Curriculum Overview – Science with GCSE Synergy					
	Year 7	Year 8	Year 9	Year 10	Year 11
Atomic structure & the periodic table	The idea that matter is made from matter is introduced in the matter topic in Year 7 as is the existence of negatively charged electrons.	The periodic table is introduced formally along with its usefulness in making predictions Students learn about the structure of the periodic table, group 1 elements and how the periodic table is useful	Students study how atomic structure has developed over time. This demonstrates how scientists develop ideas over time through experimentation and the discovery of new evidence. Students the structure of the atoms in terms of sub-atomic particles is studied.	Students revisit atomic structure and consolidate their Year 9 learning.	The link between the structure periodic table and electron structure is introduced as a way of explaining trends in reactivity which are observed in groups 1 and 7 along with the inert nature of the noble gases. Groups 1, 7 and 0 are studied. The role of Mendeleev in developing the modern periodic table gives students an insight into how scientific ideas develop and become accepted on the basis of evidence.
Properties of matter	The particle model is formally introduced, and students learn how to use it to explain the properties of the different states of matter. Students use the particle model to explain diffusion. Students are introduced to the link between changes of state and energy and as part of this learning to explain the shape of heating (or cooling) curves Students learn about solubility and in particular the link between solubility and temperature for solid. Students learn what a mixture and a pure substance are in terms of particles.	The differences between metals and non-metals are investigated and the concepts of elements, compounds. The existence of different materials such as polymers, composites and ceramics are introduced and their useful properties linked to their uses.			Organic Chemistry is introduced through study of the alkanes.

	During this students will interpret simple graphs and describe trends shown by graphs. The properties of metals and non- metals and the usefulness of classifying materials is studied.			
Bonding	The concept that in solids and liquids particles are held together by attractive forces is introduced.		Types of bonding are introduced along with the structures of materials. Students learn about ionic, covalent and metallic bonding in terms of electrons. Students learn about giant ionic lattice, giant covalent, molecular, metallic and fullerene structures. Nanoparticles will also be introduced and their properties and usefulness studied.	The link between properties of ionic compounds and their structure is developed when studying electrolysis The link between chain length and the strength of intermolecular forces is developed by studying the trend in boiling points in the alkanes.
Chemical change	The concept of the reactivity series of metals is introduced through studying the reaction of metals and acids and displacement reactions. The usefulness of the reactivity series in allowing predictions about reactivity to be made is highlighted. Oxidation reactions are introduced in terms of oxidation. The concept of acidity, alkalinity and pH is introduced. The use of indicators is studied and the concept of neutralization is introduced. Investigating the effectiveness of indigestion remedies allows students to develop their investigative skills.	The concept of the reactivity series of metals is introduced through studying the reaction of metals and acids and displacement reactions. The usefulness of the reactivity series in allowing predictions about reactivity to be made is highlighted. Oxidation reactions are introduced in terms of oxidation. Rusting is studied will provides a real world application of ideas about the reactivity series.		Understanding of reactivity series and it link to metal extraction is developed further. The concept of redox in terms of electrons is introduced. Explanation of acids and alkalis and neutralisation in terms of hydrogen and hydroxide ions are introduced. The concept of the pH scale is developed in terms of hydrogen ions and the concept of strong and weak acids is introduced. Students study the use of electrolysis to separate the

				elements in ionic
				compounds.
Earth &	The structure of the Earth is		The evolution of the Earth's	
atmosphere	introduced and igneous, sedimentary		atmosphere is introduced.	
atmosphere	and metamorphic rocks are explored.			
	The second secon		Forms of air pollution, their	
	I nese ideas are then pulled together		causes, impact and now we	
	In the rock cycle.		can reduce them are also	
			studied.	
			The offect of mineral	
			overaction on the Earth is	
			explored and alternative less	
			damaging ways of extracting	
			metal ores are explored	
			metal ores are explored.	
Rate of				The concept of rate of
				reaction and how this is
reactions				explained by collision theory
				is introduced.
				The effect of catalysts is
				introduced.
				Practical methods for
				measuring rate of reaction
				are demonstrated and
				practiced by students.
				The concept of reversible
				reactions and equilibria are
				also introduced. The effect of
				making changes to various
				factors on the position of an
<u> </u>				equilibrium are studied.
Energy		in chamical results with		The concept of energy
changes		in chemical reactions is		changes in chemical reactions
		introduced.		is developed further.
		Roth exothermic and		Enormy profile diagrams are
		both exothermic and		introduced es in the second
		investigated and the structure		of activation on arms
		of the words highlighted		of activation energy.
		or the words highlighted		The calculation of the energy
				change of a reaction using
				mean bond enthalpies is also
				studiod
			1	studieu.

Quantitativo	The use of word equations to	The use of symbols to	The meaning of chemical	The principle of conservation
Quantitative	represent chemical reactions is used	represent common elements	formulae will be reinforced.	of mass in a chemical
chemistry	throughout this year.	will be introduced.		reaction is reinforced.
			The use of balanced symbol	
	Formulae of common compounds	The meaning of chemical	equations will be reinforced.	The concept of relative
	such as water may be used.	formulae will be explored.		formula mass is introduced.
		The use of symbol equations		
		will be developed and used for		
		most reaction and the concept		
		of balancing equations will be		
		developed.		
Chemical	Students will be introduced to the		Students will revisit the	Students will develop their
analysis and	fundamental separation techniques		separation techniques and	understanding of how to put
	of filtration, distillation and		build on their knowledge of	techniques together in order
preparation	chromatography		each technique as well as	to prepare crystals of a salt.
	During the tenie students will learn		distillation	Students will learn about
	bow to carry out these techniques		distillation	students will learn about
	practically as well as the purpose of		Students will learn how to	nerform a crystallization
	each and when they might be used		determine the Rf value of a dot	perform a crystallization.
	cuch and when they might be used.		on a paper chromatogram	Students will develop their
				understanding of
				chromatography how
				chemical tests and
				instrumental techniques are
				used in analytical chemistry.
				The principles of how a
				fractionating column is used
				to separate crude oil are
				studied.
				-
				ine use of distillation,
				reverse osmosis and filtration
				numerent methods for the
				as well as the treatment of
				wastewater are studied The
				allows students to see real
				world applications for
				practical techniques they
				have learnt.