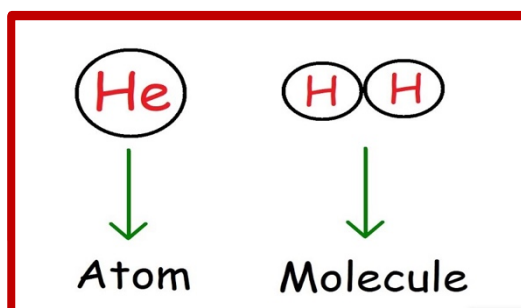


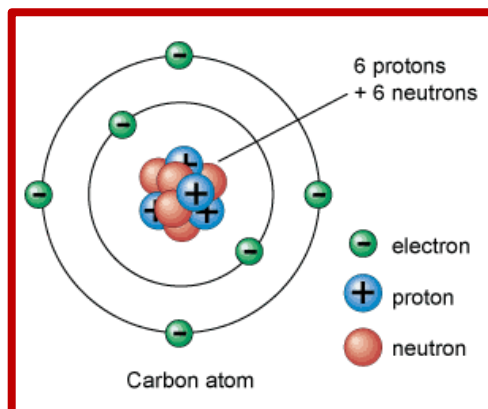
### 3 | Atomic Structure

#### ----- Atoms & Molecules -----

- All substances are made out of atoms.
- An atom is the smallest piece of an element that can exist.
- A molecule consists of two or more atoms that are chemically combined together.
- Molecules can contain atoms of the same kind or different elements.
- Example:  $\text{NH}_4$  is a molecule, while  $\text{H}$  is an atom.



#### ----- Structure of an Atom -----



- An atom consists of three subatomic particles: protons, neutrons and electrons.
- The nucleus of an atom is the centre of the atom, which contains the protons and the neutrons.

### 3 | Atomic Structure

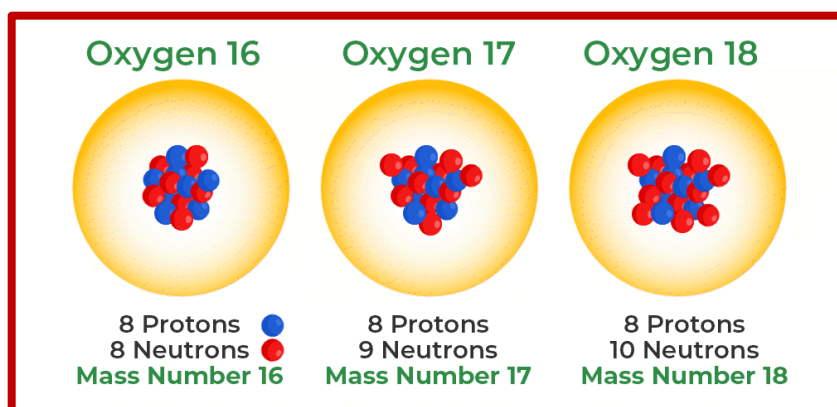
- The electrons are orbiting around the shells of the nucleus.
- The atom is neutral in charge because the number of protons and electrons are the same. The opposite charges will get balanced.
- The relative mass of proton is 1 and the relative charge of the proton is +1.
- The relative mass of neutron is 1 and its relative charge is 0.
- The relative mass of electrons are  $1/1836$  and its relative charge is -1.

#### -----Atomic Mass Number & Atomic Number-----

- Atomic number is referred as the number of protons of an atom's nucleus.
- Atomic mass number refers to sum of the number of protons and the number of electrons.
- The number of neutrons is gained over the difference between the mass number and the atomic number.
- The number of electrons is equal to the number of protons.

#### -----Isotopes-----

- An isotope can be defined as if the atoms of the same element have the same atomic mass but different mass number due to varying number of neutrons.



### 3 | Atomic Structure

- Since an element has isotopes, we check for its relative atomic mass.
- Relative atomic mass is defined as the average mass of an atom after taking account of the abundance of each isotope and its mass number.
- $$A_r = \frac{(Isotope^1 \times Abundance\ of\ Isotope^1) + (Isotope^2 \times Abundance\ of\ Isotope^2)}{100}$$