Торіс	What will I learn?	How will I learn it?	Why is it important that I learn this?	Why am I learning this now?
Year 9 – Term	1			•
<u>Basic</u> <u>Chemistry</u>	You will develop a deeper knowledge and understanding of atoms, elements, compounds and mixtures. You will learn to represent chemical reactions using formulae and equations You will expand your knowledge of simple techniques to separate mixtures.	Through teacher input and demonstration. Through practical work and data analysis with an emphasis on chromatography. Through independent learning and research. Through the making and use of revision resources to conclude the topic.	The concepts studied at the start of year 9 are the basis for all further study in Chemistry.	This topic builds on the work in Year 7 looking at pure substances and separating mixtures. This topic also prepares you for the practical work you will carry out throughout the GCSE Chemistry course.
<u>Atomic</u> <u>Structure</u>	You will learn the basic structure of an atom and how the structure links to the periodic table. What an isotope is and how to calculate relative atomic mass. How scientific theories develop over time by studying different models of the atom.	Through teacher input and demonstration. Through using models and diagrams to represent ideas about atoms. Through independent research and enquiry. Through the making and use of revision resources to conclude the topic.	To gain an appreciation of how scientific ideas and explanations develop over time as new evidence emerges. Knowledge of atomic structure is essential to our understanding of the properties and behaviour of different elements.	This learning builds on earlier study of the particle model of matter and the introduction to atoms and elements in in Year 7 and at the start of year 9. Knowledge of atomic structure is essential when you study topic C2 Structure and bonding and the process of electrolysis in unit C4 Chemical Changes.

Periodic	To explain the	Through teacher	The Periodic Table links	Builds on prior
Table	difference	input and	to atomic structure and	knowledge of atoms
	between metals	demonstration.	provides chemists with	and elements and
	and non-metals in		a structured	links how reactions o
	terms of atomic	Through using	organisation of all the	elements are related
	structure	models and	known elements	to their electronic
		diagrams to	providing information	structure
	How the periodic	represent ideas	on their physical and	
	table has changed over time	about atoms.	chemical properties.	Knowledge of the elements in different
		Through practical	Explains how testing a	groups of the periodi
	How to use the	work testing the	prediction can support	table is needed to
	Periodic Table to	reactivity of	or refute a new	help explain the
	explain chemical	different metals.	scientific idea.	chemical reactions
	properties and patterns in	Through		and processes such as reactions of metals
	reactivity through	independent		and electrolysis
	study of different	learning and		studied in the GCSE
	groups of	research.		course
	elements.	Through the		
		making and use of		
		revision resources		
		to conclude the		
		topic.		
Year 9 – Term	3		I	
latar da etica	The basis	Thursda to school	To be on the second be	The bounding to sig
Introduction	The basic information about	Through teacher input and	To know how the properties of different	The bonding topic builds on the periodic
<u>to bonding</u>	the three different	demonstration.	elements and	table and the
	types of bonding		compounds are the	electronic structure
	and structures	Through using	related to their	that students have
	found in elements	models and	structure and why we	studied in Year 9.
	and compounds.	diagrams to	use them for certain	
		represent ideas.	uses.	To prepare you for a
	An initial look at the			deeper understanding
		Ducomporing	To appreciate how	of this topic when you
	properties that	By comparing		
	these different	different	scientists can use this	study unit C2b in yea
	these different substances have	different structures and	knowledge to engineer	10 which relates
	these different substances have and how their	different structures and how they relate	knowledge to engineer new materials with	10 which relates bonding and structur
	these different substances have	different structures and	knowledge to engineer new materials with desirable properties and for use in different	10 which relates
	these different substances have and how their structure is related	different structures and how they relate	knowledge to engineer new materials with desirable properties	10 which relates bonding and structur to properties of materials. Cross-curricular links
	these different substances have and how their structure is related	different structures and how they relate	knowledge to engineer new materials with desirable properties and for use in different	10 which relates bonding and structur to properties of materials.

