QUANTUM MECHANICAL MODEL OF THE ATOM

In this presentation, we will look at the Quantum Mechanical model of the atom as well as explore the writing of electron configurations.

The Quantum Mechanical Model consists of: **sublevels** (represented by the letters s, p, d, and f) and **atomic orbitals.**

For each sublevel, there are a certain number of atomic orbitals where the electrons may be found.

The *s* sublevels each contain 1 orbital.
The *p* sublevels each contain 3 orbitals.
The *d* sublevels each contain 5 orbitals.
The *f* sublevels each contain 7 orbitals.

The maximum electrons that each energy level can hold can be determined by the following equation:

Total Number of Electrons per energy level = $2N^2$

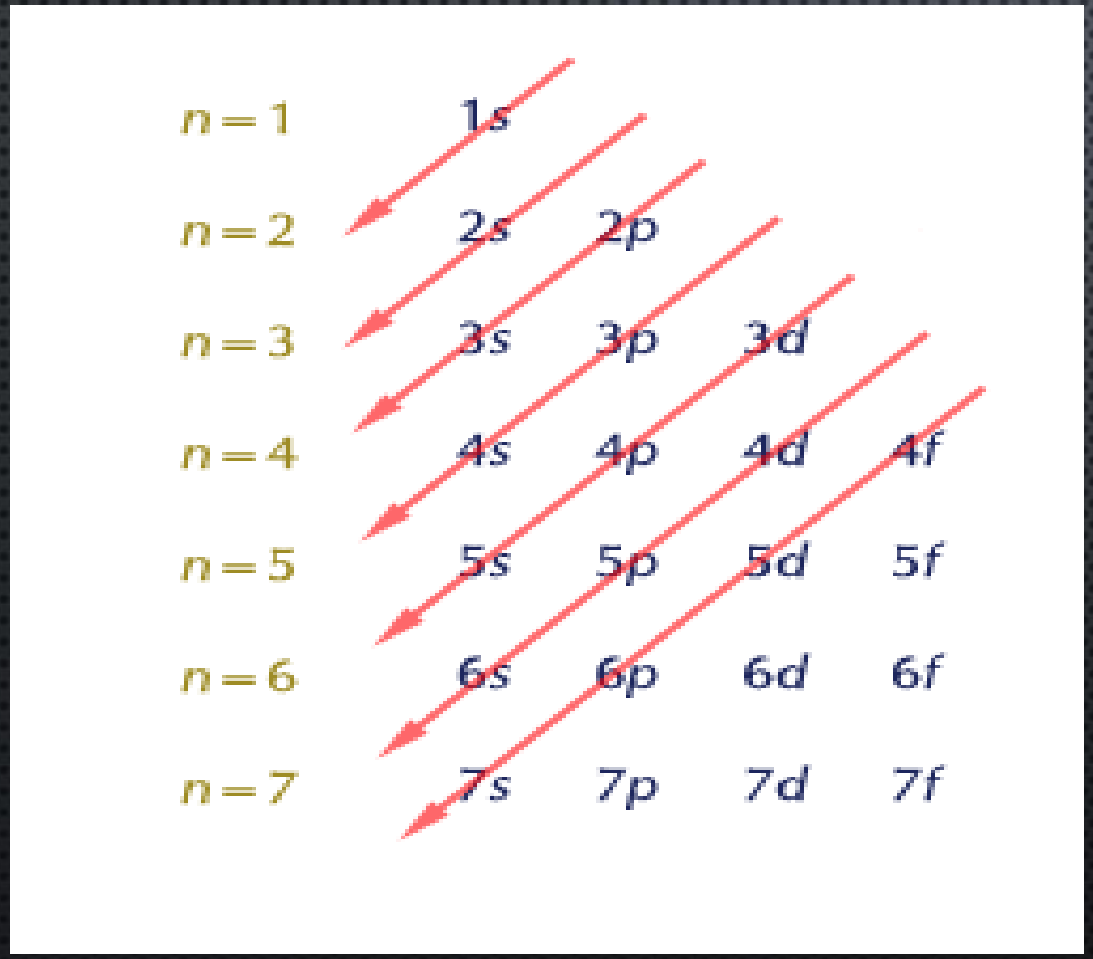
Where N is the number of the energy level

For example:

the first energy level (N = 1) can hold a maximum of 2 electrons.

The second energy level (N =2) can hold a maximum of 8 electrons.

WRITING ELECTRON CONFIGURATIONS



http://users.stlcc.edu/gkrishnan/electron3.html

(1) WRITE THE ***NUMBER*** OF THE PRINCIPAL ENERGY LEVEL (ALWAYS START AT N = 1)

(2) WRITE THE ***LETTER*** OF THE SUBLEVEL YOU ARE FILLING (S, P, D, OR F)

(3) WRITE THE NUMBER OF ELECTRONS IN THAT SUBLEVEL AS A SUPERSCRIPT.

HERE IS AN EXAMPLE.

THE ELEMENT CALCIUM HAS 20 ELECTRONS.

STARTING FROM THE LOWEST ENERGY LEVEL (1), WE WOULD WRITE THE FOLLOWING ELECTRON CONFIGURATION:

$1s^2 2s^2 2p^6 3s^2 3p^6 4s^2$

NOTICE THAT WE FILLED THE 4S SUBLEVEL **BEFORE** THE 3D SUBLEVEL.