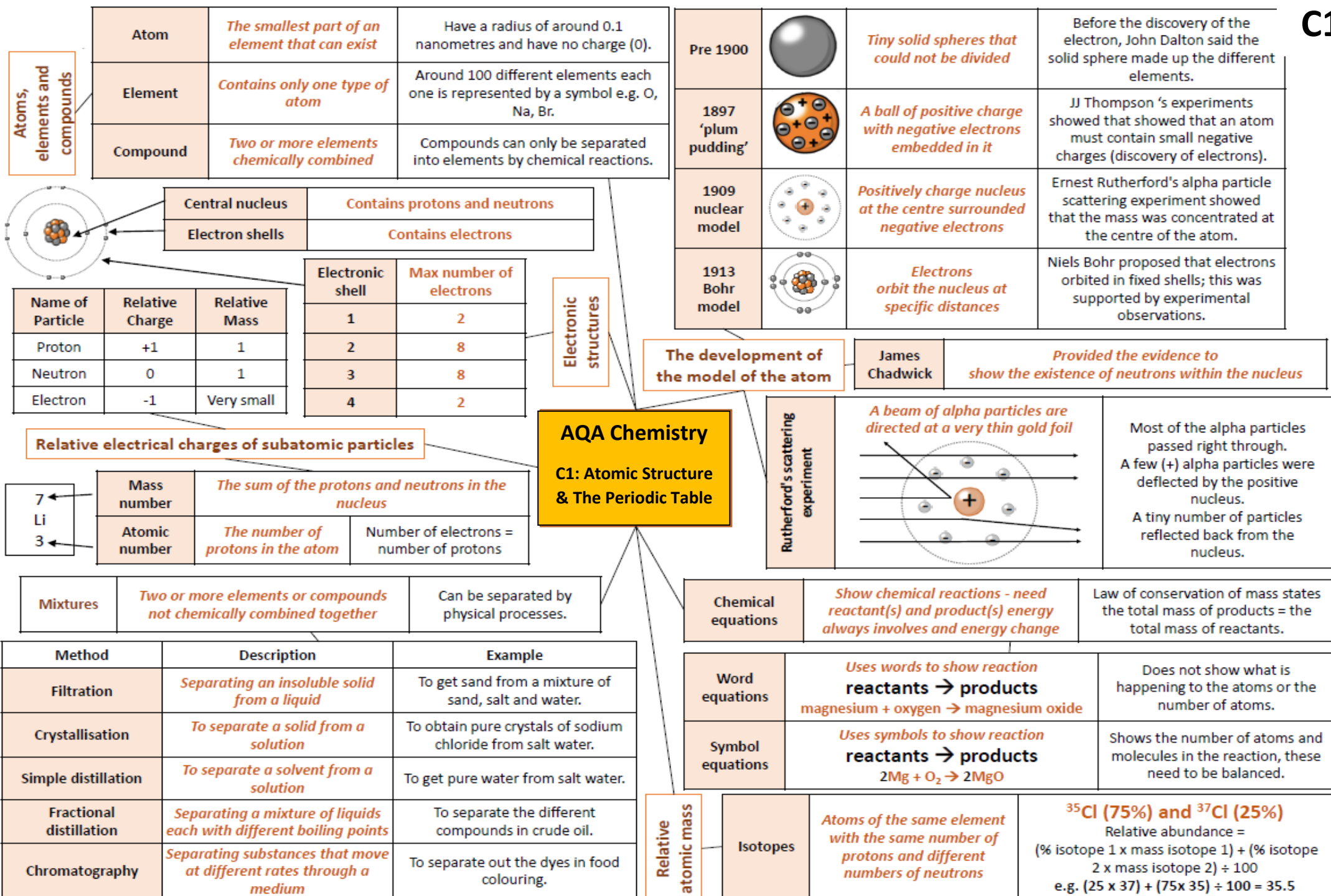




										Alkali metals										Halogens										Noble gases									
1	2	Transition metals																3	4	5	6	7	0																
H																		B	C	N	O	F	He																
Li	Be																	Al	Si	P	S	Cl	Ar																
Na	Mg																	Ga	Ge	As	Se	Br	Kr																
K	Ca	Sc	Ti	V	Cr	Mn	Fe	Co	Ni	Cu	Zn	Ga	Ge	As	Se	Br	Kr																						
Rb	Sr	Y	Zr	Nb	Mo	Tc	Ru	Rh	Pd	Ag	Cd	In	Sn	Sb	Te	I	Xe																						
Cs	Ba	La	Hf	Ta	W	Re	Os	Ir	Pt	Au	Hg	Tl	Pb	Bi	Po	At	Rn																						
Fr	Ra	Ac	Rf	Db	Sg	Bh	Hs	Mt	?	?	?																												

