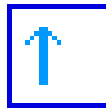


- Arrangements of electrons in the orbitals of an atom is called its electron configuration
- Writing the electron configuration one must recall how many orbitals are in each type of sublevel
- The electronic configuration for atoms can be written as  $1s^2 2s^2 2p^6$
- This is a short-hand notation which identifies the level, the sublevel and the number of electrons in the sublevel

- For example hydrogen with one electron has an electron configuration of  $1s^1$
- The orbital diagram for hydrogen can be represented in the following way

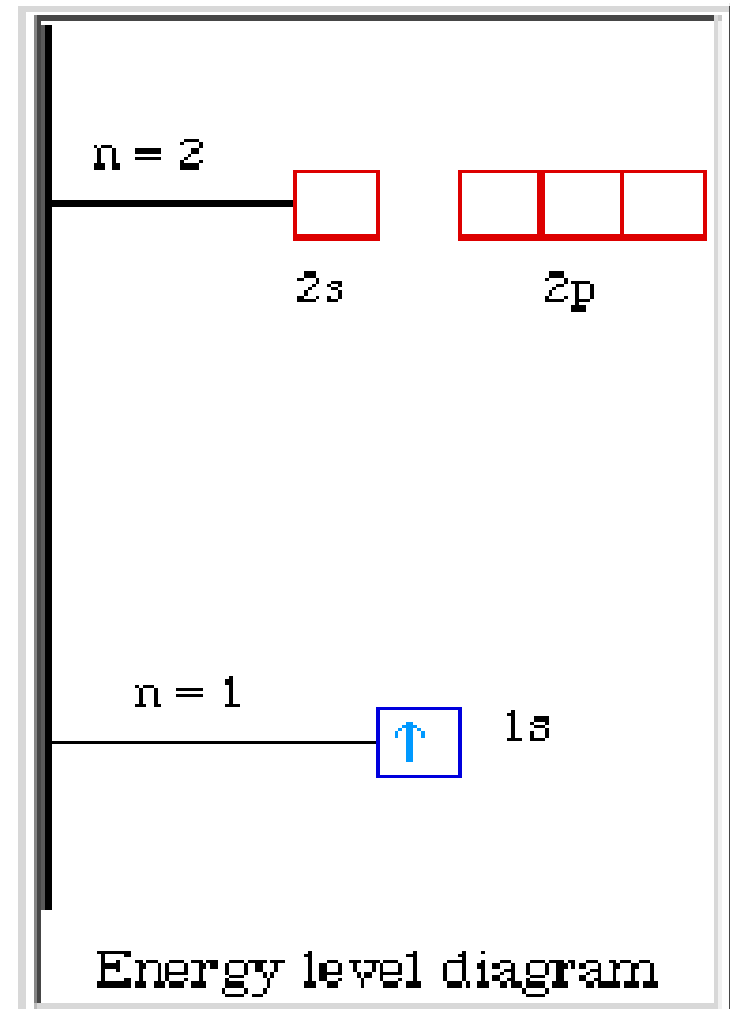


1s

Orbital diagram

- This notation uses a box to represent the orbital, the label for the orbital and an arrow to represent the electron

- We can also display the energy level diagram for the hydrogen atom



- So we have three ways to represent the electron arrangement in an atom
  - The electron configuration
  - The orbital diagram
  - and the energy diagram
- All three ways are useful

- Let us take another atom – Helium
- It has 2 electrons
- Its electron configuration will be  $1s^2$
- The orbital diagram for Helium is



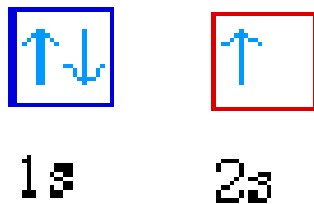
1s

Orbital diagram

- The second electron could go into the 1s orbital with the opposite spin of the first electron

