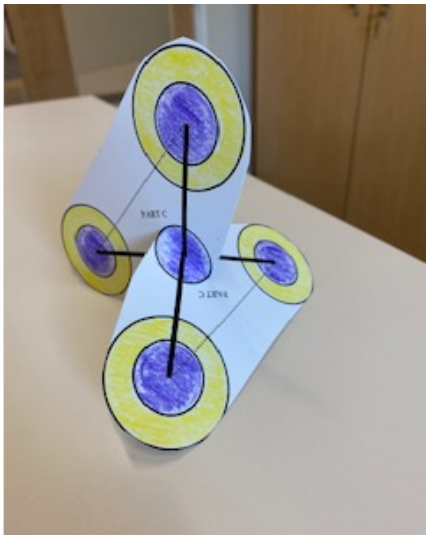
# VSEPR Flat Packs: An Economic Model Kit

*Kathryn Rust, chemedx.org, June 2023*

Molecular geometry is a center-piece to a student's understanding of intermolecular forces. Unfortunately, many students don't have the special skills to "see" the geometry without a model kit. We use a model kit in our laboratories, but there are not enough of them nor are there funds to purchase more. The students are unable to use these during there study time. It would be helpful for students to have access to a model kit while they are studying.

I have created a VSEPR flat pack. This is an inexpensive paper model kit that students can use at home and personalize to indicate different types of atoms and electron domains. It is easily assembles/ disassembled for storage in a flat envelope.



**Concepts:** VSEPR, molecular geometry, molecular polarity, molecular shape

**Time required:** 10-20 minutes to cut-out More time if personalization is desired.

**Materials:**

Printout of flat pack on copy paper or cardstock.
Scissors
Colored pencils, markers or crayons

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Procedure:

1. Print out pages of the flat pack on copy paper or card stock.

   *There are 2 pages for the minimum model set covering linear, trigonal planar, tetrahedral, trigonal pyramidal and octahedral geometries.*

   *More can be printed out to distinguish between different molecular geometries in and electron domain geometry.*

   *These can be enlarged and affixed to foam core for a classroom set.*

2. Color the circles

   a. Large circles= lone electron pairs
   b. Smaller circle= atoms

3. Cut out the flat pack

   a. Simple straight lines
      i. Cut along dotted lines
      ii. Informal cuts around the atoms. *This is a quick representation.*
      iii. Cut around circles indicating atoms/ electron pairs *(best representation*)
   b. Cut slits

4. Assemble by connecting along the slits.

For application:

1. Draw electron dot diagram for the compound
2. Determine number of electron domains around the central atom.
3. Choose the geometry that matches the electron domains.
4. Determine molecular geometry

   - Look at atoms in same structure
   - Look at lone electron pairs (different color, large circles)

5. Determine polarity based on geometry.

*Look at the atom (same circles) arrangement.*

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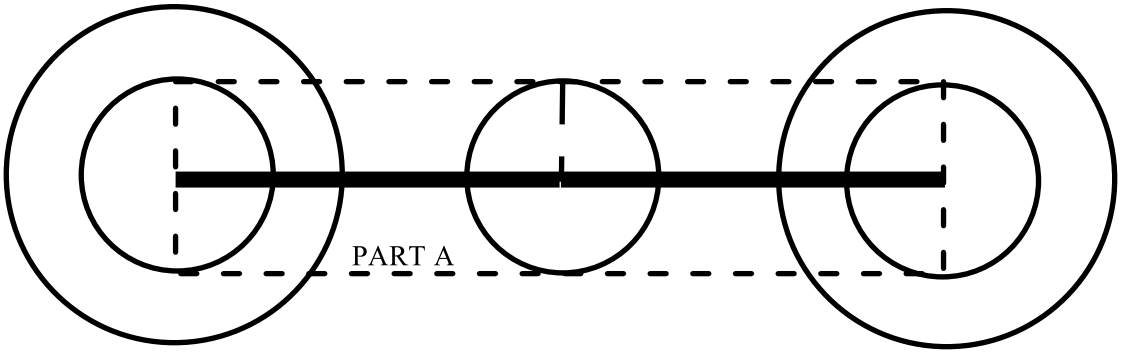