Metals to the left of this line, non metals to the right

Metals	To the left of the Periodic table	Form positive ions. Conductors, high melting and boiling points, ductile, malleable.
Non metals	To the right of the Periodic table	Form negative ions. Insulators, low melting and boiling points.

Metals and non metals

Group 7

Elements arranged in order of atomic number

Elements with similar properties are in columns called groups

Elements in the same group have the same number of outer shell electrons and elements in the same period (row) have the same number of electron shells.

The Periodic table

Development of the Periodic table

Before discovery of protons, neutrons and electrons

Elements arranged in order of atomic weight

Early periodic tables were incomplete, some elements were placed in inappropriate groups if the strict order of atomic weights was followed.

Mendeleev

Left gaps for elements that hadn't been discovered yet

Elements with properties predicted by Mendeleev were discovered and filled in the gaps. Knowledge of isotopes explained why order based on atomic weights was not always correct.

Group 1

Alkali metals

Very reactive with oxygen, water and chlorine

Only have one electron in their outer shell. Form +1 ions.

Reactivity increases down the group

Negative outer electron is further away from the positive nucleus so is more easily lost.

Halogens	Consist of molecules made of a pair of atoms	Have seven electrons in their outer shell. Form -1 ions.
	Melting and boiling points increase down the group (gas → liquid → solid)	Increasing atomic mass number.
	Reactivity decreases down the group	Increasing proton number means an electron is more easily gained
With metals	Forms a metal halide Metal + halogen → metal halide e.g. Sodium + chlorine → sodium chloride	e.g. NaCl metal atom loses outer shell electrons and halogen gains an outer shell electron
With hydrogen	Forms a hydrogen halide Hydrogen + halogen → hydrogen halide e.g. Hydrogen + bromine → hydrogen bromide	e.g. $\text{Cl}_2 + \text{H}_2 \rightarrow 2\text{HCl}$
With aqueous solution of a halide salt	A more reactive halogen will displace the less reactive halogen from the salt Chlorine + potassium bromide → potassium chloride + bromine	e.g. $\text{Cl}_2 + 2\text{KBr} \rightarrow 2\text{KCl} + \text{Br}_2$

AQA Chemistry

C1: Atomic Structure & The Periodic Table

Group 0

Transition metals (Chemistry only)

Noble gases	Unreactive, do not form molecules	This is due to having full outer shells of electrons.
	Boiling points increase down the group	Increasing atomic number.

With oxygen	Forms a metal oxide	Metal + oxygen → metal oxide	e.g. $4\text{Na} + \text{O}_2 \rightarrow 2\text{Na}_2\text{O}$
With water	Forms a metal hydroxide and hydrogen	Metal + water → metal hydroxide + hydrogen	e.g. $2\text{Na} + 2\text{H}_2\text{O} \rightarrow 2\text{NaOH} + \text{H}_2$
With chlorine	Forms a metal chloride	Metal + chlorine → metal chloride	e.g. $2\text{Na} + \text{Cl}_2 \rightarrow 2\text{NaCl}$

Compared group 1	• <i>Less reactive</i> • <i>Harder</i> • <i>Denser</i> • <i>Higher melting points</i>	• <i>Cu^{2+} is blue</i> • <i>Ni^{2+} is pale green, used in the manufacture of margarine</i>
Typical properties	• <i>Many have different ion possibilities with different charges</i> • <i>Used as catalysts</i> • <i>Form coloured compounds</i>	• <i>Fe^{2+} is green, used in the Haber process</i> • <i>Fe^{3+} is reddish-brown</i> • <i>Mn^{2+} is pale pink</i>