

# ATOMS

## Key Revision Facts: GCSE Science

All matter is made from Atoms. The critical atom related words are:

- **Atom**

An atom is a fundamental piece of matter. (Matter is anything that can be touched physically.)

- **Element**

An element is a substance that cannot be broken down into any other substance. Every element is made up of one type of atom.

- **Nucleus**

The nucleus (plural nuclei) is the central part of the atom; it contains the protons and neutrons.

- **Neutron**

The neutron is a subatomic particle found in the nucleus, which has a neutral (not positive or negative) charge.

- **Proton**

The Proton is a subatomic particle found in the nucleus, which has a positive electric charge of  $+1e$ .

- **Electron**

An electron is a negatively charged subatomic particle. It can be either free (not attached to any atom) or bound to an atom's nucleus.

- **Mass Number**

The mass number of an atom is its total number of protons and neutrons.  $\text{Mass} = \text{Number of Protons} + \text{Number of Neutrons}$

- **Atomic Number**

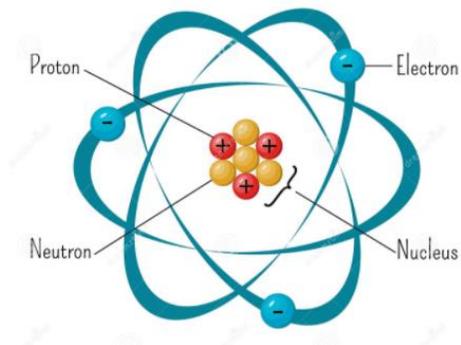
The atomic number of a chemical element is the number of protons in the nucleus of an element's atom.

- **Isotopes**

Isotopes are variants of a particular chemical element that differ in Neutron number. (Proton number is the same)

- **Noble Gases**

The noble gases, also called inert gas, make up a class of chemical elements with similar properties. They are all odorless, colorless, with very low chemical reactivity. Noble Gases include helium, neon, argon, krypton, xenon.



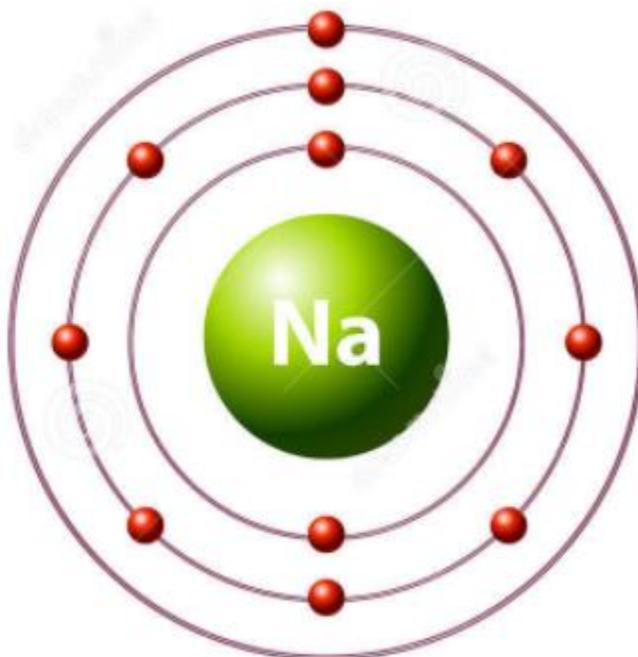
## Mass and Electric Charge

The two critical properties of Protons, Neutrons, and Electrons are Mass and Electric charge.

Particle	Mass	Charge
Proton	1	+1
Neutron	1	0
Electron	Almost zero	-1

## Electron Shells

Electrons in atoms exist in spherical shells of various distances from the nucleus, representing energy levels. The larger the spherical shell, the higher the energy contained in the electron. Each shell has a maximum number of electrons it can hold. Electrons will fill the shells nearest the nucleus first. The first shell can hold two electrons. The second shell can have a max of eight electrons. Electron arrangement is written as 2,8,8



Noble gasses are inert because their outer electron shell is full. They do not need to lose or gain any electrons.

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## VERSION INFORMATION

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