Name: _____ Period: _____ Assigned on Tuesday, February 03, 2026

5.1 Lab: Molecular Geometry **Due Wednesday, February 04, 2026**

Objectives

- Construct a series of compounds, using the VSEPR model.
- Relate each constructed model to the electron-dot model.
- Describe and name the molecular geometry of each model.

Procedure

1. For each substance, draw the Lewis dot structure and determine the number of lone pairs and bond pairs around the central atom.

2. Build a model for each compound or ion, using a plain toothpick to represent the lone pairs and a toothpick and small styrofoam balls to represent each pair bonded to an atom.

3. Fill in the required information on the data table for each substance.

Data

Use the data table on the back of this page to record your data.

Conclusion Questions (Answer after doing the lab!)

1. What effect does the presence of lone-pair electrons have on the bond angles in a molecule?

_____

2. How is "VSEPR" used to predict the arrangement of the electron pairs about the central atom?

_____

3. Why are electron-dot diagrams limited in representing the geometry of a molecule? Explain and give an example.

_____

4. What is meant by the term "polar bond"?

_____

5. What is meant by the term "polar molecule"?

_____

6. The molecule carbon tetrafluoride (CF_4) contains very polar covalent bonds, yet the molecule as a whole is nonpolar. Explain using the shape of the molecule and symmetry.

_____

_____

7. Which molecule would be more polar, hydrogen chloride or hydrogen bromide? Explain.

_____

_____

Form A

Molecule's Formula	Dot Structure	# of Lone Pairs on Central Atom	# of Bonded Atoms to Central Atom	Electron Pair Geometry Name	Molecular Geometry Name	Angle Between Bonds	Are Bonds Polar or Non-Polar?	Is Molecule Polar or Non-Polar?	Fuller's Stamp of Approval
H_2O									
CF_4									
AsF_5									
CO_2									
BH_3									
H_2S									
SF_6									
$BeBr_2$									
PH_3									
HCN									
NH_4^+									
H_2CO									
SF_2									

Form B

Molecule's Formula	Dot Structure	# of Lone Pairs on Central Atom	# of Bonded Atoms to Central Atom	Electron Pair Geometry	Molecular Geometry Name	Angle Between Bonds	Are Bonds Polar or Non-Polar?	Is Molecule Polar or Non-Polar?	Fuller's Stamp of Approval
SiF_4									
H_2SiO									
NH_3									
CO_2									
H_2O									
BH_3									
PH_4^+									
AsF_5									
$BeBr_2$									
HSiP									
H_2S									
SF_6									
SF_2									