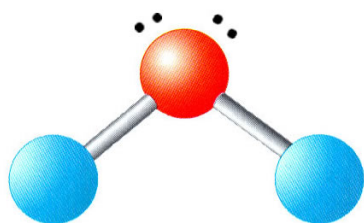


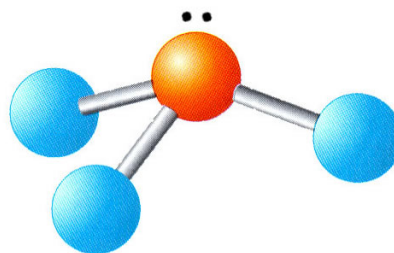
WKS
Molecular Polarity

NAME _____
Period _____ **Date** _____

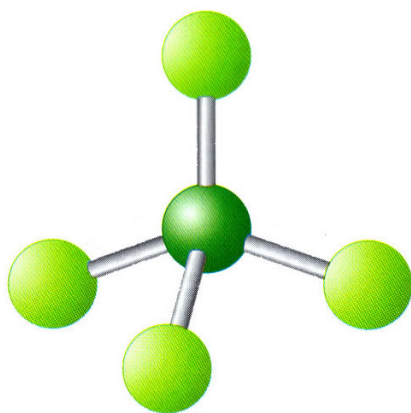
- Polar Molecule has net dipole (what is left over when we take into account all the dipoles)
1. What two properties are needed for overall molecular polarity?
 - a. At least 1 polar covalent bond
 - b. Asymmetric molecule – so the dipoles don't cancel out.
 - i. At least 1 electron region must be different (not counting double or triple bonds)
 - ii. A molecule can have very polar bonds, but still be nonpolar
 2. How is molecular polarity determined?
 - a. Determine bond polarities -
 - i. Treat each bond separately – don't add EN values!
 - ii. Draw in dipoles (using the arrow is more helpful)
 - b. Determine symmetry of molecule -
 - i. If symmetrical (all electron regions are the same) – dipoles all cancel (like tug of war)...no net dipole → nonpolar molecule
 - ii. If asymmetrical – dipoles don't cancel...net dipole → polar molecule
 - Look for lone pair(s) or a different atom!



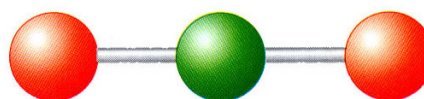
Water, H₂O



Ammonia, NH₃



Carbon tetrachloride, CCl₄



Carbon dioxide, CO₂

3. Draw the Lewis structures for the following molecules or polyatomic ions. Determine the electron and molecular geometries and draw the 3-dimensional structure. On the 3-D drawing, put a dipole arrow ($\text{+} \longrightarrow$) or the partial charges ($\delta\text{+}/\delta\text{-}$) on any polar bonds. Indicate whether the overall molecule is polar, and explain how you determined the molecular polarity (Are there any polar bonds? Is the molecule asymmetrical?).

Formula & # e ⁻	Lewis Structure (Show ALL electrons)	Electron & Molecular Geometries	3-D Drawing (show ALL dipoles)	Polar (Y/N)? Explain
(a) OF ₂				
(b) CS ₂				
(c) H ₂ CO				
(d) PF ₃				
(e) CH ₃ F				
(f) SO ₃				
(g) SCO				