AQA C1b Periodic Table TRIPLE CHEMISTRY

The periodic table

Elements are arranged in order of atomic number.

Each horizontal row is called a period. Periodic means "repeating".

Each vertical column is called a group.

Elements in the same group have the same number of electrons in their outer shell as the group number. For example, elements in group 1 all have 1 electron in their outer shell.

hat means elements in the same group have similar chemical properties.

You are always given a periodic table in chemistry exams.

1	2							3	4	5	6	7	0				
		н												Не			
Li	Be	le						В	С	N	0	F	Ne				
Na	Mg											Al	Si	Ρ	S	Cl	Ar
к	Ca	Sc	Ti	v	Cr	Mn	Fe	Co	Ni	Cu	Zn	Ga	Ge	As	Se	Br	Kr
Rb	Sr	Y	Zr	Nb	Mo	Тс	Ru	Rh	Pd	Ag	Cd	In	Sn	Sb	Те	1	Xe
Cs	Ba	La	Hf	Ta	w	Re	Os	lr	Pt	Au	Hg	π	Pb	Bi	Po	At	Rn
Fr	Ra	Ac	Rf	Db	Sg	Bh	Hs	Mt	Ds	Rg	Cn	Nh	Fl	Mc	Lv	Ts	Og

Metals Non-metals

Metals react to form positive ions (they lose electrons)

History of the periodic table

Scientists tried to order elements by their atomic weight. That didn't work very well. Some elements were missing, and others were placed in groups that didn't match with their properties.

A scientist called Mendeleev <u>left gaps</u> for undiscovered elements. He also <u>changed the</u> <u>order</u> of the elements to fit the pattern of properties.

Elements with properties predicted by Mendeleev were discovered and filled the gaps, providing <u>evidence</u> that Mendeleev was correct.

The discovery of isotopes explained why ordering by atomic <u>weight</u> did not always work. The modern periodic table is arranged by atomic <u>number</u>.

<u> </u>	Group 0						
	group 0	are called noble gases					
	unreactive	because they have full outer shells (stable arrangement)					
	outer shell	all group 0 have 8 electrons in their outer shell, except for helium, which has 2 electrons. This is why they are called group 0, and not group 8.					
	boiling points	boiling points increase going down group 0					

Transition metals

Transition metals are found in the middle of the periodic table. They are not in numbered groups. They can form more than one ion, and transition from one ion to another. For example, iron can be Fe^{2+} or Fe^{3+} .

Transition elements form coloured compounds. They are often useful as catalysts (they can make chemical reactions faster).

Compared to Group 1 metals, the transition metals are less reactive, harder, denser and have higher melting points.

They are ver water and ch	y reactive with oxygen, llorine	They only have 1 electron in their outer shell. They form +1 ions				
	y of Group 1 elements you go down the group	As you go down the group the atoms get bigger. This means that the negative outer electron is further from the positive nucleus so it is more easily lost				
react with oxygen	metal + oxygen → met	tal oxide	observe: bright light, flame, white solid produced			
react with water	metal + water → metal h hydrogen	ater → metal hydroxide + hydrogen observe: fizzing (gas produced), metal moves on water, flame (for Na or K). meta further down the group react more violent				
react with chlorine	\rightarrow metal + chlorine \rightarrow metal chloride		observe: bright light, flame, white solid produced			

	halogens are made of molecules. Each molecule contains a pair of atoms.	halogen atoms have 7 electrons in their outer shells. They form -1 ions					
ens	melting and boiling points increase down the group (gas at the top, then liquid, then solid)						
	reactivity decreases down the group because	as the atoms get bigger, the nucleus is further from the outer shell so has less attraction to outer electrons					
halogens	react with metals metal + halogen → metal_halide	e.g. 2Na + Cl ₂ → 2NaCl					
	react with hydrgoen hydrogen + halogen → hydrogen halide	e.g. $Cl_2 + H_2 \rightarrow 2HCl$					
Group	take part in displacement reactions:	e.g. $Cl_2 + 2KBr \rightarrow 2KCl + Br_2$					
	a more reactive halogen will displace the less reactive halogen from the salt.						

Group1 - alkali metals