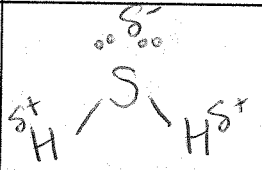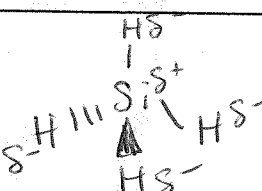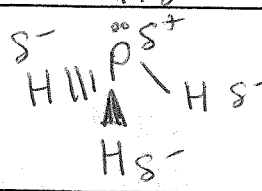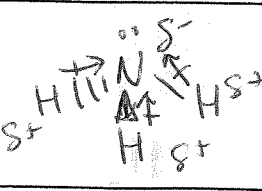Complete the chart below using the compounds listed on the left side.

Compound	Draw the Lewis Structure	3-D -using the model kits create a 3-D version of compound -Draw in below	Name of Shape -Using the 3D molecule write the name of the shape below	Calculate the ΔEN for each type of bond in molecule -draw in partial charges and vector where appropriate	Polar OR Non polar Molecule,
a) H_2 dispersion	H — H	H — H	linear	ΔEN H 2.20 H 2.20 ———— 0	non-polar
b) Cl_2 dispersion	:Cl̈ – Cl̈:	:Cl̈–Cl̈:	linear	ΔEN Cl 3.16 Cl 3.16 ———— 0	non-polar
c) H_2O H-bonding dipole-dipole dispersion	H – Ö – H	↗Ö↖ δ+H Hδ+	bent	ΔEN O 3.44 H 2.20 ———— 1.24	polar
d) H_2S dispersion	H – S̈ – H	S δ+H / \ Hδ+	bent	ΔEN S 2.58 H 2.20 ———— 0.38	non-polar
e) CS_2 dispersion	S̈ =C= S̈	δ⁻S δ+ δ⁻S S̈ =C= S̈	linear	ΔEN S 2.58 C 2.55 ———— 0.03	non-polar
f) SiH_4 dispersion	H | H –Si– H | H	Hδ Siδ+ δ⁻H| |Hδ⁻ δ⁻H Hδ⁻	tetrahedral	ΔEN H 2.20 Si 1.90 ———— 0.30	non-polar
g) PH_3 dispersion	H– P̈ –H | H	δ⁻ Pδ+ δ⁻Hⅲ \ H δ⁻ Hδ⁻	pyramidal	ΔEN H 2.20 P 2.19 ———— 0.01	non-polar
h) NH_3 H-bonding dipole-dipole dispersion	H – N̈ – H | H	N δ⁻ δ+Hⅲ \Hδ+ H δ+	pyramidal	ΔEN N 3.04 H 2.20 ———— 0.84	polar

Analysis Questions:

1. Divide the molecules in the table into 2 groups according to polarity, ie Polar and Non polar and record.

2. Define the term "Intermolecular Forces"

3. There are 2 general types of intermolecular forces
   -**Dispersion Forces**: are the only forces that exist between non polar molecules.

   Dispersion forces increase when the number of electrons that make up the molecule increases. Determine the total number of electrons for each non polar molecule and predict the molecule with the lowest boiling point and the molecule with the highest boiling point for the non polar group.

   -**Dipole-dipole Forces**: are the forces that exist between polar molecules.

   An increase in the polarity of the bond results in general, in an increase in dipole-dipole forces. Looking at the polar molecules, rank the molecules with respect to increasing boiling point.

1.

Polar	B.P	Non-polar
H_2O		H_2 (2)
NH_3		Cl_2 (14)
		H_2S (8)
		CS_2 (16)
		SiH_4 (10)
		PH_3 (8)

2. Intermolecular forces are ^attractive forces BETWEEN molecules that determine physical properties.

3. B.P
   H_2O highest (ΔEN 1.24)
   NH_3 lowest (ΔEN 0.84)

   B.P.
   CS_2 highest
   Cl_2
   SiH_4
   H_2S (ΔEN 0.38)
   PH_3 (ΔEN 0.01)
   H_2 lowest