

Name: \_\_\_\_\_

Period: \_\_\_\_\_

Seat#: \_\_\_\_\_

**Directions:**

***ATTACH BINDER PAPER TO THE BACK SHOWING THAT YOU ACTUALLY DREW THE STRUCTURES!!!!***

1. For each of the following molecules, determine the number of lone pairs and bonded pairs around the central atom. What is the steric number based on this?
2. Describe the structure according to the number of “regions of electron density.”  
In other words – what is the Electron Geometry?
3. Rename the shape you see based on the bonded atoms. In other words – what is the Molecular Geometry?
4. Estimate the angle between the atoms attached to the central atom.

Molecule	# of Lone Pairs	# of Bond Pairs	Steric #	Electron Geometry <small>(the “generic” one that includes lone pairs)</small>	Molecular Geometry <small>(the “specific” one based on the atoms. If in doubt, always give Molec. Geo!)</small>	Angle between bonds
BeCl <sub>2</sub>						
CH <sub>4</sub>						
NH <sub>3</sub>						
H <sub>2</sub> O						
PCl <sub>5</sub>						
BF <sub>3</sub>						
PBr <sub>3</sub>						
SI <sub>2</sub>						
SF <sub>6</sub>						
HCN						

**Directions:** Fill out the following chart. For your examples of molecules and polyatomic ions, please only choose from the following:

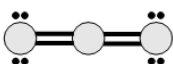
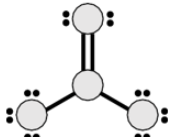
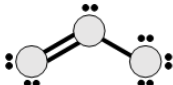
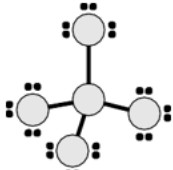
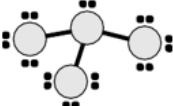

<b>CO<sub>2</sub></b>	<b>ClF<sub>3</sub></b>	<b>PF<sub>3</sub></b>	<b>SF<sub>2</sub></b>	<b>SO<sub>2</sub></b>	<b>XeF<sub>2</sub></b>
<b>CF<sub>4</sub></b>	<b>ClF<sub>5</sub></b>	<b>PF<sub>5</sub></b>	<b>SF<sub>4</sub></b>	<b>SO<sub>3</sub></b>	<b>XeF<sub>4</sub></b>
			<b>SF<sub>6</sub></b>		

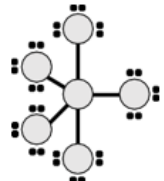
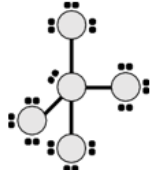
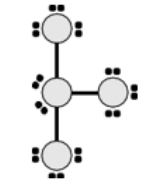
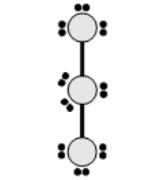
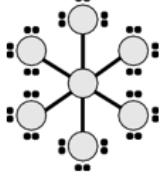
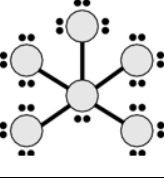
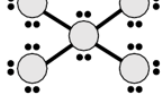
<b>Br<sub>3</sub><sup>-</sup></b>	<b>ClO<sub>2</sub><sup>-</sup></b>	<b>NO<sub>2</sub><sup>+</sup></b>	<b>PF<sub>4</sub><sup>-</sup></b>	<b>SO<sub>4</sub><sup>2-</sup></b>
	<b>ClO<sub>3</sub><sup>-</sup></b>	<b>NO<sub>2</sub><sup>-</sup></b>	<b>PF<sub>6</sub><sup>-</sup></b>	<b>SF<sub>5</sub><sup>+</sup></b>
	<b>ClF<sub>4</sub><sup>-</sup></b>	<b>NO<sub>3</sub><sup>-</sup></b>		

Bonding Domains around central atom	Nonbonding Domains around central atom	Total # e-Domains around central atom	Electron Domain Geometry	Molecular Geometry	Example of a Molecule	Example of Polyatomic Ion	Total Number of Valence Electrons
2	0	2	linear				
3	0	3	trigonal planar				
2	1	3	trigonal planar				
4	0	4	tetrahedral				
3	1	4	tetrahedral				
2	2	4	tetrahedral				
5	0	5	trigonal bipyramidal				
4	1	5	trigonal bipyramidal				
3	2	5	trigonal bipyramidal			N/A	
2	3	5	trigonal bipyramidal				
6	0	6	octahedral				
5	1	6	octahedral			N/A	
4	2	6	octahedral				


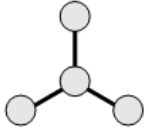
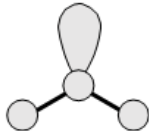
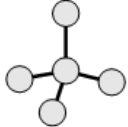
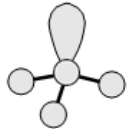
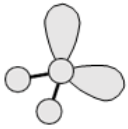
**Directions:** Determine the total number of valence electrons for each molecule or polyatomic ion below.

Formula	# Valence e-
CO <sub>2</sub>	
CF <sub>4</sub>	
ClF <sub>3</sub>	
ClF <sub>5</sub>	
PF <sub>3</sub>	
PF <sub>5</sub>	
SF <sub>2</sub>	
SF <sub>4</sub>	
SF <sub>6</sub>	
SO <sub>2</sub>	
SO <sub>3</sub>	
XeF <sub>2</sub>	
XeF <sub>4</sub>	
Br <sub>3</sub> <sup>-</sup>	
ClO <sub>2</sub> <sup>-</sup>	
ClO <sub>3</sub> <sup>-</sup>	
ClF <sub>4</sub> <sup>-</sup>	
NO <sub>2</sub> <sup>+</sup>	
NO <sub>2</sub> <sup>-</sup>	
NO <sub>3</sub> <sup>-</sup>	
PF <sub>4</sub> <sup>-</sup>	
PF <sub>6</sub> <sup>-</sup>	
SO <sub>4</sub> <sup>2-</sup>	
SF <sub>5</sub> <sup>+</sup>	

Lewis Structure	# Valence e-
	
	
	
	
	
	

Lewis Structure	# Valence e-
	
	
	
	
	
	
	

**Directions:** Identify the number of bonding and nonbonding domains around the central atom, and identify the name of the molecular geometry shape.

Molecule	# of Bonding Domains around central atom	# of Nonbonding Domains around central atom	Name of Molecular Geometry shape
			
			
			
			
			
			

Molecule	# of Bonding Domains around central atom	# of Nonbonding Domains around central atom	Name of Molecular Geometry shape
