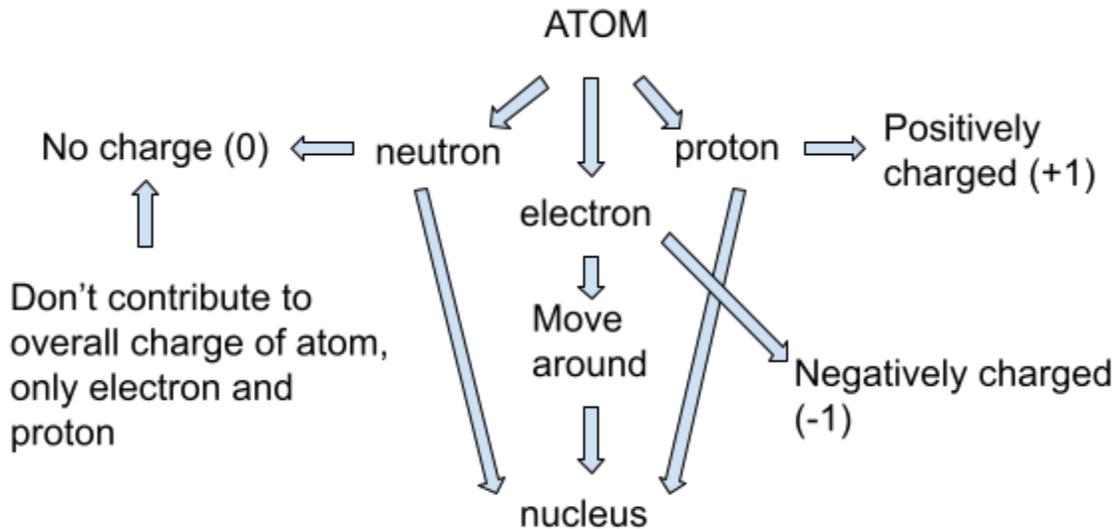


Chapter 8

- An atom cannot be seen with naked eye (extremely small)

→ 1 million carbon atoms = diameter of a strand of hair that is between 0.001 - 0.006

→ 50 million hydrogen atoms = a strain of rice that is 0.5 cm



-Mass of atom

- Mass of nucleus
OR
nucleus
- Proton and nucleus

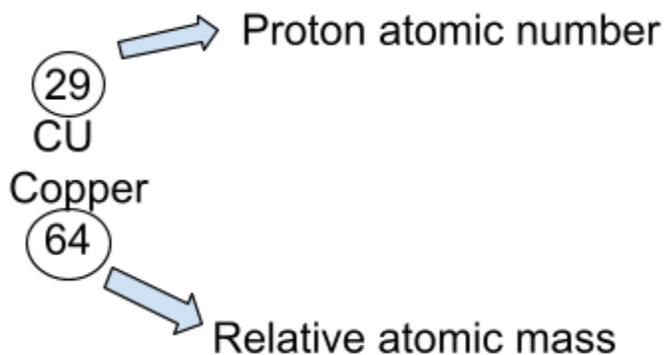
^^ Electrons have mass too but they are much lighter than compared to proton and

***must know**

Type of subatomic particles	Relative charge (how heavy they are compared to each other)	Relative mass	Position in the nucleus
Proton	+1	1	Within the nucleus
Electron	-1	1/1840	Around the nucleus
Neutron	0	1	Within the nucleus

-Proton number is written on top of the element in the periodic table
 Since proton = electrons, you will know the number of electrons too.

To find the number of neutrons, take the relative atomic mass that is under the name of the element and minus it from the number of protons.



$$\begin{array}{rcl} \text{Relative atomic mass} - \text{Proton atomic number} & = & \text{neutrons} \\ 64 - 29 & = & 35 \end{array}$$

***must know**

Type of subatomic particles	Relative charge (how heavy they are compared to each other)	Relative mass	Position in the nucleus
Proton	+1	1	Within the nucleus
Electron	-1	1/1840	Around the nucleus
Neutron	0	1	Within the nucleus

- Neutrons in an atom are not always equal to the number of protons in an atom. Eg :

Type of atom	Number of proton	Number of electron	Number of neutron
carbon	6	6	6,7,8
Nitrogen	7	7	7,8

-Number of proton = number of electron
(Positive charge = negative charge)

Eg :

Type of atom	Number of proton	Number of electron	Overall charge
hydrogen	(+)1	(-)1	0
helium	(+)2	(-)2	0

^^ Neutral means 0 charge.

