

Please use this as a study guide and not as a way to cheat on your lab

VSEPR

Valence Shell Electron Pair Repulsion

1. Sum of valence electrons

- Total electrons to be distributed for the Lewis structure.

2. Lewis Structure

- The goal is to distribute the electrons equally.
- Electrons want to be as far apart as possible (they repulse each other)

3. 3-D Model Sketch with ideal bond angles

- This should be what the "ball and stick" model look like.

4. Number of atoms bonded to central atom

- Count the number of atoms

5. Number of non-bonding electron pairs on the central atom

- Remember **pairs**

6. Electron geometry

- This is the geometry considering only the connections (bonds) to the atoms.

7. Molecular geometry

- This is the overall structure of the molecule.

8. Hybridization of central atom

- This is the fun part... sp , sp^2 , sp^3
- You can find this by the number of bonds to the central atom.

9. Polarity

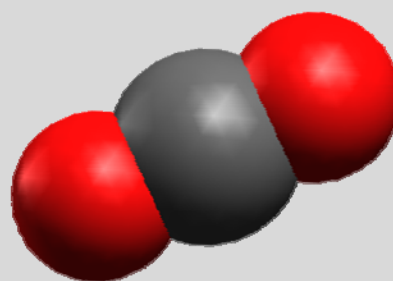
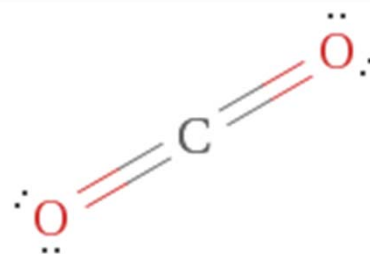
- For polar bonds, verify that the symmetry does not cancel each other out.

CO_2
 HCN
 BF_3
 SO_2
 $C_2H_3O_2^-$
 I_3^-
 CH_2ClBr
 SF_4
 $SbCl_5^{2-}$
 C_2H_2
 XeF_2
 SF_3^+
 SF_6
 BrF_3
 CO_3^{2-}
 CH_3NH_2



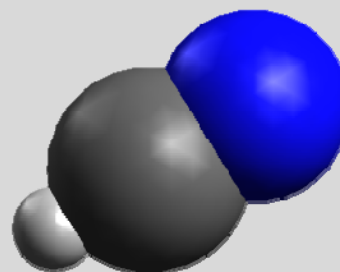
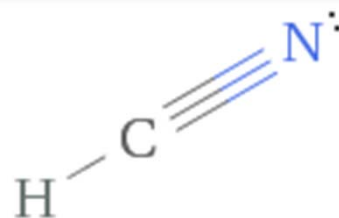
CO₂

1. Sum of valence electrons
 - 16 electrons
2. Lewis Structure
3. 3-D Model Sketch with ideal bond angles
4. Number of atoms bonded to central atom
 - Two
5. Number of non-bonding electron pairs on the central atom
 - Zero
6. Electron geometry
 - Linear
7. Molecular geometry
 - Linear
8. Hybridization of central atom
 - sp
9. Polarity
 - Non Polar



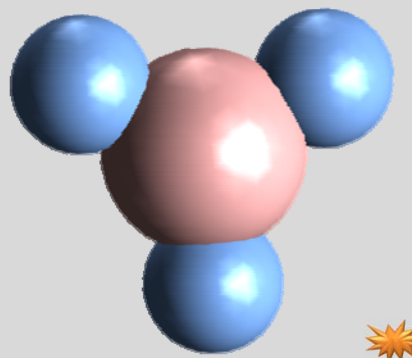
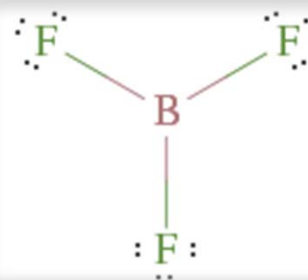
HCN

1. Sum of valence electrons
 - 10 electrons
2. Lewis Structure
3. 3-D Model Sketch with ideal bond angles
4. Number of atoms bonded to central atom
 - Two
5. Number of non-bonding electron pairs on the central atom
 - Zero
6. Electron geometry
 - Linear
7. Molecular geometry
 - Linear
8. Hybridization of central atom
 - sp
9. Polarity
 - Polar



