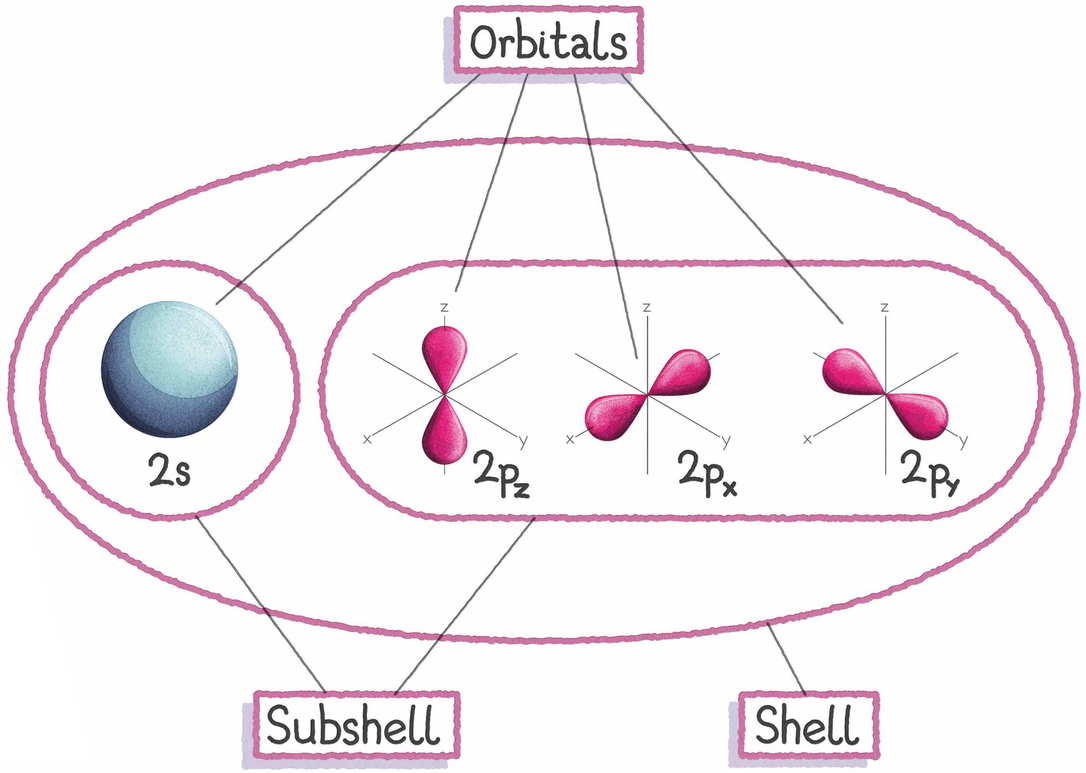
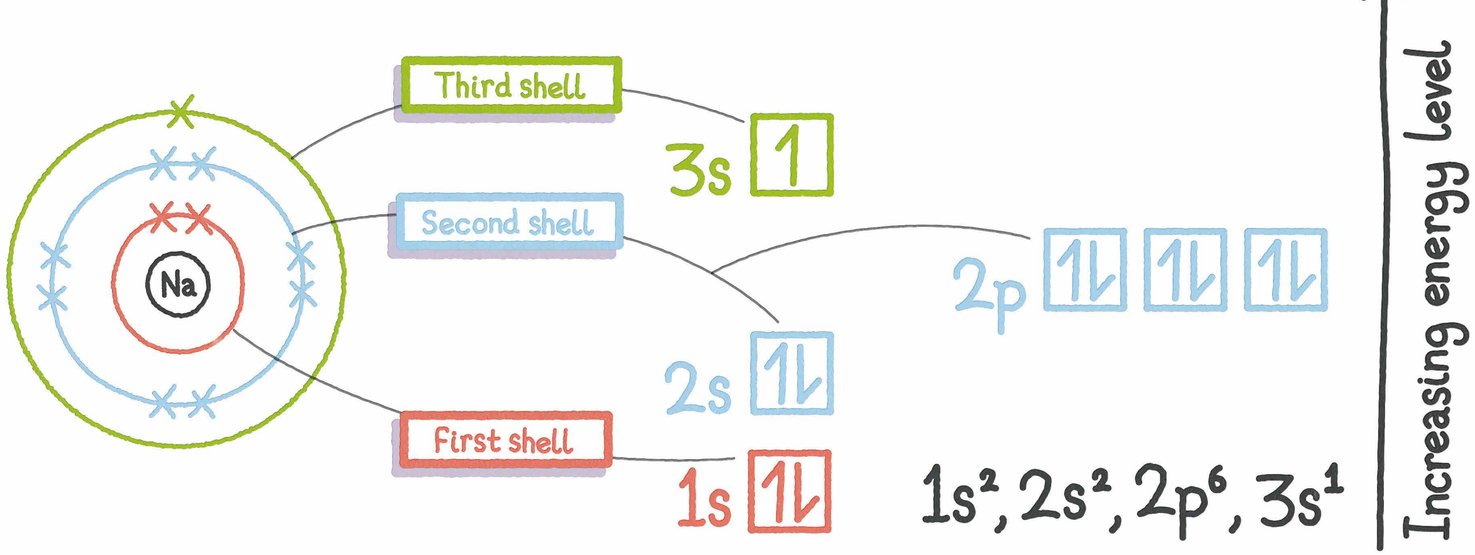
Electron configuration

