

Guaranteed successful path to a valid Lewis structure

Example: draw valid Lewis structure for CH_2O

Step 1: count how many valence electrons each atom in the molecule brings to the table!

C: 4 H: $2 \times 1=2$ O: 6 $4 + 2 + 6 = 12\text{VE}$ you only have 12VE to work with!!!!!!

Step 2: determine a central atom

- Hydrogen and fluorine can NEVER be a central atom
- Carbon is the diva of the periodic table—if carbon in compound, it is central
- If no carbon then: group 5 atoms followed by group 6, and lastly larger group 7 are the ones to chose for central. Another tip, is molecules like symmetry. For example, SO_3 , sulfur would be central—for the sake of symmetry

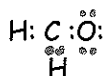
Back to our molecule, using guidelines, carbon is the central atom

Step 3: draw a skeletal structure by surrounding all other atoms around the central and only using the "bonded pairs" at this time



Step 4: make sure the periphery atoms are "happy" -hydrogen has duet and all others have octet.

- Count how many VE you have drawn in your structure.
- Does this match the number you have in step 1?



Step 5: Decision time!!!! Does the VE counted in step 4 match the VE in step 1?

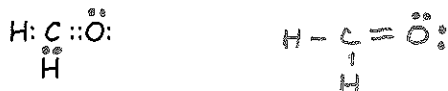
If yes, go to **step 6** if no go to **step 7**

Step 6: is your central atom happy? (have octet).

If yes—you are done!!! ☺

If no, must solve by multiple bond.

Back to our molecule: Scoot one of oxygen's lone pairs between carbon and oxygen until everyone is happy



Step 7: if you have left over, place them, as pairs, on the central atom

go to **step 6**

If you have too many, remove excess

go to **step 6**

Follow this path and you will ALWAYS get a valid Lewis structure!!!!!!

Try: CH_4 , PCl_3 , H_2O , HCN using the above steps!!