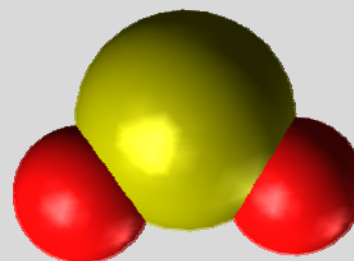
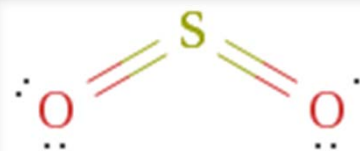
BF₃

1. Sum of valence electrons
 - 24 electrons
2. Lewis Structure
3. 3-D Model Sketch with ideal bond angles
4. Number of atoms bonded to central atom
 - Three
5. Number of non-bonding electron pairs on the central atom
 - Zero
6. Electron geometry
 - Trigonal Planer
7. Molecular geometry
 - Trigonal Planer
8. Hybridization of central atom
 - sp²
9. Polarity
 - Non Polar



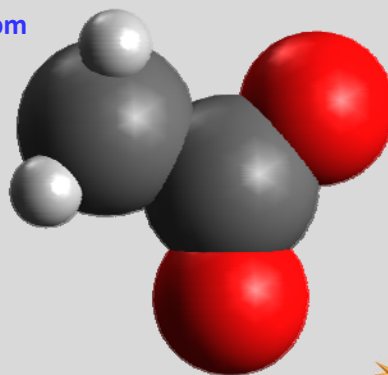
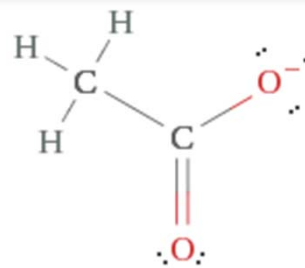
SO₂

1. Sum of valence electrons
 - 18 electrons
2. Lewis Structure
3. 3-D Model Sketch with ideal bond angles
4. Number of atoms bonded to central atom
 - Two
5. Number of non-bonding electron pairs on the central atom
 - One
6. Electron geometry
 - Trigonal Planer
7. Molecular geometry
 - Bent
8. Hybridization of central atom
 - sp²
9. Polarity
 - Polar

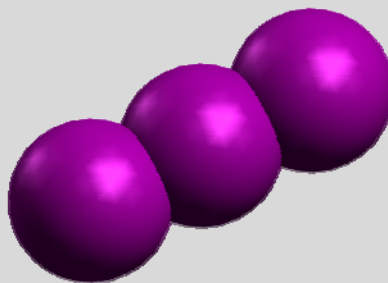




1. Sum of valence electrons
 - 28 electrons
2. Lewis Structure
3. 3-D Model Sketch with ideal bond angles
4. Number of atoms bonded to central atom
 - Four - Three
5. Number of non-bonding electron pairs on the central atom
 - Zero - Zero
6. Electron geometry
 - Tetrahedral - Trigonal Planer
7. Molecular geometry
 - Tetrahedral - Trigonal Planer
8. Hybridization of central atom
 - $\text{sp}^3 - \text{sp}^2$
9. Polarity
 - Polar

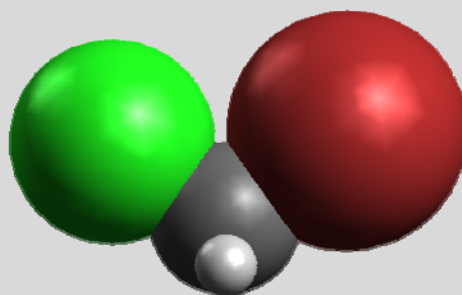
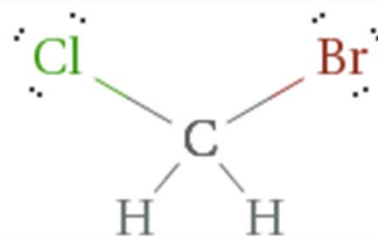


1. Sum of valence electrons
 - 22 electrons
2. Lewis Structure
3. 3-D Model Sketch with ideal bond angles
4. Number of atoms bonded to central atom
 - Two
5. Number of non-bonding electron pairs on the central atom
 - Three
6. Electron geometry
 - Trigonal Bi Pyramidal
7. Molecular geometry
 - Linear
8. Hybridization of central atom
 - sp^3d
9. Polarity
 - Non Polar



