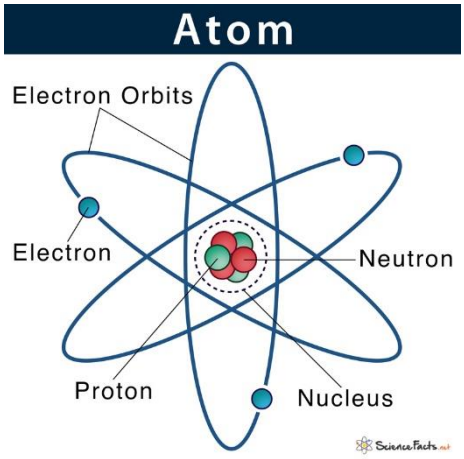
What is an Atom?

Atoms are tiny particles that form the basic building blocks of all matter in the universe, whether solid, liquid, or gas. All living organisms and nonliving objects found on Earth are made of trillions and trillions of atoms. The smaller particles that make up an atom are known as subatomic particles.

Notes:

- An atom is the smallest unit of an element, whereas a molecule consists of two or more atoms.
- When an atom loses an electron, it becomes a positive ion.



All atoms except hydrogen contain three basic subatomic particles: **1) electrons, 2) protons, and neutrons.** Neutrons and protons are found at the center of the atom within a dense region called the nucleus. In contrast, electrons are found outside the nucleus in a region called the electron cloud or electron shell.

1) Electrons

They are negatively charged particles that revolve around the nucleus in a fixed orbit. Unlike protons and neutrons, electrons are fundamental particles much smaller (almost 1800 times) in size than protons and neutrons. The standard symbol used for an electron is e or e–.

Electrons move so fast around the nucleus that their exact location within an atom cannot be determined with accuracy. When the number of negatively charged electrons is equal to the number of positively charged protons, the atom is neutral in charge.

2) Protons

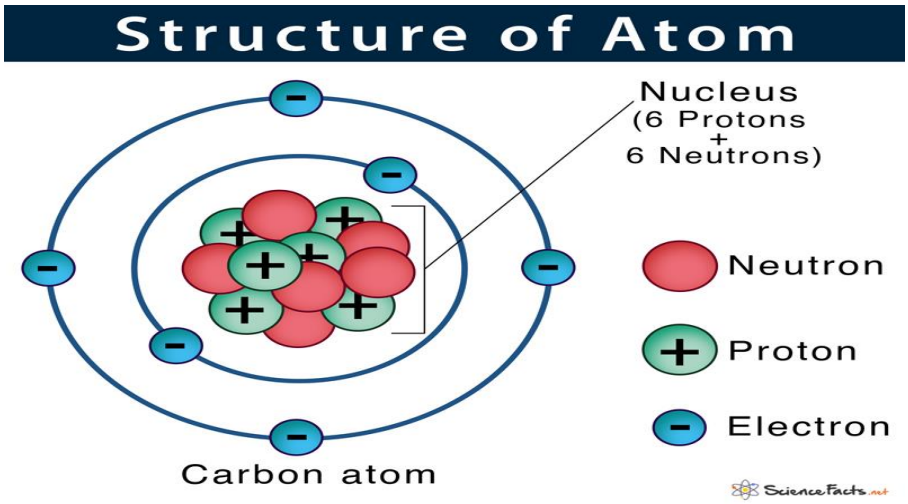
Protons are positively charged particles found within a dense region at the center of the atom called the nucleus. They were discovered by Ernest Rutherford in the year 1917 and are denoted by the symbol **p or p+.** Protons consist of even smaller particles called quarks and gluons.

Found tightly packed with the nucleus, they make up virtually all of the mass of an atom, along with the neutrons

3) Neutrons

They are also found within the nucleus along with the protons in a tightly packed manner. Neutrons, similar to protons, are made of quarks and gluons. They were discovered by James Chadwick in the year 1932 and are denoted by the symbol **n or n0**.

Neutrons are neutral particles with no charge but have a substantial size and mass similar to a proton.



Given below is a table showing the charge, mass, and location of the three sub-atomic particles:

Name of the Particle	Symbol	Relative Charge	Location in the Atom
1. Proton	p/p^+	+1	Nucleus
2. Neutron	n/n^0	0	Nucleus
3. Electron	e/e^-	-1	Shell or Orbit