

VSEPR Theory: The 3-dimensional arrangement of atoms around any central atom is determined primarily by the repulsions between electrons in the valence shell of the atom.

General Formula	Lewis Structure	Atoms Bonded to Central Atom (X)	Unbonded Electron Pairs (Lone Pairs, E)	Hybridization and Electron Arrangement	Example	Molecular Shape	
						Name	Diagram
AX_2	$X - A - X$	2	0	sp Linear	BeH_2	Linear	$H - Be - H$
AX_3				sp^2	BH_3		
AX_2E				sp^2	SO_2		
AX_4				sp^3	CH_4		
AX_3E				sp^3	NH_3		
AX_2E_2				sp^3	H_2O		
AXE_3				sp^3	HCl		

General Formula	Lewis Structure	Atoms Bonded to Central Atom (X)	Unbonded Electron Pairs (Lone Pairs, E)	Hybridization and Electron Arrangement	Example	Molecular Shape	
						Name	Diagram
AX_5				sp^3d	PCl_5		
AX_4E				sp^3d	SF_4		
AX_3E_2				sp^3d	BrF_3		
AX_2E_3				sp^3d	XeF_2		
AX_6				sp^3d^2	SF_6		
AX_5E				sp^3d^2	BrF_5		
AX_4E_2				sp^3d^2	XeF_4		

If a molecule consists of a central atom bonded to 2 or more other atoms, the molecular shape can be predicted by:

- 1) Drawing the Lewis structure for the molecule.
- 2) Counting the number of atoms bonded and unbounded electron pairs around the central atom.
- 3) Use Valence Shell Electron Pair Repulsion Theory (VSEPR) to predict the shape.

Double and Triple Bonds and VSEPR:

Double and triple bonds can be considered as one bond when using VSEPR to predict shape.

Shape Key:

***Do not forget to include lone pairs. This key does not show them but you MUST!**