When both numbers of protons and electrons are the same , their overall charge will definitely end up as 0, which also means they are neutral. So neutrons are also neutral as they have 0 charges.

- Neutrons in an atom are not always equal to the number of protons in an atom. Eg :

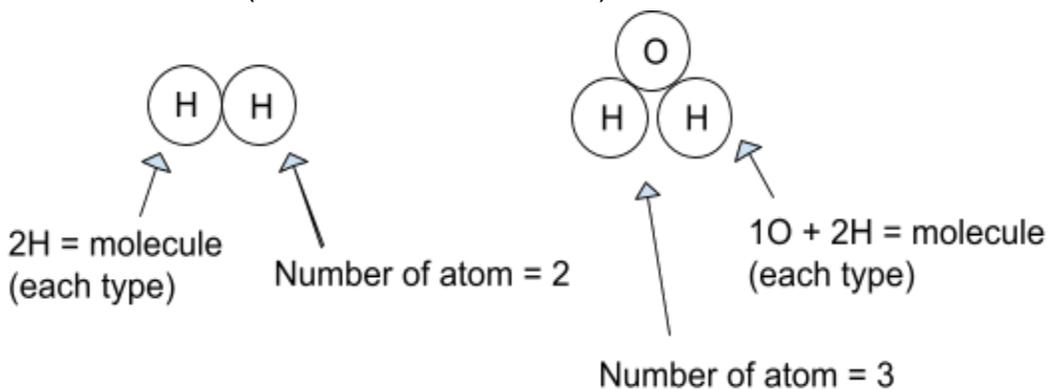
Type of atom	Number of proton	Number of electron	Number of neutron
carbon	6	6	6,7,8
Nitrogen	7	7	7,8

^^Atomic number = proton number

^^Number of nucleus = protons + neutrons

-Molecules consist of two or more atoms that are **chemically combined** together.

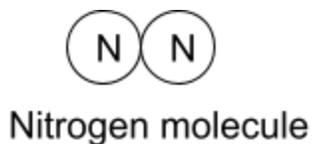
Atom + Atom = Molecule
(can be same or different)



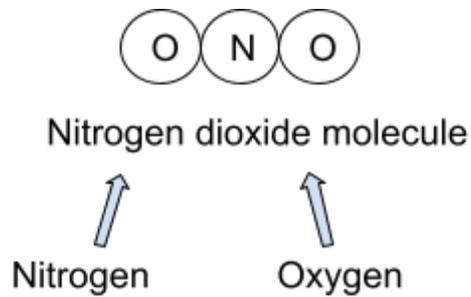
-chemical formula is another way to represent molecules. It identifies each constituent element in a molecule by its chemical symbol, and indicates the number of atoms of the element. Eg :

Type of molecule	Chemical formula	Type of atom in the molecule	Number of atom in the molecule
Hydrogen	H ₂	Hydrogen	2

-**Molecules of an element** consist of only one type of atoms that are chemically combined. Eg : (N₂) & (O₂)



-**Molecule of a compound** consist of 2 or more types of atoms that are chemically combined. Eg : (NO₂)



-*remember the meaning and apply it in other context

S8 (a chemical formula) = element because...

Elements cannot be broken down into simpler substances by chemical or physical methods. S8 is only made up of one type of atom and cannot be broken down into simpler substances. Hence it is an element.

CH4 (also known as methane) = compound because...

Compounds are made up of two or more elements that are chemically combined in a fixed proportion by mass. In methane, each molecule is made up of one carbon atom bonded to four hydrogen atoms.

The reason why we don't write chemical formulas for mixtures is because there is no ratio to write them in.

-The knowledge of atom has been used for medical purposes and provide nuclear energy.

