	Chapter 1	Separation Techniques	Group 1 (Alk
Keywords Compound Substance that contains at least two different elements, chemically combined Mixture Made up of many substances that can be easily separated, that	Deriodic Table         The Periodic Table is arranged in such a way that elements with the same properties can be found together in 'groups'.         Elements in the same group have the same number of electrons in their outershell (these are known as valance electrons).         Elements in the same period have the same	<ul> <li>Separation lechniques</li> <li>Chromatography - separates out different liquids. An Rf value can be calculated to compare the different parts.</li> <li>Filtration - Separates a solid (S) from a liquid (L).</li> <li>Crystallisation - Separates out a solid that has dissolved in a liquid. The liquid evaporates leaving the solid behind.</li> <li>Distillation - Separates out liquids that have different boiling points, or to keep a liquid from a S+L mixture.</li> </ul>	Group 1 (Alk React with water Lithium + water - React vigorously Sodium + chloring Reactivity increa electron is furthe lost. Lower melting ar
aren't chemically combined <i>Element</i> A substance that cannot be broken down chemically (and is made up of all the same type of atom) <i>Atom</i> The 'basic building block' of an element - which cannot be chemically broken down <i>Subatomic Particle</i> Atoms are made up of three particles: protons, neutrons and electrons. Subatomic means "smaller than an atom".	number of electron shells. Atomic Structure The atomic number is the number of protons. The number of electrons = number of protons. The number of neutrons = mass number - atomic number.	Balancing EquationsThe same number of atoms of each element are needed on each side of an equation:Na + $Cl_2 \rightarrow NaCl$ 1 sodium on each side 2 chlorine on left, 1 on rightNa + $Cl_2 \rightarrow 2NaCl$ 1 sodium on left, 2 on right 2 chlorine on each sideNa + $Cl_2 \rightarrow 2NaCl$ 1 sodium on left, 2 on right 2 chlorine on each side2Na + $Cl_2 \rightarrow 2NaCl$ 2 sodium on each side 2 chlorine on each side2Na + $Cl_2 \rightarrow 2NaCl$ 2 sodium on each side 2 chlorine on each side	Exist as pairs of a Less reactive do from the nucleus Higher melting an A more reactive halogen. Group 0 (Nol These elements h Boiling point incr electrons so stro molecules. Metals
(Law of) Conservation of Mass the total mass or reactants equals the total mass of products formed Inert Unreactive Displacement Chemical reaction where one element 'swaps out' a less reactive element from a compound Trend A change in properties in a general direction E.g. there is a trend of decreasing reactivity down the group	Isotopes These are different forms of the same element. Same atomic number (same protons) Different mass number (change in neutrons) Relative atomic mass = Σ(isotope abundance% x isotope mass number) 100 Isotopes of Carbon Sotopes of Carbon 12 12 13 13 14 Carbon-12 Carbon-13 Carbon-14 B protons B neutrons B neutrons	Electron Configuration Atoms fill to a maximum of 2 electrons in the first shell, 8 in the second and 8 in the third. Each shell is filled before starting the next shell.	Metals generally shiny, malleable electricity. Transition metal generally form co These metals are the rate of a read Newlands notice atomic weights t this The Law of C Mendeleev arran and noticed a pa didn't fit the pat gaps) - something

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# lkali Metals)

ter to form an alkaline solution:  $r \rightarrow$  lithium hydroxide + hydrogen

ly when heated with chlorine gas: ine  $\rightarrow$  sodium chloride

eases down the group - the outer negative ther from the positive nucleus so more easily

and boiling points down the group.

# lalogens)

f atoms.

down the group - the outer shell is further us so harder to gain an electron. and boiling points down the group. ive halogen will displace a less reactive

# loble Gases)

s have full outer shells so are inert.

acreases down the group as atoms have more tronger intermolecular forces form between

lly have the properties of : strong, dense, ole, ductile, good conductors of heat and

tals each have more than one ion, and coloured compounds.

are often used as catalysts, as they can alter eaction without taking part themselves.

## vs Mendeleev

iced similarities between elements with s that had a difference of seven. He called f Octaves.

anged his table in order of atomic weight, pattern emerging too. Where the elements pattern, he moved them (sometimes leaving ing Newlands didn't do.

