

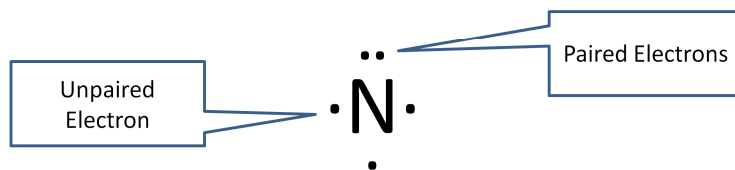
Lewis Dot Diagrams

- In chemistry, the only electrons that are actually involved in chemical activity (bonding and reactions) are the valence electrons.
- These diagrams are similar to the electron configuration diagrams you already know, but show only the valence electrons.

These are also called “Lewis structures,” “dot diagrams,” or “Lewis diagrams.” Named after Gilbert N. Lewis, these diagrams were first invented around 1915, soon after the discoveries that the atom actually had a nucleus and that the electrons moved around the outside of the nucleus. (The discoveries of electrons happened around 1907 by J.J. Thompson, and the discovery of the nucleus happened around 1913 by Ernest Rutherford.)

Drawing Lewis Dot Diagrams

- Use the chemical symbol of the element that you are drawing at the center.
- Then draw **ONLY** the valence electrons around it.



- Use the same pattern of up, down, side, side that we've done so far with electron configuration diagrams.
- After the valence shell of the atom (or ion) is half full, start to pair up the electrons, so that they are drawn either as **unpaired electrons** or **paired electrons**.
 - If the number of valence electrons is equal to or less than *half* the capacity of the valence shell, then all the electrons should be **unpaired**.
 - If the number of valence electrons is greater than half of the capacity of the valence shell, then there will be at least one set of **paired electrons**.
 - (So the total number of unpaired valence electrons is never greater than half the capacity of the valence shell.)