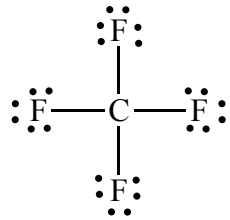
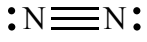
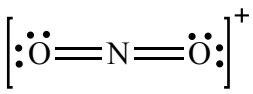
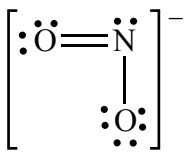
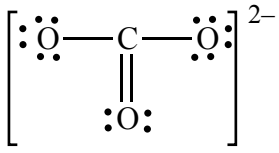
WKS
VSEPR

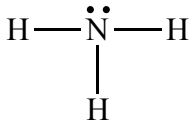
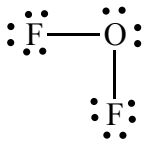
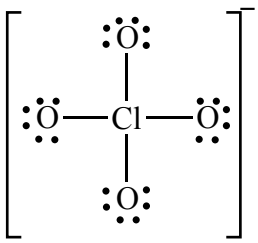
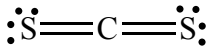
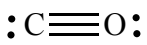
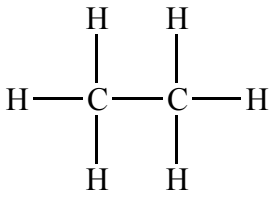
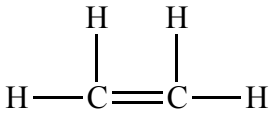
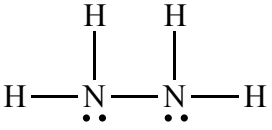
NAME _____
Period _____ **Date** _____

VSEPR Instructions

1. Start with (or determine) the Lewis Structure of the molecule.
2. Determine the number of Electron Regions
   - Any single, double or triple bond counts as a *single* region
   - Lone pairs of electrons count as a single region per pair
3. Identify the arrangement of Electron Regions (Electron Geometry)
4. From the number of lone pair regions, identify the specific Molecular Geometry
   - Molecular geometry is a subset of Electron Geometry
   - Any molecule with no lone pairs has the same Electron Geometry and Molecular Geometry
5. Draw the molecules in 3-D
   - The bond angles should be 180° (linear), 120° (trigonal planar) or 109.5° (tetrahedral)
   - You do NOT need to use the "wedges" and "hashes," but there must be NO 90° angles!
   - For lone pairs on central atom or on outer atoms with double or triple bond, draw short line at correct angle and straddle line with electron pair
   - You do not need to draw brackets or charge on the 3D drawing for polyatomic ions

For the following molecules (with Lewis Structure from the previous worksheet), indicate both the electron and molecular geometry, provide the 3D drawing, and indicate the approximate bond angle at the central atom.

Molecule	Lewis Structure	Electron Geometry	Molecular Geometry	3D Drawing	Bond Angle
1. CF_4					
2. N_2					
3. NO_2^+					
4. NO_2^-					
5. CO_3^{2-}					

Molecule	Lewis Structure	Electron Geometry	Molecular Geometry	3D Drawing	Bond Angle
6. NH_3					
7. OF_2					
8. ClO_4^-					
9. CS_2					
10. CO					
11. CN^-					
12. C_2H_6 * (H_3CCH_3)					
13. C_2H_4 * (H_2CCH_2)					
14. C_2H_2 * (HCCH)					
15. N_2H_4 * (H_2NNH_2)					

*For 12-15, both central atoms have identical geometry. Look at each C or N atom individually to determine the electron and molecular geometry.