<b>Chapter 1</b> Atomic Structure and the Periodic Table		Separation Techniques Describe how you would separate sodium chloride solution if you: (a) Wanted only the solid	Group 1 (Alka Give the word an potassium with wat
Keywords Compound Substance that contains at least two different elements, chemically combined	Periodic Table Describe the position of carbon in the periodic table.	<ul> <li>(a) Wanted only the solid</li> <li>(b) Wanted both the solid and liquid</li> </ul>	
<i>Mixture</i> Made up of many substances that can be easily separated, that aren't chemically combined		Palancing Equations	Group 7 (Halo Compare the trend
<i>Element</i> A substance that cannot be broken down chemically (and is made up of all the same type of atom)	Atomic Structure If an atom has 3 protons, 4 neutrons and 3 electrons, what is its atomic mass? What element is this?	Balancing Equations Na + H <sub>2</sub> O —> NaOH + H <sub>2</sub>	
<i>Atom</i> The 'basic building block' of an element - which cannot be chemically broken down		$H_2 + O_2 \longrightarrow H_2O$	
Subatomic Particle Atoms are made up of three particles: protons, neutrons and electrons. Subatomic means "smaller than an atom".		HCl + Mg(OH) <sub>2</sub> -> MgCl <sub>2</sub> + H <sub>2</sub> O	Group 0 (Nob Explain the reactiv
(Law of) Conservation of Mass the total mass or reactants equals the total mass of products formed Inert Unreactive	<b>Isotopes</b> There are two atoms <sup>28</sup> Si and <sup>30</sup> Si of abundance 96% and 4%, respectively. What is the relative atomic mass of Si? Give your answer to 3s.f.	Electron Configuration Explain where an atom with an electronic	Metals Give two difference
Displacement Chemical reaction where one element 'swaps out' a less reactive element from a compound		configuration of 2,8,2 is positioned in the periodic table.	<b>Newland vs M</b> Explain why we u table today, rather
Trend A change in properties in a general direction E.g. there is a trend of decreasing reactivity down the group			

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## lkali Metals)

d and symbol equation for the reaction of water.

alogens) rend of reactivity with that in group 1.

# oble Gases)

ctivity of the elements in Group 0.

rences between metals an non metals.

## s Mendeleev

ve use Mendeleev's version of the Periodic ther than Newland's

	Charten 4		
<b>Chapter 1</b> Atomic Structure and the Periodic Table		Separation Techniques Describe how you would separate sodium chloride solution if you: (a) Wanted only the solid	Give the word potassium with
Keywords	Periodic Table	(b) Wanted both the solid and liquid	Potassium +
<i>Compound</i> Substance that contains at least two different	Describe the position of carbon in the periodic table.	Description of crystallisation	hydrogen
elements, chemically combined	Carbon is in group 4 because it has 4 electrons on its outer shell, and it is in	Description of distillation	2K + 2H <sub>2</sub> O —2
<i>Mixture</i> Made up of many	period 2 as it has 2 shells of electrons.		
substances that can be easily separated, that aren't chemically			Group 7 (Ha
combined		Balancing Equations	As you go dou
Element A substance that cannot	Atomic Structure If an atom has 3 protons, 4 neutrons and 3	Na + $H_2O \rightarrow NaOH + H_2$	as the outer e
be broken down chemically (and is made up of all the same type of atom)	electrons, what is its atomic mass? What element is this?	<b>2</b> Na + <b>2</b> H <sub>2</sub> O —> <b>2</b> NaOH + H <sub>2</sub>	nucleus, easil reactivity dec
<i>Atom</i> The 'basic building block' of an element - which	Atomic mass = 7 Lithium	$H_2 + O_2 \longrightarrow H_2O$	to attract an
cannot be chemically broken down		$2H_2 + O_2 -> 2H_2O$	
Subatomic Particle Atoms are made up of three particles: protons,			Group 0 (No Explain the read
neutrons and electrons. Subatomic means "smaller than an atom".		$HCl + Mg(OH)_2 \rightarrow MgCl_2 + H_2O$	Not reactive
(Law of) Conservation of	Isotopes	<b>2</b> HCl + Mg(OH) <sub>2</sub> $\rightarrow$ MgCl <sub>2</sub> + <b>2</b> H <sub>2</sub> O	of electrons a
<i>Mass</i> the total mass or reactants equals the total mass of products formed	There are two atoms <sup>28</sup> Si and <sup>30</sup> Si of abundance 96% and 4%, respectively. What is the relative atomic mass of Si?		Metals Give two differe
<i>Inert</i> Unreactive	Give your answer to 3s.f. ((28*96)+(30*4))/100 = 28.1	Electron Configuration Explain where an atom with an electronic	Any two diffe
Displacement Chemical reaction where		configuration of 2,8,2 is positioned in the periodic table.	
one element 'swaps out' a less reactive element from a compound		Group 2 (2 outer electrons), period 3 (3	Newland vs Explain why we table today, rat
<i>Trend</i> A change in properties in		shells)	Mendeleev le
a general direction			elements didi
E.g. there is a trend of decreasing reactivity down the group			properties of

## lkali Metals)

d and symbol equation for the reaction of water.

+ water —> potassium hydroxide +

-> 2KOH + H<sub>2</sub>

### alogens)

rend of reactivity with that in group 1.

own group 1 the reactivity increases electron is further away form the ily lost. This is also the reason why the creases down group 7 as it's harder electron.

oble Gases)

activity of the elements in Group 0.

(inert) as they have a full outer shell already.

rences between metals an non metals.

erent correct properties given

#### s Mendeleev

ve use Mendeleev's version of the Periodic ather than Newland's

eft gaps in his table as some of the In't fit in his model. He predicted the f these elements... and was correct.