Shells

Electrons orbit the nucleus of an atom at different ranges, called shells.
Each shell has a different energy level, increasing the further it is from the nucleus.

Each energy level is given a number called the principal quantum number, n. The closest shell has a value of n=1. The next shell has a value of n=2, etc.

The maximum number of electrons possible in the first four energy levels are:

n=	Shell	Maximum Number of Electrons
1	1st Shell	2
2	2nd Shell	8
3	3rd Shell	18
4	4th Shell	32

Using the above you can work out the maximum number of electrons that can occupy a shell is $2n^2$.
Electrons are placed into available shells, starting with the lowest energy level. Each shell must be full before the next starts to fill. This model breaks down at the n=3 shell because each shell has subshells.

Subshells

There are 4 subshells, s, p, d, and f. Each subshell can hold a different number of electrons.

SubShell	Electrons
s	2
p	6
d	10
f	14

The n number determines how many of the subshells make up the shell. For example, the 1st shell is made up of 1 subshell, *s*. It can therefore contain only 2 electrons.
The 2nd shell is made up of 2 subshells, *s* and *p*. It can therefore contain 2+6=8 electrons.

A complete table for the first four shells looks like:

Shell	Subshell	Total Number of Electrons in Shell
1st Shell	1s	2
2nd Shell	2s, 2p	2 + 6 = 8
3rd Shell	3s, 3p, 3d	2 + 6 + 10 = 18
4th Shell	4s, 4p, 4d, 4f	2 + 6 + 10 + 14 = 32

The number before each subshell specifies which shell it belongs to.
As an example, Lithium has 3 electrons. 2 will first fill up the 1st shell in subshell 1s. The remaining electron will appear in the second shell in the 2s subshell.

You can write the full electron configuration in terms of subshells.
Going back to the above example, Lithium is $1s^2 2s^1$ (1s has 2 electrons, 2s has 1 electron).

Similar electron configurations within a group of the Periodic Table can be emphasised with a simpler representation in terms of the previous noble gas.

Lithium $1s^2 2s^1$ can be simplified to [He]$2s^1$ as Helium (He) has an electron configuration of $1s^2$.