Chemistry of the atmosphereHow the atmosphere has developed over time and why these changes have taken place.Through group and classTo appreciate that the Earth's atmosphere is dynamic and forever the Chamigand the Chemistry of the atmosphere and how this can tell us information aboutThis topic will buil the work done in' atmosphere, the greenhouse greenhouse gases, how human activity impact these and how this leads to global climate change.Through idependent these and how this application of used to help predict weather and climate change.This topic also link the GCSE Organic Chemistry topic looking at the combustion of fos fuels.This topic also link the GCSE Organic Chemistry topic looking at the combustion of fos fuels.What is meant by carbon footprint and how to reduce it.What is meant by carbon footprint and how to reduce it.To know leg models of models of models of structuresTo know how the properties of different elements and compounds.To know how the properties and turutures and different structures and models of bonding and structures found in elements and compounds.By looking at models of structures and different structures and different structures and different structures and different structures and different structures and compounds.To keep and the structures and compounds.The build on knowledge of the structures and compounds.The build on knowledge of the structures and uses.The build on knowledge of the eexplain where the eexplain where the related to theirThe build on kn	ear
atmospheredeveloped over time and why these changes have taken place.discussion and debate.dynamic and forever changing.8 on the Earth's atmosphere, the greenhouse effect global warming.About greenhouse gases, how human activity impact these and how this leads to global climate change.Through independent independent atmosphere and how this can tell us application of used to help predict weather and climate change.8 on the Earth's atmosphere, the greenhouse effect global warming.What is meant by carbon footprint and how to reduce it.Through the applications of uestions.atmosphere and how this can tell us used to help predict weather and climate change.8 on the Earth's atmosphere, the greenhouse effect global warming.What is meant by carbon footprint and how to reduce it.Through the applications.atmosphere and how to reduce the impact on the environment and atmosphere and how to reduce the impact of human activity.Cross-curricular lin with Biology and Geography.Year 10 – Term 1To know how the properties of different elements and compounds.To know how the properties of different elements and compounds are the related to theirThe build on knowledge of the periodic table and electronic structureBonding and structuresBy comparing differentTo know how the properties of different elements and compounds.To know how the properties of different elements and compounds.To know how the periodic table and electronic structure	
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different use them for certain used to work out	
that these how they relate have come from.	
different their properties. To appreciate how	
substances have scientists can use this To gain an	
and how their By teacher knowledge to engineer understanding of	onic
structure is demonstration new materials with compounds and the	
related to their and discussion. desirable properties properties before	
properties. and for use in different learning about	
Through the technologies. electrolysis later in	
application of Year 10.	
TRIPLE ONLY knowledge to	
Students will learn exam style To prepare for the	
about questions. study of organic	
nanoparticles and Chemistry and	
their applications. polymers in Year 1	
	L.
	1.
As a basis for furth	1.
study of bonding a	
structure at A leve	er

Denstiens of	Depetienc of	Through planning	To dovelop prostical	To build on KC2
<u>Reactions of</u>	Reactions of	Through planning,	To develop practical	To build on KS3
<u>metals and</u>	metals with	risk assessing and	skills and	knowledge of acids,
<u>acids</u>	oxygen, water and	conducting	writing/following a	alkalis, indicators and
	acids.	practical	method for a multi-	the pH scale
		procedures.	stage practical	To solution denote a dia s
	How the reactivity		procedure.	To gain understanding
	series can be	Through learning	To man idea was site as	of chemical processes
	determined and	rules for chemical	To provides you with an	for high grade ores
	the impact this has on methods of	procedures and	understanding of how	before learning
	extraction.	using these to determine	chemical reactions have been used since the	alternate techniques
		observations and		for low grade ores in year 11.
	How to propare a	results for given	Bronze Age and Iron Age to make useful	year II.
	How to prepare a pure sample of a	chemicals.	substances from	
	soluble salt.	chemicais.	everyday resources.	
	Soluble Salt.	Through the	everyddy resources.	
	Equations and	application of	To know how everyday	
	observations	knowledge to	items can impact the	
	involving acids and	exam style	environment and	
	bases.	questions	economy.	
	50505.	involving	ceonomy.	
	Properties of acids	unfamiliar	To develop skills in	
	and the pH scale	contexts	safely carrying out	
	as a measure of		procedures including	
	acidity		conducting risk	
	,		assessments.	
Year 10 – Term	12			
Oursetitestics	The short and laws	Thursda was stical	To develop anotical	To source l'elete
<u>Quantitative</u> Chemistry	The physical law of conservation of	Through practical observations and	To develop practical skills and the use of	To consolidate chemistry
<u>Chemistry</u>	mass and how this	data analysis.	evidence to back up	understanding from
	would apply to	uala analysis.	predictions/conclusions.	year 9
	practical	Through practicing	predictions/conclusions.	year 5
	observations	calculations and	To gain an	To have a greater
	observations	stretch and	understanding of	understanding of
	The concept of	challenge applied	physical laws and basic	what the chemical
	moles and	questions.	laws of chemistry	equations met later in
	calculations	1	,	the course tell us
	involving moles	Through the	To make the link	
	and molar ratios.	application of	between observations	To provide knowledge
		knowledge to	and explanations.	and skills that will
	Calculations	exam style		help understanding of
	involving	questions	To gain the skills that	the rates topic
	concentrations	involving	will be applicable to	covered in year 11.
	and practice how	unfamiliar	many areas of the	
	to convert	contexts	course (and other	
	units/rearrange		sciences)	
1	annes/rearrange			
	equations			

