


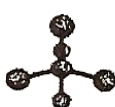











## REPRESENTATIVE VSEPR STRUCTURES

**Orbital Geometry:** describes the geometry of the orbitals, takes the nonbonding electron pairs into account because they must be in an orbital. The steric number and the hybridization will give the orbital geometry (electron-pair geometry). Therefore, there are only 5 possible orbital geometries: octahedral ( $sp^3d^2$ ), trigonal bipyramidal ( $sp^3d$ ), tetrahedral ( $sp^3$ ), trigonal planar ( $sp^2$ ) and linear ( $sp$ ).

**Molecular Geometry:** uses the nonbonding electron pairs to describe the geometry of the molecule, use AXE notation.

Steric Number	Hybridization	$AX_6$	$AX_5E$	$AX_4E_2$	
6	$sp^3d^2$	 Octahedral $90^\circ$	 Square pyramidal equatorial: $90^\circ$ axial/equatorial: $<90^\circ$	 Square planar $90^\circ$	
5	$sp^3d$	 Trigonal bipyramidal equatorial: $120^\circ$ axial/equatorial: $90^\circ$	 See-saw equatorial: $<120^\circ$ axial/equatorial: $<90^\circ$	 T-Shaped equatorial: $<120^\circ$ axial/equatorial: $<90^\circ$	 Linear $180^\circ$
4	$sp^3$	 Tetrahedral $109.5^\circ$	 Trigonal pyramidal $<109.5^\circ$	 Bent (angular) $<<109.5^\circ$	
3	$sp^2$	 Trigonal planar $120^\circ$	 Bent (angular) $<120^\circ$		
2	$sp$	 Linear $180^\circ$			

**Steps for determining geometry:** First, you must draw a correct Lewis Structure. Second, write the AXE notation. The molecular geometry will match up with the AXE notation. Third, determine the hybridization of the orbitals and the orbital geometry.