

VSEPR Theory - Molecular Geometries

# areas of electron density around the central atom			Electronic Geometry	Molecular Geometry	~Bond Angles	Examples
Total	Bonding	Lone				
2	2	0	linear	linear	180°	BeF ₂ , CO ₂
3	3	0	trigonal planar	trigonal planar	120°	BCl ₃ , CO ₃ ²⁻
3	2	1	trigonal planar	angular	120°	SnCl ₂ , SO ₂ , O ₃
4	4	0	tetrahedral	tetrahedral	109.5°	SiF ₄ , CH ₄ , NH ₄ ¹⁺
4	3	1	tetrahedral	trigonal pyramidal	109.5°	NH ₃ , ClO ₃ ¹⁻ , H ₃ O ¹⁺
4	2	2	tetrahedral	angular	109.5°	H ₂ O, OF ₂ , NH ₂ ¹⁻
5	5	0	trigonal bipyramidal	trigonal bipyramidal	90°, 120°	PCl ₅ , AsCl ₅
5	4	1	trigonal bipyramidal	seesaw	90°, 120°	SF ₄ , SeF ₄ , PF ₄ ¹⁻
5	3	2	trigonal bipyramidal	T shaped	90°	ICl ₃ , BrF ₃
5	2	3	trigonal bipyramidal	linear	180°	XeF ₂ , ICl ₂ ¹⁻
6	6	0	octahedral	octahedral	90°	SF ₆ , SiF ₆ ²⁻
6	5	1	octahedral	square pyramidal	90°	IF ₅ , SF ₅ ¹⁻
6	4	2	octahedral	square planar	90°	XeF ₄ , ClF ₄ ¹⁻