

Model Screen

In this screen students can build models of molecules by adding single, double, or triple bonded atoms to a central atom.

MOVE atoms or rotate the molecule to see the effect on molecule shape.

ADD or remove atoms to see effect on shape.

SHOW or hide molecule geometry.

SHOW or hide bond angles.

Real Molecules Screen

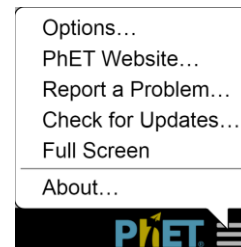
Students can investigate the molecular geometry and bond angles of a selected list of real molecules.

SELECT real molecule to view.

- BeCl₂
- BF₃
- CH₄
- PCl₅
- SF₆

Complex Controls

- The play screen can be changed to a white background to facilitate projecting the simulation. To access this feature, select Options under the PhET tool bar menu.



Model Simplifications

- The Valence Shell Electron Pair Repulsion (VSEPR) model was used to determine molecule shape for a given number of electron domains.
- When using the Model screen, students investigate the role of bonded atoms in determining molecule shape. The role of lone electron pairs can be investigated using the Molecule Shapes sim.
- On the Model screen, bond angles displayed are those predicted by the basic geometry using the VSEPR model.
- While the sim prevents students from adding more than six electron domains to the central atom, it is possible to have coordination numbers larger than six.
- Students can build non-physical structures in the Model screen. As the goals of the sim are to support students making sense of trends in molecule geometry, the building of non-physical structures is allowed to the extent that the learning goals are supported.

Suggestions for Use

Sample Challenge Prompts

- How many different molecule shapes can you make using the simulation?
- Build a molecule that has a trigonal pyramidal molecule geometry.
- Are there cases where atoms are as far apart as possible but the angles between atoms are not the same? What shapes are these, and why might this happen?

See all activities for Molecule Shapes:Basics [here](#).

For more tips on using PhET sims with your students, see [Tips for Using PhET](#).