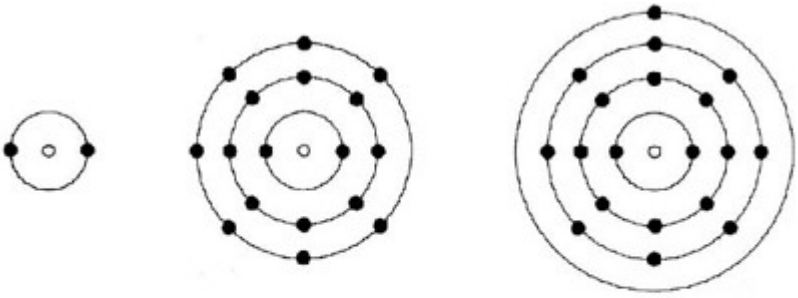
Bohr models

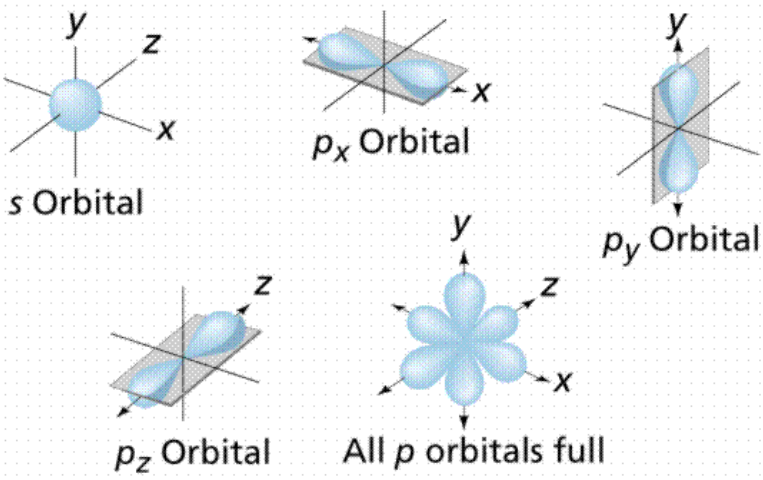
At the beginning, we learned about the "stadium seating" view of chemistry, that electrons will go down to the lowest orbital possible. This is true, but we need to learn that orbitals have different shapes and energies. We first drew all orbitals as circles. This is incomplete info, although very useful for drawing electrons. The Lewis Dot Structure is related to the Bohr model.



Helium Z = 2 | Chlorine Z = 17 | Potassium Z = 19

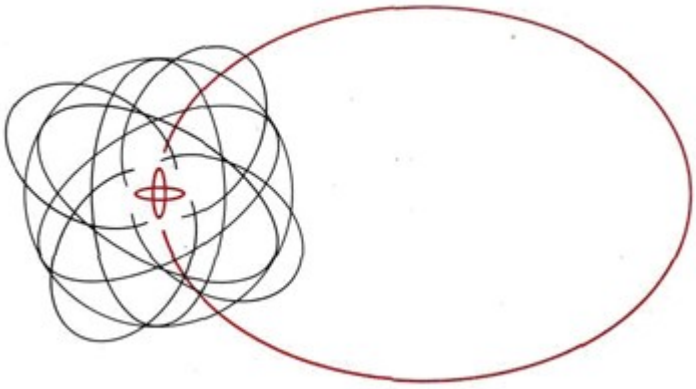
**S Orbitals**

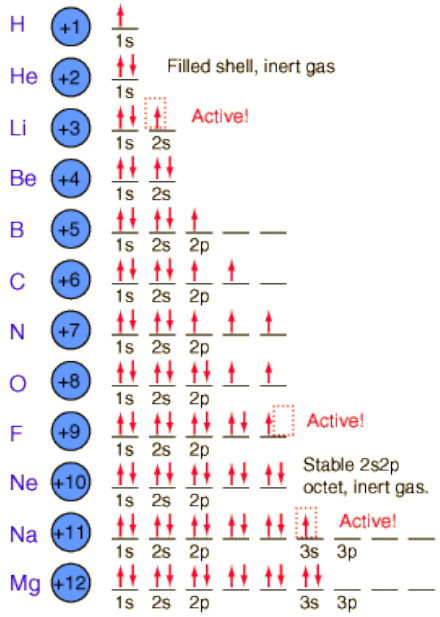
The first two electrons on the row will form a spherical orbital. The shape they occupy is described as round, like a ball. It is three dimensional. No matter which row (period) we're discussing, the first two electrons always occupy an S orbital. The S orbitals are always the first to fill. The first period has an S orbital ONLY