	TRIPLE ONLY The concepts of efficiency, percentage yield and atom economy Titration calculations.			
Electrolysis	How the process of electrolysis can be used to extract metals. How to represent the reactions involved in electrolysis using half equations. How the important metal aluminium is extracted using electrolysis.	Through teacher input and modelling. Through learning rules for chemical procedures and using these to predict the products of a reaction. Through context- based tasks.	To appreciate the processes needed to obtain raw materials from natural resources.	This unit will build on concepts learned in the bonding topic such as forming ions and properties of ionic solutions.
Year 10 – Term	3			
<u>Energy</u> <u>Changes</u>	How some chemical reactions release or remove thermal energy. To represent energy changes in a reaction by diagrams. To calculate the energy changes in a reaction. TRIPLE ONLY How cells and batteries work. How hydrogen fuel cells work and to evaluate their use.	Through teacher input and demonstration. Through practical observations and data analysis. Through independent learning and research. Through the application of knowledge to exam style questions. Through group and class discussion and debate.	To appreciate that energy changes are an important part of chemical reactions. To recognise that interactions between particles can produce heating or cooling effects that are used in a range of everyday applications. To appreciate that some chemical reactions result in the production of electricity and that cells and batteries use these reactions.	This topic builds on the concept of moles from Quantitative Chemistry and develops the Chemical changes topic to look at the energy changes involved. This topic also links to the Rates of Reaction topic looking at how catalysts lower the energy needed for a reaction and to the Quantitative Chemistry topic The ideas involved are developed even further at A level.

<u>Rates of</u> <u>reaction</u> <u>Part 1</u>	Collision theory and how this can explain experimental data/observations. How changing temperature, concentration, surface area and adding a catalyst can change rate of reaction. The significance of controlling variables in order to provide valid results.	Through modelling of key scientific ideas Through planning and execution of practical work. Through observing teacher demonstrations.	To appreciate that in addition to reactivity of chemicals changing variables can speed up or slow down a reaction. To develop skills of scientific enquiry (making and testing predictions) To be able to plan and carry out robust scientific investigations using a range of variables.	To extend practical skills learned over the year 10 course. To apply knowledge of how science works when planning and carrying out own practical procedures. This unit provides you with an understanding of collision theory and how rate can be changed so that you can build on this in year 11 when using graphs to measure and describe rate .
Year 11 – Term	1			
<u>Rates of</u> <u>reaction</u> <u>Part 2</u>	The different ways rate can be measured and practice significance of units in equations. How graphs can be used to clearly represent data and aid in making conclusions. Examples of reversible reactions and the state of dynamic equilibrium. TRIPLE ONLY Equillibria and Le chateliers principle and how this can be applied to industrial process (Haber process)	Through modelling of key scientific ideas Through interpreting and drawing conclusions from own and given practical data. Through groupwork and class discussion when presented with "how science works" problems By applying new knowledge and techniques to unfamiliar situations in exam style questions	To gain an understanding of how changes to procedures can affect results and how chemists in industry make changes to optimise a process. To apply skills learned in maths and build on ks3 graphs and HSW skills.	This follows the study of collision theory as students are expected to use this knowledge to explain the changes to rate that take place during a reaction. You should have now studied gradients and tangents (higher students) in maths. assessing any given information

