

Simulator Procedure

1. Refer to the Molecular Structures panel on the right for the molecules to be constructed.
2. Drag the required atoms from the Atoms panel at the bottom into the workspace.
3. Place the atoms close to one another to form chemical bonds.
4. Observe the molecular formula, molecule name, and VSEPR geometry displayed after the molecule is formed.
5. Repeat the process for all molecules listed in the Molecular Structures panel to complete the simulation.

Observation:

No. of Bonding Pairs	No. of Lone Pairs	Arrangement of Electron Pairs	Shape (Molecular Geometry)	Molecule / Ion Example
1	0	Linear	Linear	H ₂
1	0	Linear	Linear	HCl
2	0	Linear	Linear	O ₂
2	0	Linear	Linear	CO ₂
3	0	Trigonal planar	Trigonal planar	BF ₃
3	0	Trigonal planar	Trigonal planar	AlCl ₃
4	0	Tetrahedral	Tetrahedral	CH ₄
4	0	Tetrahedral	Tetrahedral	CF ₄
5	0	Trigonal bipyramidal	Trigonal bipyramidal	PCl ₅
6	0	Octahedral	Octahedral	SF ₆
2	1	Trigonal planar	Bent / Angular	SO ₂
3	1	Tetrahedral	Trigonal pyramidal	NH ₃
2	2	Tetrahedral	Bent / V-shaped	H ₂ O
4	1	Trigonal bipyramidal	See-saw	SF ₄
3	2	Trigonal bipyramidal	T-shaped	ClF ₃
2	3	Trigonal bipyramidal	Linear	XeF ₂
5	1	Octahedral	Square pyramidal	BrF ₅
4	2	Octahedral	Square planar	XeF ₄

Result and Discussion

Different molecules were successfully constructed using the virtual simulator. The observed molecular geometries matched the predictions of VSEPR theory, demonstrating that electron pairs arrange themselves to minimize repulsion and achieve stable molecular shapes.