

\_\_\_\_\_ The building blocks of this type of compound are called ions.

\_\_\_\_\_ The building blocks of this type of compound are called molecules.

\_\_\_\_\_ The electrons are transferred from one element to another to form this type of bond.

\_\_\_\_\_ The electrons are shared in between elements in this type of bond.

9. Rank from ionic, covalent and metallic from strongest to weakest strength between molecules

10. Which has the highest boiling point, ionic, metallic or covalent? Why?