

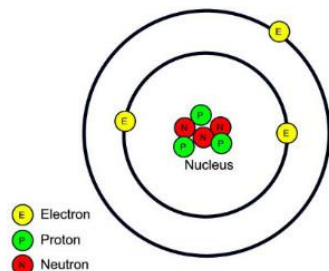
Knowledge Organiser – Year 7 Atomic Structure

Key words

Term	Definition
Atom	Smallest part of an atom that can exist
Proton	Subatomic particle with a charge of +1
Neutron	Subatomic particle with a charge of 0
Electron	Subatomic particle with a charge of -1
Nucleus	Centre of an atom with protons and neutrons
Electron Shell	Where electrons are found. Maximum of 2 in the first shell, 8 in the second and 8 in the third
Stable	Atoms are said to be stable if their outermost electron shell contains its maximum number of electrons (2 for shell 1, 8 for shell 2, 8 for shell 3).
Periodic table	An organisation of atoms grouping them according to their atomic number (number of protons)
Group	Vertical column. Group 1 relates to the number of electrons in the outermost shell, e.g. group 1 elements all have 1 electron in their last shell. Group 0 elements have full outer shells.
Period	Horizontal rows of the periodic table. Each row tells you how many shells the atom has. Period 1 elements have one shell, period 2 elements have 2 shells etc.
Atomic number	Number of protons the atom has.

Atomic structure

An atom is made up of three particles: protons, neutrons and electrons. Protons and neutrons are found together in the nucleus, electrons are found in electron shells. Atoms come in different types, each 'type' has a different number of protons. For example all atoms with 1 proton are hydrogen, all with 2 are helium etc.



Subatomic particle	Charge
Proton	+1
Neutron	0
Electron	-1

Properties of metals

Malleable: to be hammered into shape without breaking

Electrical conductor: allow an electrical current to be transferred through

Thermal conductor: allows heat energy to be transferred through

Lustrous: Shiny

Ductile: drawn into a wire

Electron shells

Shell	Maximum number of electrons
1	2
2	8
3	8

Electrons go in shells which are around the nucleus of the atom (where the protons and neutrons are). The electrons fill the shells from the closest to the nucleus outwards. A maximum of 2 can fit in the first shell, a maximum of 8 in the second shell and a maximum of 8 in the third. This can be written as 2, 8, 1.

Having a full outer shell of electrons makes an atom more stable. Atoms will lose or gain electrons in order to get a full outer shell. This happens during chemical reactions.

Elements

Elements are substances made up of only one type of atom.

Molecules

A collection of two or more atoms held together by chemical bonds.

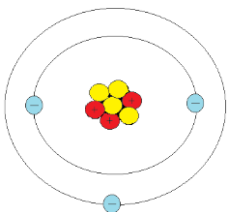
Compounds

Substance that contains atoms of two or more *different* elements held together by chemical bonds.

Mixtures

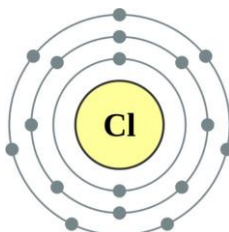
Two or more different substances that are not joined together.

Group 1



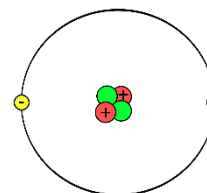
Group 1 elements are in the first column of the periodic table and are also known as the alkali metals. They are soft, shiny metals such as lithium and sodium. They have 1 electron in their outermost shell and will lose these in chemical reactions.

Group 7



Group 7 elements are known as the halogens. They all have 7 electrons in their outermost shell. They will gain electrons so that their outermost shell has 8 (7 + 1). In chemical reactions they will gain an electron so that they are more stable.

Group 0



Group 0 elements are found in the column on the furthest right of the periodic table. They are also called the Noble gases. They are very unreactive as they always have a full outer shell so do not react to lose or gain one.