Organia	How different	Through toochor	To approxiate that the	This tonic builds on
<u>Organic</u>		Through teacher	To appreciate that the	This topic builds on
<u>Chemistry</u>	substances are	input and	main sources of organic	the Year 8 topic The
	separated from	demonstration.	compounds are fossil	Atmosphere and
	crude oil and what		fuels which are a major	extends the concept
	these substances	Through practical	resource for the	of covalent bonding
	are used for.	observations and	petrochemical industry	and polymers from
		data analysis.		the GCSE C2 Structure
	The products		To develop an	and Bonding topic.
	formed from	Through	understanding of how	
	burning fuels and	independent	chemists can modify	This topic also links to
	the consequences	learning and	organic molecules to	the GCSE C9
	to our	research.	make new and useful	Chemistry of the
	atmosphere.		materials	Atmosphere topic
		Through the		looking at the
		application of		products and
		knowledge to		consequences of
	TRIPLE ONLY	exam style		burning fossil fuels.
	Reactions of	questions.		
	organic molecules			The ideas involved are
	and how these can			the basis for a large
	be used.			part of the A level
				course.
	How polymers,			
	proteins and DNA			
	are formed			
Year 11 – Term	2			
Chemical	The difference	Through teacher	Analysis is a key area of	This topic builds on
Analysis	between pure	input and	Chemistry and there are	the tests for gases
<u></u>	substances,	demonstration.	many tests and	learned in Year 8 and
	mixtures and		techniques that can be	the Separating
	formulations and	Through practical	used to identify,	Mixtures section of
	how formulations	observations and	measure and test the	the Year 9 topic Basic
	are used in	data analysis.	purity of unknown	Chemistry
	everyday life.		substances.	chemistry
		Through		This topic also links to
	More about	independent	To develop an	the and GCSE C1 topic
	chromatography	learning and	understanding of how	Atomic Structure and
	and using it to	research.	instrumental analysis	to electrolysis studied
	identify unknown		can be used for many	in C4 Chemical
	substances.	Through the	applications and why it	Changes.
		application of	is so widely used.	
	Why instrumental	knowledge to		The ideas involved are
	analytical	exam style		developed further in
	methods are	questions.		the A level Chemistry
	particularly useful.			course
	TRIPLE ONLY			
	A wider range of			
	tests and			
	techniques.			
	Flame emission			
1				
	spectroscopy.			

Topia 10: Hair	\A/hat was a surray	Thursda to a share		This huilds are the
<u>Topic 10: Using</u>	What resources	Through teacher	To understand the	This builds on the
<u>Resources</u>	humans use and	demonstration	importance of	work done in Year 7
	the need for	and analysing	sustainable development	and Year 9 on
	sustainable	data from	and the Earth's	separating mixtures
	development.	investigations	resources and the role	and Year 8 looking at
		into water	Chemistry plays in this.	resources and waste.
	How to carry out	samples.		
	life cycle		To know how the water	It also builds on the
	assessments.	Through	you drink is produced,	C4 Chemical Changes
		independent	and how waste water is	GCSE topic looking at
	How the water	research.	treated.	alternative methods
	we drink is			of extracting metals.
	produced and	Through carrying	To know how the use of	_
	the treatment of	out life cycle	resources can affect the	For triple students this
	waste water.	assessments of	environment and how	links to the GCSE C6
		products.	human activity impact	topic looking at
	Higher tier	[this.	reversible reactions
	students learn	Through the		and the Haber
	about the	application of	The importance the	process.
	alternative	knowledge to	Haber process and	process.
	methods to	exam style	fertilisers in agriculture.	Cross-curricular links
	extract metals.	questions.	Ter thisers in agriculture.	
	extract metals.	questions.		to Geography.
	TRIPLE ONLY			
	-			
	Students will			
	learn about			
	other useful			
	materials, the			
	Haber process			
	and NPK			
	fertilisers.			