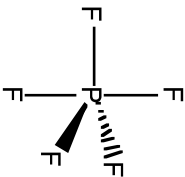
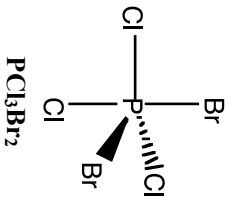
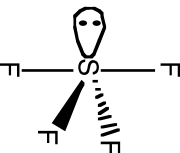
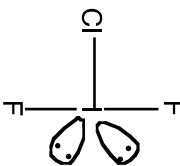
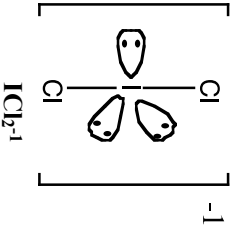
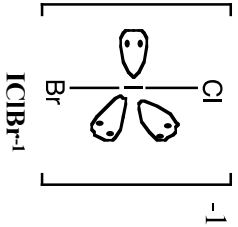
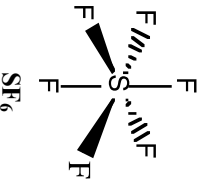
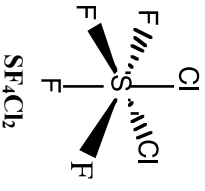


Geometry & Polarity Guide

General Structure	VSEPR / Electron Pair Geometry	Molecular / Shape Geometry	Bond Angle(s) (Degrees)	Polarity	Example
<u>Two Clouds:</u> 2 atoms, no electron pairs, <i>symmetric</i>	Linear	Linear	180	Non-polar	$\begin{array}{c} \text{:}\ddot{\text{O}}::\text{C}::\ddot{\text{O}}\text{:} \\ \text{CO}_2 \end{array}$
<u>Two Clouds:</u> 2 atoms, no electron pairs, <i>asymmetric</i>	Linear	Linear	180	Polar	$\begin{array}{c} \text{:}\ddot{\text{O}}::\text{C}::\ddot{\text{S}}\text{:} \\ \text{COS} \end{array}$
<u>Three Clouds:</u> 3 atoms no electron pairs <i>symmetric</i>	Trigonal Planar	Trigonal Planar	120	Nonpolar	$\begin{array}{c} \text{F} \text{---} \text{B} \text{---} \text{F} \\ \text{BF}_3 \end{array}$
<u>Three Clouds:</u> 3 atoms no electron pairs <i>asymmetric</i>	Trigonal Planar	Trigonal Planar	120	Polar	$\begin{array}{c} \text{:}\ddot{\text{O}}\text{:} \\ \text{H} \text{---} \text{C} \text{=}\ddot{\text{O}}\text{:} \\ \text{H}_2\text{CO} \end{array}$
<u>Three Clouds:</u> 2 atoms 1 electron pair <i>asymmetric</i>	Trigonal Planar	Bent <i>or</i> Angular	120	Polar	$\begin{array}{c} \text{:}\ddot{\text{O}}\text{:} \\ \text{O} \text{=}\ddot{\text{S}}\text{:} \\ \text{SO}_2 \end{array}$
<u>Three Clouds:</u> 1 atom, 2 electron pairs, <i>symmetric</i>	Trigonal Planar	Linear	180	Non-polar	$\begin{array}{c} \text{:}\ddot{\text{O}}::\text{O}::\ddot{\text{O}}\text{:} \\ \text{O}_2 \end{array}$
<u>Three Clouds:</u> 1 atom, 2 electron pairs, <i>asymmetric</i>	Trigonal Planar	Linear	180	Polar	$\begin{array}{c} \text{:}\ddot{\text{S}}::\text{O}::\ddot{\text{O}}\text{:} \\ \text{SO} \end{array}$