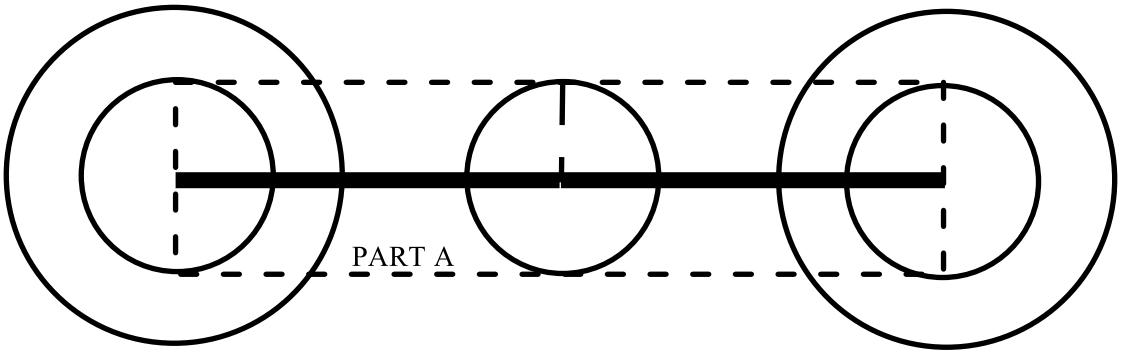

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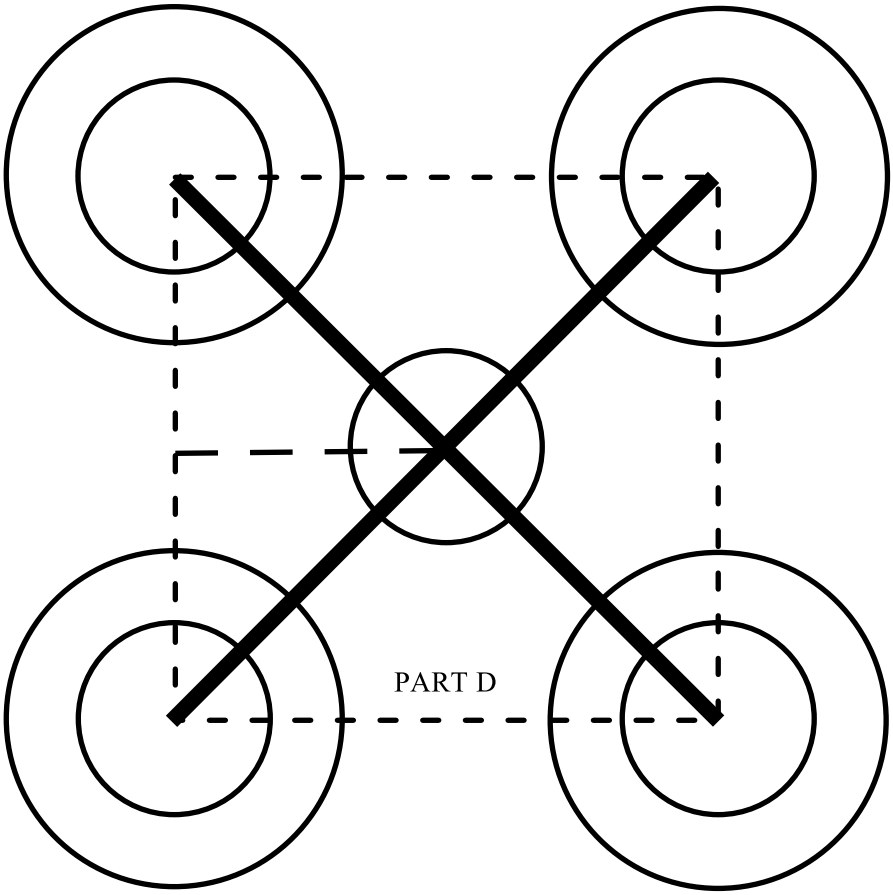

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