

# Virtual Laboratory

## Topic 03 – Structure of Matter

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Name

Section #

Date

Topic #

1. Draw the dot structures for the following 6 elements using the periodic table in the textbook.

**H      O      N      S      Cl      F**                      ○      ●

2. Draw the dot structures for the following molecules:

Formula	Name	Dot Structure (Covalent bonds)
H <sub>2</sub>	dihydrogen	
F <sub>2</sub>	Diflourine	
Cl <sub>2</sub>	dichlorine	
NH <sub>3</sub>	ammonia	
H <sub>2</sub> O	water	
H <sub>2</sub> S	Hydrogen sulfide	

Draw the dot structures for the following 8 elements using the periodic table in the textbook.

**Mg      Br      K      Al      Cl      Na      S      O**

4. Draw the dot structures for the following molecules:

Formula	Name	Dot Structure (Ionic bonds)
NaCl	Sodium chloride	
MgBr <sub>2</sub>	Magnesium Bromide	
K <sub>2</sub> S	Potassium sulfide	
Al <sub>2</sub> O <sub>3</sub>	Aluminum oxide	

# STRUCTURE OF MATTER

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Name \_\_\_\_\_

Section # \_\_\_\_\_

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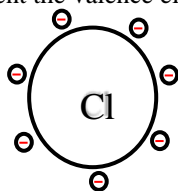
## Part A: Atomic models of atoms (the tiny circles represent electrons)

Identify the name of each of the elemental models and record the name next to its assigned letter in each square. Next to that indicate the chemical symbol. For assistance review the periodic table of the elements. Each element is identified by the number of protons in the nucleus.

<p>A _____</p>	<p>B _____</p>	<p>C _____</p>
<p>D _____</p>	<p>E _____</p>	<p>F _____</p>
<p>G _____</p>	<p>H _____</p>	<p>I _____</p>
<p>J _____</p>	<p>K _____</p>	<p>L _____</p>

## Part B: Electron-dot models that represent atoms

Using the Periodic Table and the models pictured, select the correct model for each of the elements listed. Please note that we have not included the symbol as part of the model. You are just considering the electrons for your selection. The tiny circles represent the valence electrons.



Chlorine

 Model A	 Model B	 Model C	 Model D
 Model E	 Model F	 Model G	 Model H
 Model I			

Fill in the table below based upon the pictures above. Use the Periodic Table to determine the number of valence electrons for each element listed below, and then select the picture above that represents the number of valence electrons.

	Element	Model
1.	Hydrogen	
2.	Helium	
3.	Beryllium	
4.	Boron	
5.	Carbon	
6.	Nitrogen	
7.	Oxygen	
8.	Fluorine	

	Element	Model
9.	Neon	
10.	Sodium	
11.	Magnesium	
12.	Silicon	
13.	Chlorine	
14.	Potassium	
15.	Copper	
16.	Tin	

**Part C: Drawing Models that represent atoms**

From the following list. **Sodium Iodide. Potassium Chloride. Hydrochloric (one Hydrogen and one chlorine). Zinc Chloride. Methane (Carbon and four Hydrogen). or Carbon Disulfide.** complete the electron dot models in the spaces provided below. Indicate the compounds name. type of bond (Ionic or Covalent). its symbol. and charge where appropriate.

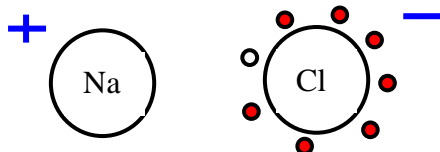
If working online perform the following. (otherwise just handwrite the required information):

To place the symbol on the drawing. copy and paste one of the following: Na. I. K. Cl. H. Zn. C. and S.

To place the name on the drawing. copy and paste one of the following: **Sodium Iodide. Potassium Chloride. Hydrochloric. Zinc Chloride. Methane.** or **Carbon Disulfide.**

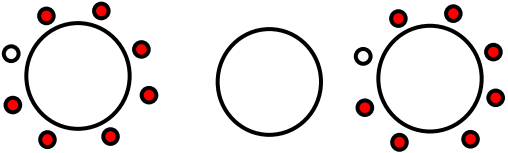
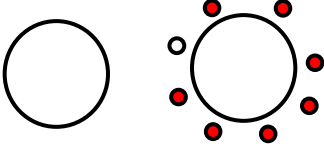
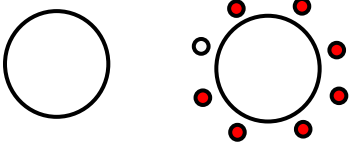
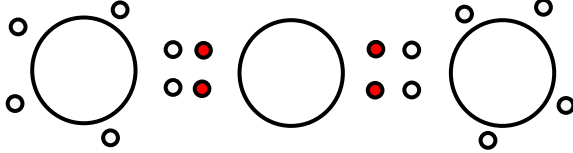
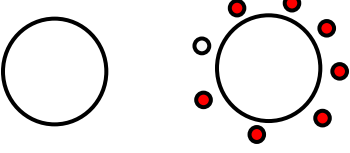
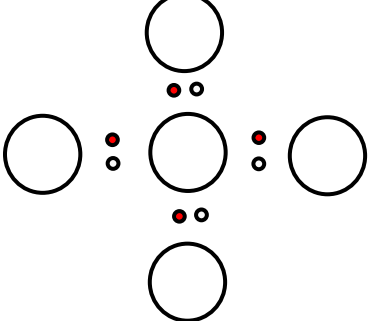
To place the positive and negative signs for the ionic bonds copy and paste: **- +**

Example:



**Hint:** Determine number of valence electrons for each chemical element listed above.

NaCl Sodium Chloride

 <p>Name _____ Bond: _____</p>	 <p>Name _____ Bond: _____</p>
 <p>Name _____ Bond: _____</p>	 <p>Name _____ Bond: _____</p>
 <p>Name _____ Bond: _____</p>	 <p>Name _____ Bond: _____</p>



**Part E:** Data analysis (Use litmus test results when making the lists.)

1. List any acids that are non-conductors
2. List any acids that are conductors
3. List any acids that have an ionic bond
4. List any acids that have a covalent bond
5. List any bases that are non-conductors
6. List any bases that are conductors
7. List any base that has an ionic bond
8. List any base that has a covalent bond

For part **D** (Bonds): Do your results support your hypothesis? Explain your results.

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For part **E** (Acids and Bases): Do your results support your hypothesis? Explain your results.

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