We describe most chemical changes in terms of a **rearrangement of electrons**. It's therefore crucial to have an accurate understanding of the **arrangement of electrons** (the **electron configuration**) in atoms and ions. Electron configurations give us insight into the bonds that atoms are likely to form and the relative stability of ions.

Shells are the allowed **energy levels** of electrons. The **first shell** has the **lowest energy** and the energies **increase** as the electrons get **further away** from the positively charged nucleus.



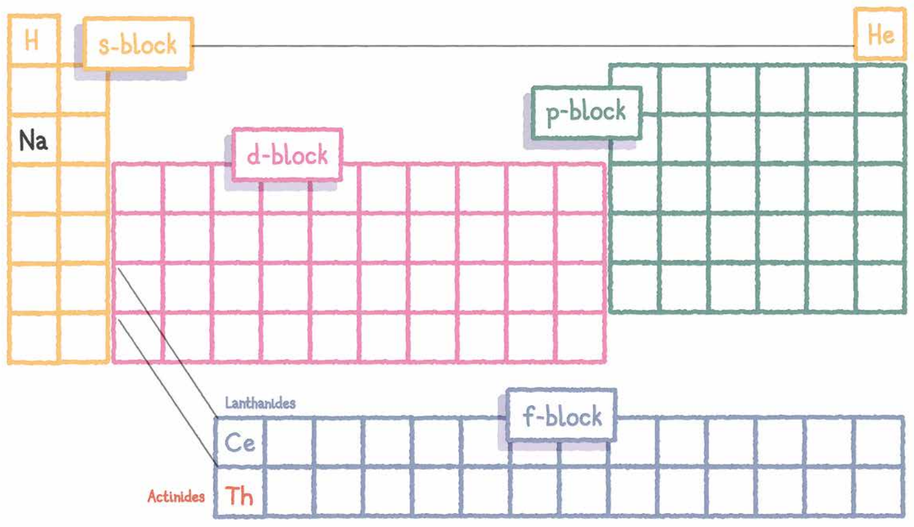
Each subshell contains different shaped **orbitals** – **regions in space** where we are likely to find electrons. Each orbital can contain just two electrons, which must have **opposite spin** from each other.



All shells are subdivided into different energy levels called **subshells**, with the exception of the first shell which is not subdivided. The second shell is divided into two subshells: **s** and **p**. The third shell is divided into three subshells: **s**, **p** and **d**.

Did you know ...?

The labels **s**, **p**, **d** and **f** come from the appearance of lines in line spectra. They stand for **sharp**, **principal**, **diffuse** and **fundamental**.



Sodium (Na) is in the **s-block** of the periodic table, which is two elements wide. The **p-block** contains elements with their highest energy electrons in the **p** subshell and is six elements wide.