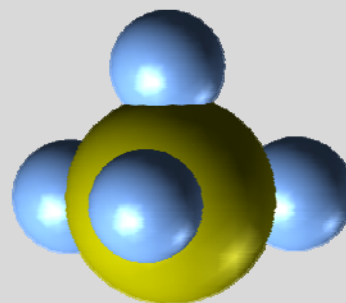
CH₂ClBr

1. Sum of valence electrons
 - 20 electrons
2. Lewis Structure
3. 3-D Model Sketch with ideal bond angles
4. Number of atoms bonded to central atom
 - Four
5. Number of non-bonding electron pairs on the central atom
 - Zero
6. Electron geometry
 - Tetrahedral
7. Molecular geometry
 - Tetrahedral
8. Hybridization of central atom
 - sp³
9. Polarity
 - Polar



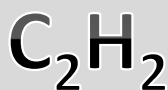
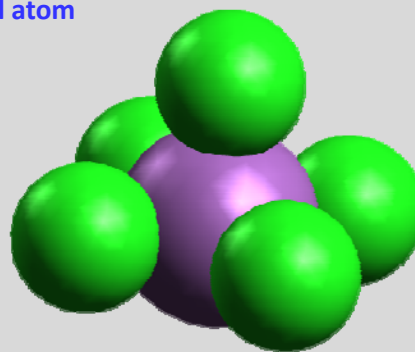
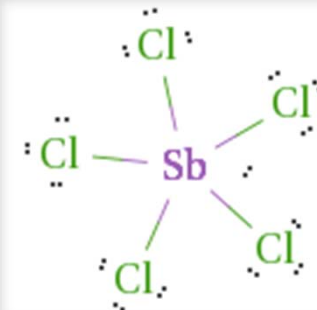
SF₄

1. Sum of valence electrons
 - 34 electrons
2. Lewis Structure
3. 3-D Model Sketch with ideal bond angles
4. Number of atoms bonded to central atom
 - Four
5. Number of non-bonding electron pairs on the central atom
 - One
6. Electron geometry
 - Trigonal Bi Pyramidal
7. Molecular geometry
 - Seesaw
8. Hybridization of central atom
 - sp³d
9. Polarity
 - Polar

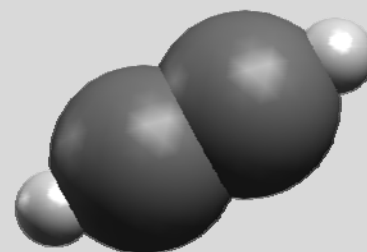
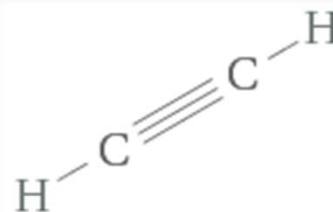




1. Sum of valence electrons
 - 42 electrons
2. Lewis Structure
3. 3-D Model Sketch with ideal bond angles
4. Number of atoms bonded to central atom
 - Five
5. Number of non-bonding electron pairs on the central atom
 - One
6. Electron geometry
 - Square Bi Pyramidal
7. Molecular geometry
 - Square Pyramidal
8. Hybridization of central atom
 - sp^3d^2
9. Polarity
 - Polar

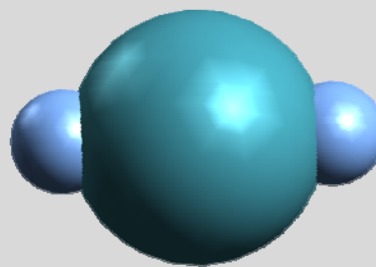
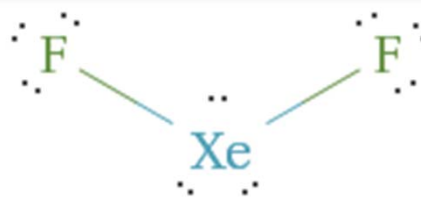


1. Sum of valence electrons
 - 10 electrons
2. Lewis Structure
3. 3-D Model Sketch with ideal bond angles
4. Number of atoms bonded to central atom
 - Two
5. Number of non-bonding electron pairs on the central atom
 - Zero
6. Electron geometry
 - Linear
7. Molecular geometry
 - Linear
8. Hybridization of central atom
 - sp
9. Polarity
 - Non Polar



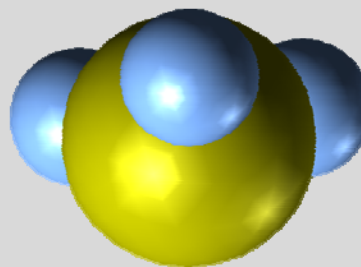
XeF₂

1. Sum of valence electrons
 - 22 Electrons
2. Lewis Structure
3. 3-D Model Sketch with ideal bond angles
4. Number of atoms bonded to central atom
 - Two
5. Number of non-bonding electron pairs on the central atom
 - Three
6. Electron geometry
 - Trigonal Bi Pyramidal
7. Molecular geometry
 - Linear
8. Hybridization of central atom
 - sp³d
9. Polarity
 - Non Polar



