Atoms and Reactions The Atom

Atoms are made up of **Protons, Neutrons** and **Electrons** 

**Atoms** are the stuff all elements and compounds are made of. They're made up of 3 types of **subatomic** particle – **protons, neutrons** and **electrons**.

The mass and charge of these subatomic particles are **tiny**, so **relative mass** and **relative charge** are used instead.

Subatomic Particle	<b>Relative Mass</b>	Relative Charge
Proton	1	+1
Neutron	1	0
Electron	1/2000	-1

## Nuclear Symbols show Numbers of Subatomic Particles

You can figure out the **number** of protons, neutrons and electrons from the **Nuclear Symbol**.



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protons.
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## Isotopes are Atoms of the Sane Element with Different Numbers of Neutrons

Isotopes of an element are atoms with the same number of protons but different numbers of neutrons

- It's the number and arrangement of electrons that decides the chemical properties of an element. Isotopes have the same configurations of electrons, so they've got the same chemical properties.
- Isotopes of an element do have slightly different physical properties though, such as different densities, rates of diffusion, etc. This is because physical properties tend to depend more on the mass of the atom

## Exam Questions

**Q1)** Hydrogen, Deuterium and Tritium are all isotopes of each other.

- a) Identify one similarity and one difference between these isotopes [2 Marks]
- **b)** Deuterium can be written as <sup>2</sup>H. Determine the number of protons neutrons and electrons in a neutral deuterium atom. [1 Mark]
- c) Write a nuclear symbol for tritium, given that it has 2 neutrons. [1 Mark]