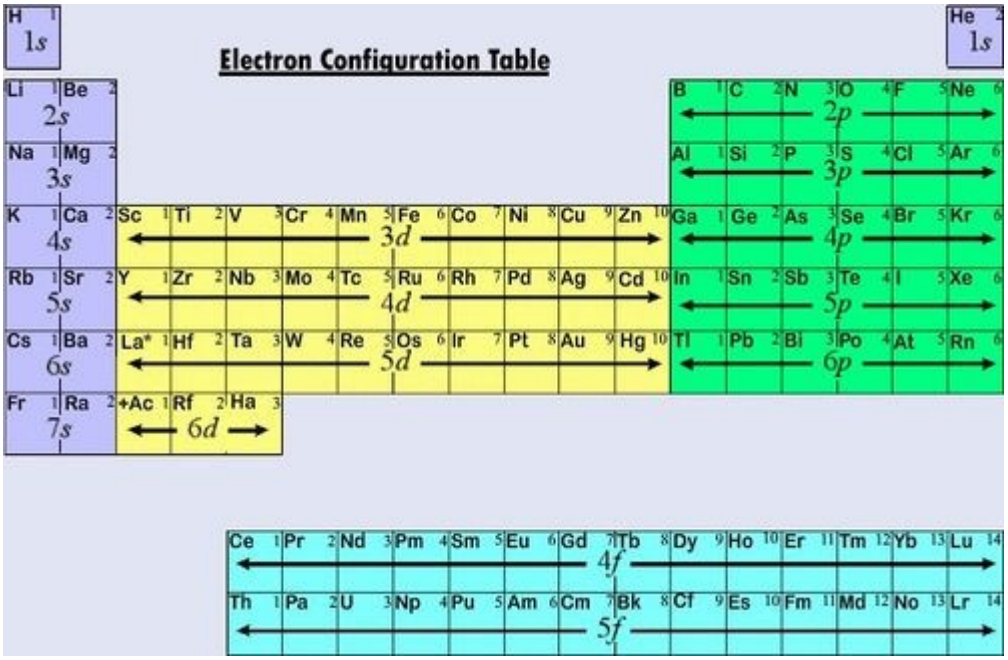


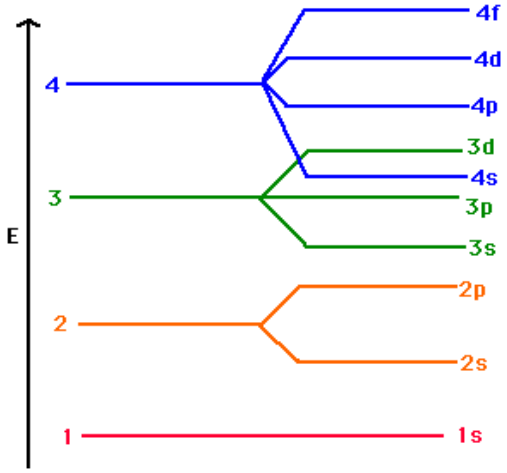

**P Orbitals**

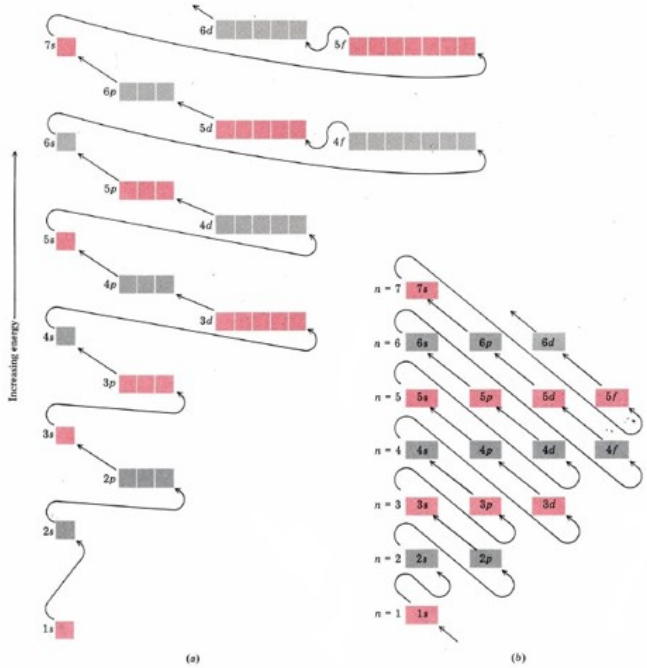
The next six electrons will go into elongated orbits. These are called P orbitals, or perpendicular. They exist on the three axis planes – the X, Y and Z axes. The reason the P orbitals can hold six electrons is that there are three options: left, right, forward, backward, up, and down.






Electron Configuration Table
H 1 1s
He 2 1s
Li 1 Be 2 2s
B 1 C 2 N 3 O 4 F 5 Ne 6 2p
Na 1 Mg 2 3s
Al 1 Si 2 P 3 S 4 Cl 5 Ar 6 3p
K 1 Ca 2 4s
Sc 1 Ti 2 V 3 Cr 4 Mn 5 Fe 6 Co 7 Ni 8 Cu 9 Zn 10 3d
Ga 1 Ge 2 As 3 Se 4 Br 5 Kr 6 4p
Rb 1 Sr 2 5s
Y 1 Zr 2 Nb 3 Mo 4 Tc 5 Ru 6 Rh 7 Pd 8 Ag 9 Cd 10 4d
In 1 Sn 2 Sb 3 Te 4 I 5 Xe 6 5p
Cs 1 Ba 2 6s
La* 1 Hf 2 Ta 3 W 4 Re 5 Os 6 Ir 7 Pt 8 Au 9 Hg 10 5d
Tl 1 Pb 2 Bi 3 Po 4 At 5 Rn 6 6p
Fr 1 Ra 2 7s
+Ac 1 Rf 2 Ha 3 6d
Ce 1 Pr 2 Nd 3 Pm 4 Sm 5 Eu 6 Gd 7 Tb 8 Dy 9 Ho 10 Er 11 Tm 12 Yb 13 Lu 14 4f
Th 1 Pa 2 U 3 Np 4 Pu 5 Am 6 Cm 7 Bk 8 Cf 9 Es 10 Fm 11 Md 12 No 13 Lr 14 5f


E
4
3
2
1
4f
4d
4p
3d
4s
3p
3s
2p
2s
1s


Increasing energy
(a)
(b)