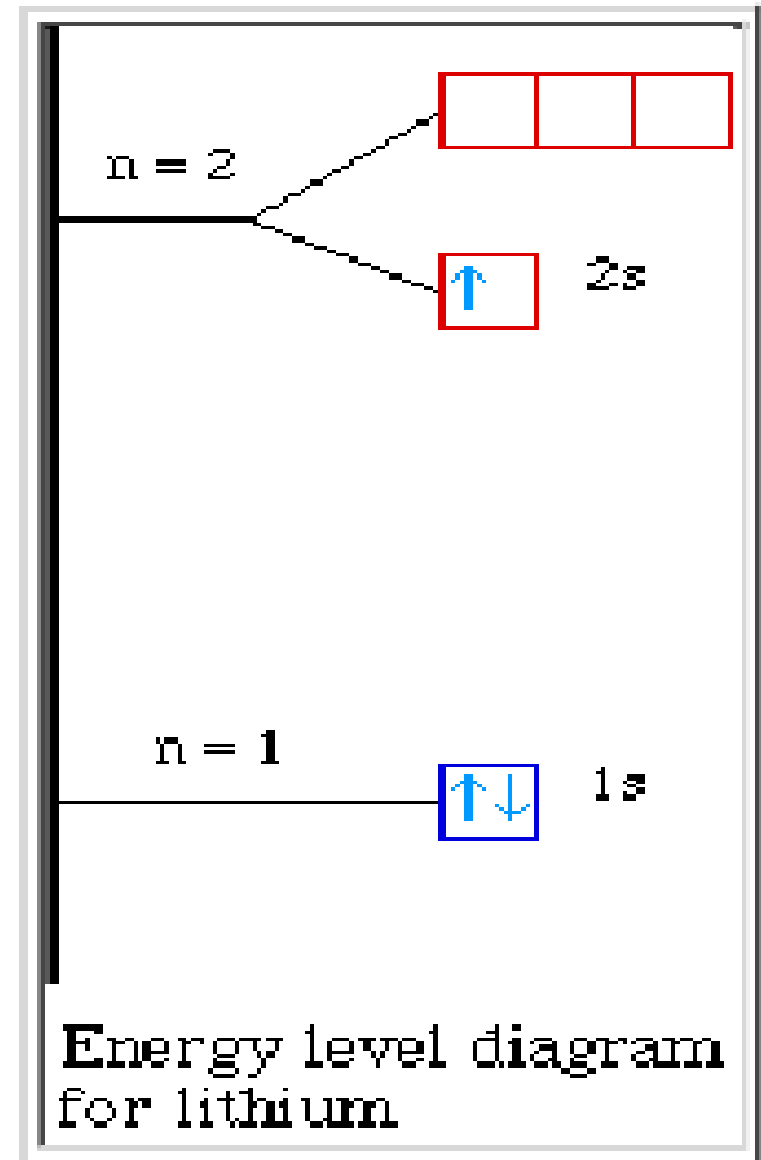
- When the third electron is to be placed it must go into the second level/shell because the first level is filled and can not accommodate any more electrons
- When the electron is added to the second level it can go into the 2s orbital or the 2p
- The Aufbau principle, states that the electrons are to be placed into the orbital of lowest energy
- 2s subshell has a lower energy than 2p subshell

- The electron configuration of Lithium will be  $1s^2 2s^1$
- Its orbital diagram is

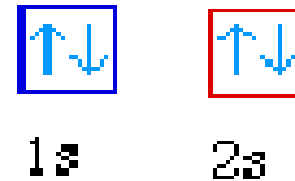


Orbital diagram

- The energy level diagram is



- Beryllium which has four electrons
- Its electron configuration will be
  - $1s^2 2s^2$
- Its orbital diagram is

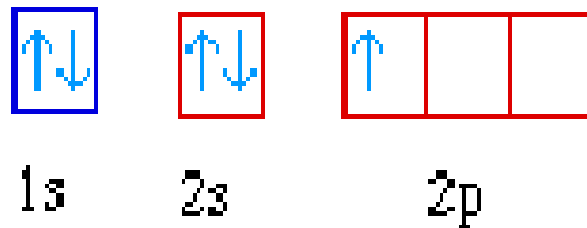


Orbital diagram

- Draw its energy level diagram



- Boron has 5 electrons
- Its electron configuration is
  - $1s^2 2s^2 2p^1$
- The orbital diagram for boron has the one electron in the 2p orbital



Orbital diagram for boron

