

## Student directions *Molecule Shapes 1*: Introduction

**Learning Goals:** Students will be able to:

- Identify substances to which “Molecular geometry” applies.
- Name molecule and electron geometries for basic molecules.
- Explain the model being used to predict molecule geometry.
- Predict common molecular geometry from the number of electron pairs and bonded atoms around a central atom of basic compounds.

**Directions:** In these directions, “attached groups” include lone pairs, single, double, or triple bonds.

1. Identify substances to which “Molecular geometry” applies
2. Explain –
  - a. What seems to be the basic model for how groups are arranged?
  - b. What appears to be the major differences between “lone pairs” and the other items that can be attached to the central atom?
  - c. What is the main difference between the Molecular Geometry and the Electron Geometry?
3. Explore what molecules you can build. Then, read the questions below and design one table to organize your discoveries.
  - a. What are the combinations of attached groups atoms or lone pairs you can add to a central atom?
  - b. How does the number of groups help define the Electron geometry and the Molecular Geometry?
  - c. What are the names of the different geometric shapes?
  - d. What affects the bond angles?
4. Draw Lewis Dot Diagram and then the pictures that would show what the following molecules would look like, identify the Electron and Molecular Geometries, and label the approximate bond angles. (Remember the central atom is first in the formula)
  - a. HF
  - b. ClF
  - c. H<sub>2</sub>S
  - d. PF<sub>3</sub>
  - e. CO<sub>2</sub>
  - f. CH<sub>2</sub>O (oxygen is double bonded to C)
  - g. N<sub>2</sub>