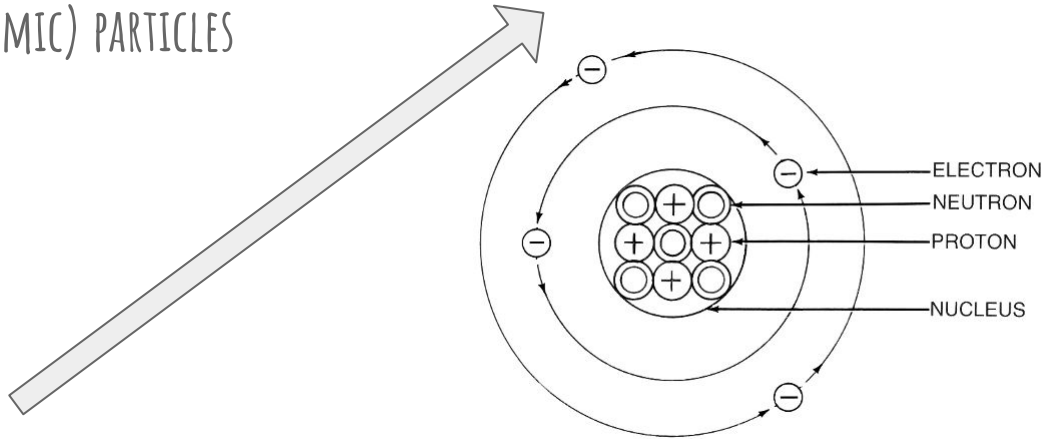
Atoms and elements recap

Learning objectives

- Know what an atom is - and what dalton had to say about atoms
- Understand difference between atoms and elements
- Know that different elements have different properties
- Know that all elements have a name and a symbol
  - (we will be covering other 'advanced' stuff as well but the points above are the basis of today's session)

What is an atom?

- Comes from the greek word 'atomos' - indivisible
- Atoms are the "building blocks" of all matter and are the simplest form of particle.
- Made up of even smaller (subatomic) particles



- Definition given on VLE. Learn it!

Subatomic particles

- They are all made up of protons, neutrons and electrons.
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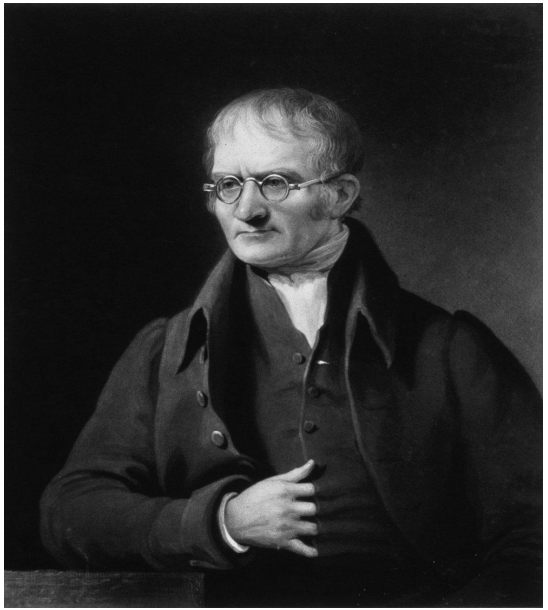
Subatomic particle	Location	Mass	Charge
Proton	Nucleus	1	+1
Neutron	Nucleus	1	No charge
Electron	Shells	0 (negligible)	-1

John dalton

-first modern scientist who tried to explain what's happening on an atomic level.

-came up with the dalton model:

1. all matter is made up of atoms
2. there are different types of atom
3. each element contains a different type of atom



Elements

-CGP KS3 book's definition:

Element = a substance that contains only one type of atom

What's the difference between an atom and an element?

-atoms are the particles that make up an element. An element is made up of atoms of one type.

-different elements have different properties

-e.g. Sodium is a soft metal which you can cut and oxygen is a colourless gas.

Nomenclature

-over 100 elements, so writing out each element's name each time you mention one would take too long.

-so we developed a system:

-each element has a symbol (usually one or two letters). first letter is always capital and second letter is always lower case.

-you can find the symbols on the periodic table

Some handy tips

–some symbols make sense in english. E.g. ‘O’ in the periodic table is the symbol for oxygen.

-but some symbols are based on latin. E.g. gold is ‘Au’ in the periodic table. ‘Au’ is the latin word ‘aurum’-gold

-you don’t need to learn all the symbols, but there are some useful ones to learn:

1. Oxygen = O
2. Carbon = C
3. Hydrogen = H
4. Sodium = Na
5. Chlorine = Cl
6. Iron = Fe
7. Magnesium = Mg
8. Aluminium = Al
9. Copper = Cu

Practice questions

1. Carbon is an element, if carbon was broken down into atoms, could the atoms then be turned into another element? Explain your answer. (2 marks)

2. An atom of nitrogen has an atomic number of 7 and a mass number of 14. Give the number of electrons, protons and neutrons in the atom. (3 marks)

3. What are the 3 main principles of the dalton model? (3 marks)