

NAME: \_\_\_\_\_

DATE: \_\_\_\_\_

*Molecular Shapes* Part 1 at [phet.colorado.edu](http://phet.colorado.edu).

**Exploratory Lab (10 points)**

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

- ❖ Identify substances to which “Molecular geometry” applies.
- ❖ Name molecule and electron geometries for basic molecules.

**Directions:**

Step 1: Go to <http://phet.colorado.edu/en/simulation/molecule-shapes>.

Step 2: Run the simulator.

Step 3: Check “Molecule Geometry” and “Electron Geometry”.

Step 4: Create the molecules listed below by adding and removing single-bonded atoms and electron clouds.

Complete the table.

| Single Bond | Lone Pairs | Molecule Geometry | Electron Geometry | Bond Angle | Sketch |
|-------------|------------|-------------------|-------------------|------------|--------|
| 0           | 1          |                   |                   |            |        |
| 0           | 2          |                   |                   |            |        |
| 0           | 3          |                   |                   |            |        |
| 0           | 4          |                   |                   |            |        |
| 0           | 5          |                   |                   |            |        |
| 0           | 6          |                   |                   |            |        |

| Single Bond | Lone Pairs | Molecule Geometry | Electron Geometry | Bond Angle | Sketch |
|-------------|------------|-------------------|-------------------|------------|--------|
| 1           | 0          |                   |                   |            |        |
| 1           | 1          |                   |                   |            |        |
| 1           | 2          |                   |                   |            |        |
| 1           | 3          |                   |                   |            |        |
| 1           | 4          |                   |                   |            |        |
| 1           | 5          |                   |                   |            |        |
| 2           | 0          |                   |                   |            |        |
| 2           | 1          |                   |                   |            |        |
| 2           | 2          |                   |                   |            |        |
| 2           | 3          |                   |                   |            |        |
| 2           | 4          |                   |                   |            |        |

| Single Bond | Lone Pairs | Molecule Geometry | Electron Geometry | Bond Angle | Sketch |
|-------------|------------|-------------------|-------------------|------------|--------|
| 3           | 0          |                   |                   |            |        |
| 3           | 1          |                   |                   |            |        |
| 3           | 2          |                   |                   |            |        |
| 3           | 3          |                   |                   |            |        |
| 4           | 0          |                   |                   |            |        |
| 4           | 1          |                   |                   |            |        |
| 4           | 2          |                   |                   |            |        |
| 5           | 0          |                   |                   |            |        |
| 5           | 1          |                   |                   |            |        |
| 6           | 0          |                   |                   |            |        |

### Post-Lab Questions

What is the difference between “Molecule Geometry” and “Electron Geometry”?

What general patterns exist for identifying the Molecule Geometry of a molecule?

What general patterns exist for identifying the Electron Geometry of a molecule?