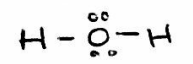
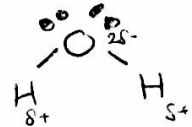
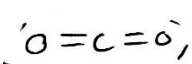
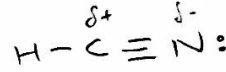
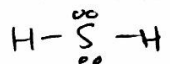

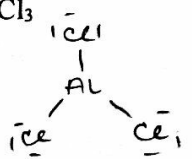

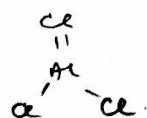


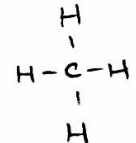
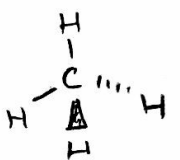
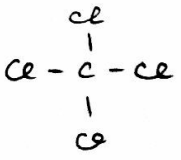
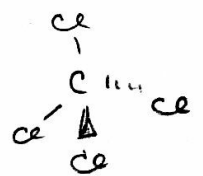
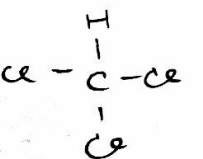
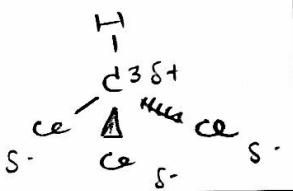
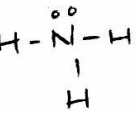
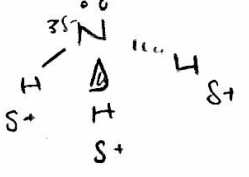
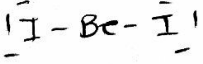
VSEPR Theory Worksheet

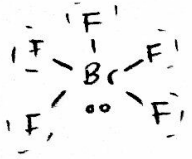
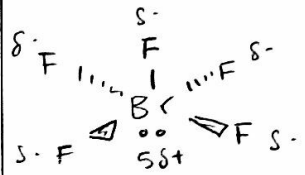
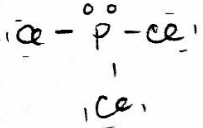
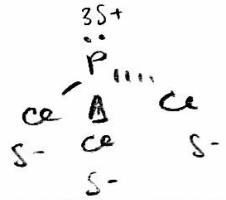
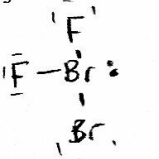
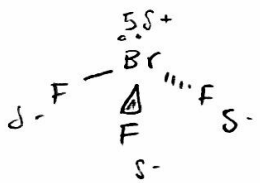
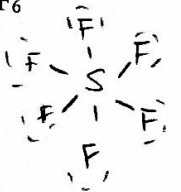

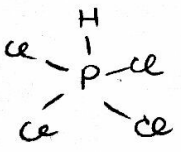
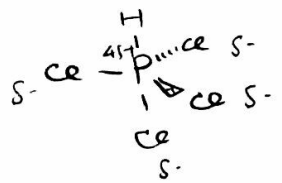
Compound, and Lewis diagram	Central atom			Electron geometry	Molecular shape	3-D diagram (show central lone pairs)	Polar bonds? (calculate)	Overall dipole?
	Bond pairs	Lone pairs	Total pairs					
1) H_2O 	2	2	4	tetrahedral	bent.		$\Delta EN = 3.44 - 2.2$ $= 1.24$ \rightarrow <u>yes</u>	<u>yes</u>
2) CO_2 	2	0	2	linear	linear	$\text{O}=\text{C}=\text{O}$	$\Delta EN = 3.44 - 2.55$ $= 0.89$ \rightarrow <u>yes</u>	no (symm.)
3) HCN $\text{H}-\text{C}\equiv\text{N}:$	2	0	2	linear	linear		$\text{H}-\text{C}$ $\Delta EN = 0.4 \rightarrow$ <u>no</u> $\text{C}-\text{N}$ $\Delta EN = 0.5 \rightarrow$ <u>yes</u>	<u>yes</u>
4) H_2S 	2	2	4	tetrahedral	bent.		$\Delta EN = 0.4 \rightarrow$ <u>no</u>	no
5) AlCl_3 	3	0	3	trig. planar	trig. planar		$\Delta EN = 1.5$ polar covalent (\approx ionic character)	no



