LESSON 37 ACTIVITY

Two's Company
Electron Domains

Name _____

Date _____ Period _____

Purpose

To use three-dimensional models to visualize small molecules.

Materials

- gumdrops, marshmallows, and toothpicks
- ruler
- ball-and-stick molecular model set

Part 1: Gumdrop Methane, CH_4

1. Create a methane molecule using gumdrops, marshmallows, and toothpicks.
2. Make sure every pair of electrons in the molecule is as far away as possible from every other pair of electrons. Use a ruler to check the distances.
3. Show your model to your teacher before proceeding.
4. Draw a picture of your final product.

Part 2: Other Gumdrop Molecules

1. Draw Lewis dot structures for these molecules:
   a. CH_4 **b.** NH_3 **c.** H_2O

2. How many pairs of electrons are located around the central atom of each molecule?

3. Besides the identity of the central atom, what is different about these three molecules?

4. Using gumdrops and toothpicks, create ball-and-stick models of NH_3 and H_2O.
5. Did you remember to include lone pairs in your models? How could you represent lone pairs?

6. If you need to, fix your models so that lone pairs are represented. Do the lone pairs have an effect on the shape of your molecule?

7. Compare your three gumdrop models. Describe any similarities.

Part 3: Ball-and-Stick Models

1. Work with your group. Use the ball-and-stick model set to create models of CH_4, NH_3, H_2O, and HF and draw them below. (Use black for carbon, white for hydrogen, and red for the other atoms.) Include the appropriate lone pair paddles in each model.

2. What do the models of these molecules have in common?

3. How many lone pair paddles would you need for an atom of neon? Explain your answer.

4. What is the shape of each molecule if you ignore the lone pair paddles?

5. **Making Sense** Explain how the lone pairs affect the shapes of these molecules.