

## Pre-Activity Quiz

1. Consider a molecule of carbon monoxide (C  $\equiv$  O):
  - A. Do you think the electrons in the triple bond pull closer to the C atom or the O atom, or are they equally shared? Use the concept of electronegativity to explain your response.
  - B. Is the bond polar or non-polar?
2. In today's engineering challenge, you will sketch out Lewis dot diagrams for various molecules and polyatomic ions. Then you will construct each molecule using a molecular model kit. The kits contain three different representations: colored balls, short sticks and long flexible springs.
  - A. Each colored ball corresponds to a different atom. How can you determine which color to use for each atom?
  - B. For what bond type do you think the short sticks are used?
  - C. If you were to build a triple bond, what would you use to represent a triple bond and how many would you use?
3. You will become familiar with different geometries of simple molecules.
  - A. Name the theory used to predict molecular shapes of these molecules?

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- B. What if a molecule contains a central atom bonded to two identical outer atoms with the central atom surrounded by a lone pair of electrons? Name the geometry of this molecule. List the bond angles in this particular molecule.
- C. What if a molecule contains a central atom bonded to four identical outer atoms without any lone-pair electrons on the central atom? Name the geometry of this molecule. List the bond angles in this particular molecule.
4. What are the advantages of constructing a 3D molecular model compared to a ball-and-stick model?
5. How does the VSEPR theory help to identify the overall geometry of a molecule?
6. How do unshared electron pairs affect a molecule's bond angles?