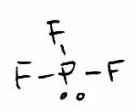

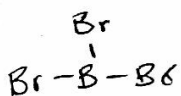
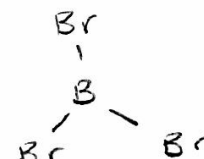
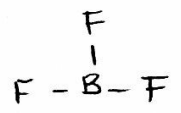

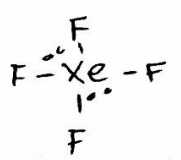
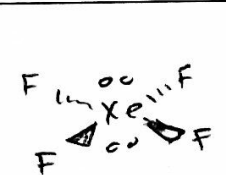
you may draw:



either way shape is the same
(no l.p.)

	Compound, and Lewis diagram	Central atom			Electron geometry	Molecular shape	3-D diagram (show central lone pairs)	Polar bonds? (calculate)	Overall dipole?
		Bond pairs	Lone pairs	Total pairs					
6)	CH_4 	4	0	4	tetrahedral	tetrahedral		$\Delta EN = 0.4 \rightarrow \text{no}$	no
7)	CCl_4 	4	0	4	tetra.	tetra.		$\Delta EN = 0.5 \rightarrow \text{yes}$	no
8)	HCCl_3 	4	0	4	tetra.	tetra.		$\text{CH} - \text{no}$ $\text{CCl} - \text{yes}$	yes
9)	NH_3 	3	1	4	tetra.	trig. pyramid		NH $\Delta EN = 0.9 \rightarrow \text{yes}$	yes
10)	BeI_2 	2	0	2	linear	linear	$\text{I}-\text{Be}-\text{I}$	$\Delta EN = 1.0$ <u>yes</u>	no

	Compound, and Lewis diagram	Central atom			Electron geometry	Molecular shape	3-D diagram (show central lone pairs)	Polar bonds? (calculate)	Overall dipole?
		Bond pairs	Lone pairs	Total pairs					
11)	BrF_5 	5	1	6	octahedral	Square pyramid		$\Delta EN = 1.2$ <u>yes</u>	yes
12)	PCl_3 	3	1	4	tetra- hedral	trig. pyramid		$\Delta EN = 0.9$ <u>yes</u>	yes
13)	BrF_3 	3	1	4	tetrahedral	trig. pyramid		$\Delta EN = 1.2$ <u>yes</u>	yes
14)	SF_6 	6	0	6	octahedral	octahedral		$\Delta EN = 1.5$ <u>yes</u>	no
15)	HPCl_4 	5	0	5	trig. bipyramid	trig. bipyramid		HP $\Delta EN = 0 \rightarrow \text{no}$ PCl $\Delta EN = 0.9 \rightarrow \text{yes}$	yes

Compound, and Lewis diagram	Central atom			Electron geometry	Molecular shape	3-D diagram (show central lone pairs)	Polar bonds? (calculate)	Overall dipole?
	Bond pairs	Lone pairs	Total pairs					
SF ₄ 	4	1	5	trig. bipyramid	see-saw		$\Delta EN = 1.5$ yes	yes
PF ₃ 	3	1	4	tetra.	trig. pyr.		$\Delta EN = 1.9$ yes	yes
BBr ₃ 	3	0	3	trig. planar	trig. planar		$\Delta EN = 0.8$ yes	no
BF ₃ 	3	0	3	trig. planar	trig. planar		$\Delta EN = 2.0$ yes	no
XeF ₄ 	4	2	6	Octahedral	sq planar		$\Delta EN = 2.6 - 4.01$ $= 1.4$ yes	no