General Structure	VSEPR / Electron Pair Geometry	Molecular / Shape Geometry	Bond Angle(s) (Degrees)	Polarity	Example
<u>Four Clouds:</u> 4 atoms no electron pairs <i>symmetric</i>	Tetrahedral	Tetrahedral	109.5	Nonpolar	
<u>Four Clouds:</u> 4 atoms no electron pairs <i>asymmetric</i>	Tetrahedral	Tetrahedral	109.5	Polar	
<u>Four Clouds:</u> 3 atoms 1 electron pair <i>asymmetric</i>	Tetrahedral	Trigonal Pyramid	109.5	Polar	
<u>Four Clouds:</u> 2 atoms 2 electron pairs <i>asymmetric</i>	Tetrahedral	Bent <i>or</i> Angular	109.5	Polar	
<u>Four Clouds:</u> 1 atom 3 electron pairs <i>symmetric</i>	Tetrahedral	Linear	180	Nonpolar	
<u>Four Clouds:</u> 1 atom 3 electron pairs <i>asymmetric</i>	Tetrahedral	Linear	180	Polar	

General Structure	VSEPR / Electron Pair Geometry	Molecular / Shape Geometry	Bond Angle(s) (Degrees)	Polarity	Example
<u>Five Clouds:</u> 5 atoms no electron pairs <i>symmetric</i>	Trigonal Bipyramid	Trigonal Bipyramid	90, 120, 180	Nonpolar	 PF ₅
<u>Five Clouds:</u> 5 atoms no electron pairs <i>asymmetric</i>	Trigonal Bipyramid	Trigonal Bipyramid	90, 120, 180	Polar <i>... but can be nonpolar in certain AX₃Y₂ configurations</i>	 PCl ₃ Br ₂
<u>Five Clouds:</u> 4 atoms 1 electron pair <i>asymmetric</i>	Trigonal Bipyramid	Seesaw	90, 120, 180	Polar	 SF ₄
<u>Five Clouds:</u> 3 atoms 2 electron pairs <i>asymmetric</i>	Trigonal Bipyramid	T-shaped <i>dominant trigonal bipyramid structure with 3 atoms</i>	90, 180	Polar	 IF ₂ Cl
<u>Five Clouds:</u> 3 atoms 2 electron pairs <i>symmetric</i>	Trigonal Bipyramid	Trigonal Planar <i>rare</i>	120	Nonpolar	 BH ₃

General Structure	VSEPR / Electron Pair Geometry	Molecular / Shape Geometry	Bond Angle(s) (Degrees)	Polarity	Example
<u>Five Clouds:</u> 3 atoms 2 electron pairs <i>asymmetric</i>	Trigonal Bipyramid	Trigonal Planar <i>rare</i>	120	Polar	
<u>Five Clouds:</u> 2 atoms 3 electron pairs, <i>symmetric</i>	Trigonal Bipyramid	Linear	180	Nonpolar	
<u>Five Clouds:</u> 2 atoms 3 electron pairs <i>asymmetric</i>	Trigonal Bipyramid	Linear	180	Polar	
<u>Six Clouds:</u> 6 atoms no electron pairs <i>symmetric</i>	Octahedral	Octahedral	90, 180	Nonpolar	
<u>Six Clouds:</u> 6 atoms no electron pairs <i>asymmetric</i>	Octahedral	Octahedral	90, 180	Polar <i>...but can be nonpolar in certain AX4Y2 configurations</i>	

General Structure	VSEPR / Electron Pair Geometry	Molecular / Shape Geometry	Bond Angle(s) (Degrees)	Polarity	Example
<u>Six Clouds:</u> 5 atoms 1 electron pair <i>asymmetric</i>	Octahedral	Square Pyramid	90, 180	Polar	 IF ₅
<u>Six Clouds:</u> 4 atoms 2 electron pairs <i>symmetric</i>	Octahedral	Square Planar	90, 180	Nonpolar	 ClF ₄ ⁻¹
<u>Six Clouds:</u> 4 atoms 2 electron pairs <i>asymmetric</i>	Octahedral	Square Planar	90, 180	Polar	 ClF ₃ Br ⁻¹