Instructions for Drawing Lewis Structures

For molecules and polyatomic ions composed of *nonmetals.*

---

1. **Count the total number of *valence* electrons.**

    *   Group number for each element = # of valence electrons.
    *   *Add* electrons for negatively charged ions.
    *   *Subtract* electrons for positively charged ions.

2. **Write the skeletal structure (the arrangement of atoms within the molecule).**

    *   Central atom = the atom with the lowest electronegativity (usually).
    *   Hydrogen is always a terminal atom (on the end).

3. **Draw a bond between the central atom and each surrounding atom.**

    *   single bond = 1 pair of electrons

4. **Place lone pairs of electrons around each *terminal* atom to complete their octets.**

    *   An octet = 4 electrons pairs around an atom (eight total electrons)
    *   Remember: hydrogen can only have 2 electrons.

5. **If there are more electrons left, place them as lone pairs on the central atom.**

    *   This will sometimes lead to an "expanded octet" around the central atom.
    *   Expanded octet = five or six electron pairs around an atom.
    *   Only central atoms from the third period and lower can have expanded octets.

6. **If the central atom has an *incomplete octet* (less than 8 electrons), use the electrons from surrounding atoms to make double or triple bonds.**

    *   Do **not** add electrons. "Borrow" them from surrounding atoms.
    *   Double bond = 2 pairs of electrons, Triple bond = 3 pairs of electrons
    *   Only C, N, O, P, and S form multiple bonds.
    *   F and Cl do **not** form multiple bonds.

7. **Sometimes you just can't complete the octet for a central atom.**

    *   If there is an ODD number of electrons, give the central atom 7 electrons instead of 8.
    *   Boron and Beryllium just don't have enough electrons to go around and often have incomplete octets.

8. **Finally, for ions, put brackets around the entire the entire Lewis structure and make sure to indicate its *charge*.**