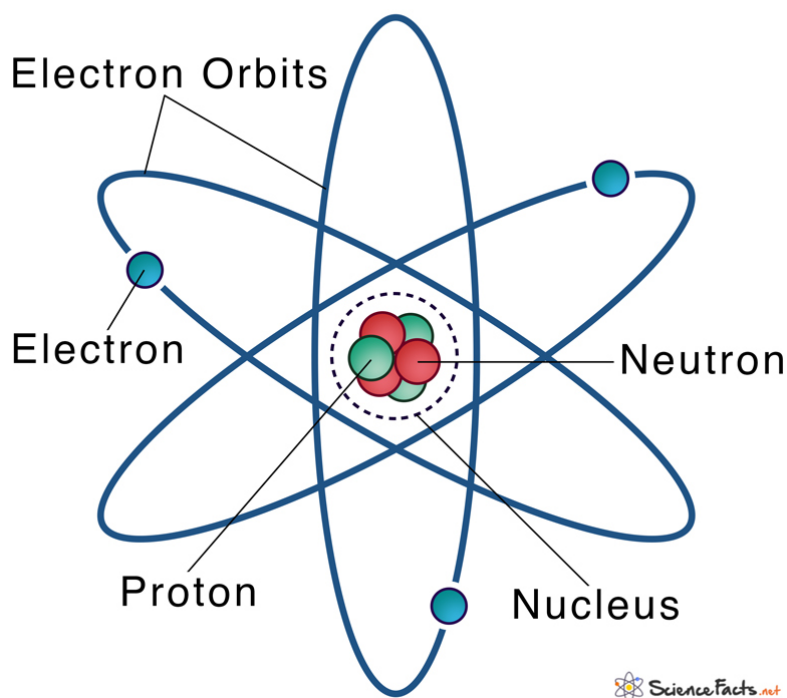


6.1 Structure of atoms and elements

Atomic Structure



Protons are positively charged.

Neutrons are neutrally charged/ they have no charge.

Electrons are negatively charged.

The 1st energy level/ electron orbit can only hold 2 electrons.

8 electrons are required in its outermost shell for the element to be stable.

For example: Neon has 8 electrons in its outermost shell meaning it is stable while oxygen has 6 electrons in its outermost shell and is chemically reactive.

Particle	Relative mass	Relative charge	Location
Proton	1836	+1	In the Nucleus
Neutron	1839	+0	In the Nucleus
Electron	1	-1	Outside the Nucleus

Nucleon number= proton+ neutrons

Mass number

Number of protons
and neutrons in atom




**Atomic symbol**

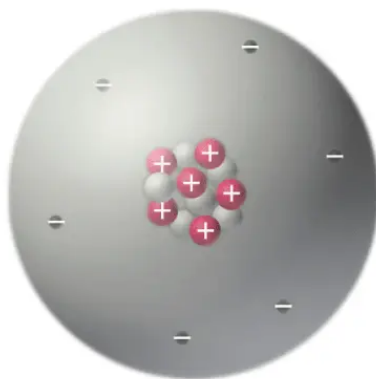
Abbreviation used
to represent atom
in chemical
formulas

Atomic number

Number of protons
in atom



6 protons 
6 neutrons 
6 electrons 

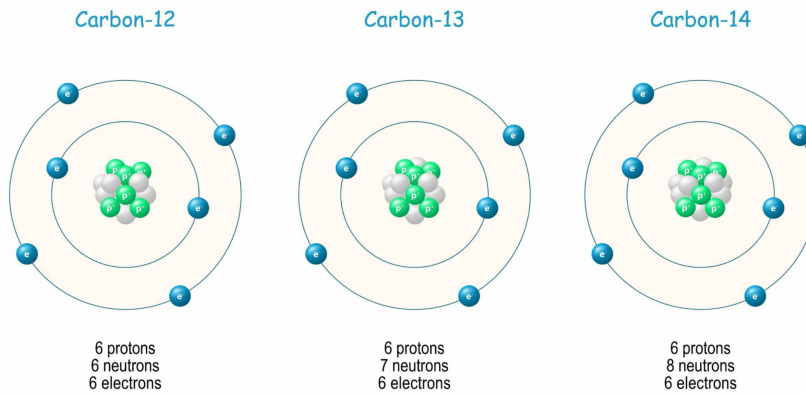
**Isotopes**

Isotopes: Atoms have the same number of protons but different numbers of neutrons and the same element.

For example:

Carbon 12, and Carbon 13

Isotopes of carbon



Credit: online-learning-college.com

Nuclear Fission

Nuclear fission is a reaction in which the nucleus of an atom splits into two or more smaller nuclei. The fission process releases a very large amount of energy.

Nuclear fusion reactions power the sun and other stars.

Two light nuclei combine to generate a single heavy nucleus.

The process releases energy because the overall mass of the resulting single nucleus is less than the mass of the two initial nuclei. The remaining mass is converted into energy.

Fusion can only occur if the reacting nuclei have enough energy to overcome their mutual electrostatic repulsion.

This can only happen if they are raised in a very high temperature (over 100million°C) so that they collide at high speeds.

Since heat is required, it is called a **thermonuclear fusion**.