

Question 1: How many **unpaired** electrons are present on each element below? How many bonds does each element typically form?

carbon	4 unpaired electrons, 4 bonds	boron	3 unpaired electrons, 3 bonds
oxygen	2 unpaired electrons, 2 bonds	iodine	1 unpaired electron, 1 bond
phosphorus	3 unpaired electrons, 3 bonds	nitrogen	3 unpaired electrons, 3 bonds

Question 2: Give the name for each molecule below.

CO <sub>2</sub>	carbon dioxide
CO	carbon monoxide ← not monoxide
PCl <sub>3</sub>	phosphorous trichloride
N <sub>2</sub> O <sub>4</sub>	dinitrogen tetroxide ← not tetraoxide
OBr <sub>2</sub>	oxygen dibromide

Question 3: Give the chemical formula for each molecule below.

sulfur trioxide	SO <sub>3</sub>
tetraphosphorous decoxide	P <sub>4</sub> O <sub>10</sub>
nitrogen monoxide	NO
disilicon hexabromide	Si <sub>2</sub> Br <sub>6</sub>
carbon tetrachloride	CCl <sub>4</sub>

Question 4: Give the molecular shape for each molecule below.

H <sub>2</sub> S	bent
BF <sub>3</sub>	trigonal planar
CH <sub>4</sub>	tetrahedral
NH <sub>3</sub>	trigonal pyramidal
CS <sub>2</sub>	linear

Question 5: Order each set of atoms in order of increasing electronegativity.

least boron, carbon nitrogen most

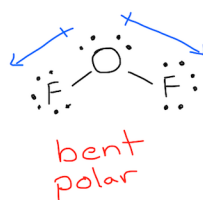
least iodine, chlorine, fluorine most

least barium, magnesium, silicon most

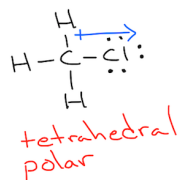
Question 6: For each molecule below,

- Draw the Lewis structure
- Give the molecular shape around each central atom
- Label all **polar** covalent bonds with their partial negative and partial positive charges
- Determine if the molecule is polar or non-polar overall

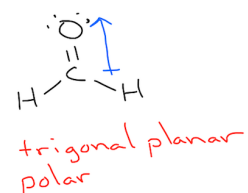
OF<sub>2</sub>



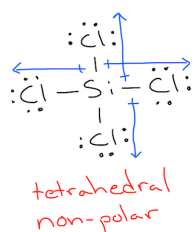
CH<sub>3</sub>Cl



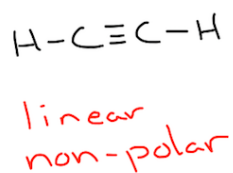
CH<sub>2</sub>O



SiCl<sub>4</sub>



C<sub>2</sub>H<sub>2</sub>



PBr<sub>3</sub>

