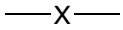
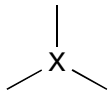
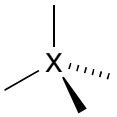
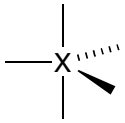
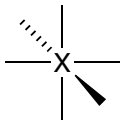
Chem 1061
Chapter 10 Notes
Fall 2004

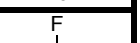
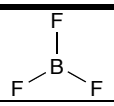
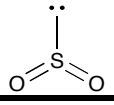
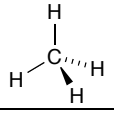
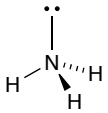
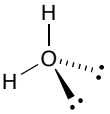
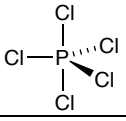
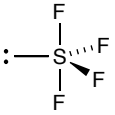
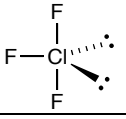
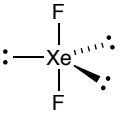
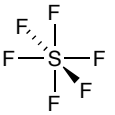
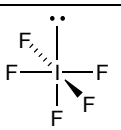
VSEPR: Valence shell electron pair repulsion principle

- Electron groups around a central atom will spread as far apart from each other as possible
- Electron groups: single bond, double bond, triple bond, or unshared (lone) pair

Electron group arrangements: depend only on number of electron groups around central atom

Number of e^- groups	**Electron group arrangement**	**Drawing**
2	Linear	
3	Trigonal planar	
4	Tetrahedral	
5	Trigonal bipyramid	
6	Octahedral	

Lone pairs take up space in an electron group arrangement just like covalent bonds would, but only the placement of atoms determines the overall molecule shape

Electron groups	Bonding groups	Nonbonding groups	Molecule shape	Example	Drawing
2	2	0	Linear	BeF_2	
3	3	0	Trigonal planar	BF_3	
	2	1	Bent	SO_2	
4	4	0	Tetrahedral	CH_4	
	3	1	Trigonal pyramid	NH_3	
	2	2	Bent	H_2O	
5	5	0	Trigonal bipyramid	PCl_5	
	4	1	Seesaw	SF_4	
	3	2	T-shaped	ClF_3	
	2	3	Linear	XeF_2	
6	6	0	Octahedral	SF_6	
	5	1	Square pyramid	IF_5	
	4	2	Square planar	XeF4