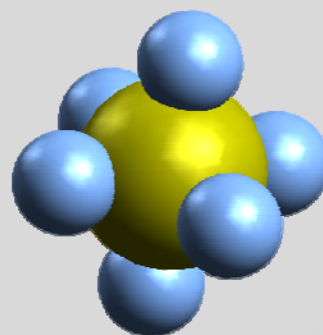
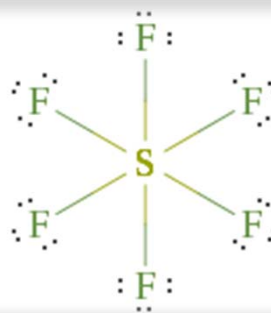
SF₃⁺

1. Sum of valence electrons
 - 26 electrons
2. Lewis Structure
3. 3-D Model Sketch with ideal bond angles
4. Number of atoms bonded to central atom
 - Three
5. Number of non-bonding electron pairs on the central atom
 - One
6. Electron geometry
 - Tetrahedral
7. Molecular geometry
 - Trigonal Pyramidal
8. Hybridization of central atom
 - sp³
9. Polarity
 - Polar



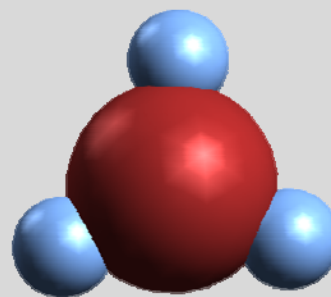
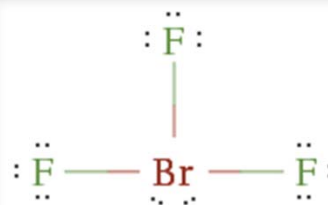
SF₆

1. Sum of valence electrons
 - 42 electrons
2. Lewis Structure
3. 3-D Model Sketch with ideal bond angles
4. Number of atoms bonded to central atom
 - Six
5. Number of non-bonding electron pairs on the central atom
 - Zero
6. Electron geometry
 - Square Bi Pyramidal
7. Molecular geometry
 - Square Bi Pyramidal
8. Hybridization of central atom
 - sp³d²
9. Polarity
 - Non Polar



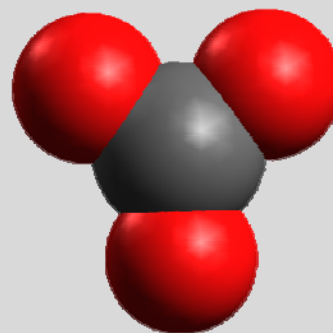
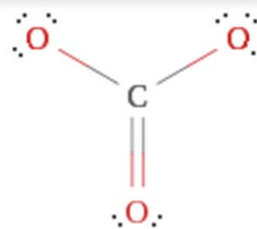
BrF₃

1. Sum of valence electrons
 - 28 electrons
2. Lewis Structure
3. 3-D Model Sketch with ideal bond angles
4. Number of atoms bonded to central atom
 - Three
5. Number of non-bonding electron pairs on the central atom
 - Two
6. Electron geometry
 - Trigonal Bi Pyramidal
7. Molecular geometry
 - Trigonal Planar
8. Hybridization of central atom
 - sp³d
9. Polarity
 - Non Polar





1. Sum of valence electrons
 - 24 electrons
2. Lewis Structure
3. 3-D Model Sketch with ideal bond angles
4. Number of atoms bonded to central atom
 - Three
5. Number of non-bonding electron pairs on the central atom
 - Zero
6. Electron geometry
 - Trigonal Planar
7. Molecular geometry
 - Trigonal Planar
8. Hybridization of central atom
 - sp^2
9. Polarity
 - Non Polar



1. Sum of valence electrons
 - 14 electrons
2. Lewis Structure
3. 3-D Model Sketch with ideal bond angles
4. Number of atoms bonded to central atom
 - Three - Four
5. Number of non-bonding electron pairs on the central atom
 - One - Zero
6. Electron geometry
 - Tetrahedral - Tetrahedral
7. Molecular geometry
 - Trigonal Pyramidal - Tetrahedral
8. Hybridization of central atom
 - sp^3 - sp^3
9. Polarity
 - Polar

