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		l		I
Y9 Cells	The structure of prokaryotic and eukaryotic cells including plant, animal and bacterial cells Explain how the structure of different types of cell relates to their functions To understand how substances	Through independent learning and enquiry Through the application of new knowledge and skills to unfamiliar contexts in exam style questions Through the use of scientific modelling	To understand the importance of different types of cells in organisms To appreciate how surface area to volume ratio affects rate of diffusion and impacts on organisms To be able to work safely	This unit will build on your knowledge of cells from Year 7 and introduce you to new cell structures and cell types. The use of microscopes will directly link to work you will do in year 10 looking at these in more depth Students who go onto A- Level Biology will further
	enter and leave cells and to calculate surface area to volume ratios To safely use a microscope to magnify and focus images of cells	Through practical based work to investigate and observe the structure of cells using microscopes and work safely.	preparing and using Biology samples and microscopes.	explore the structure of cells
Y9 Photosynthesis	You will learn what photosynthesis is and factors that affect it. You will carry out an investigation into the effect of	Through class discussion and debate. Through investigating how light intensity affects the rate of photosynthesis	To develop a deeper knowledge and understanding of the importance of the survival and existence of plants to support animals.	You will build upon your work in KS2 and begin to use more advanced terminology. In this topic you will build on the work you did in year 8 and now start to look at what
	one of these factors on the rate of photosynthesis. You will look at the uses of glucose in plants and the importance of using	Through context based tasks. Through independent research and enquiry.		factors affect the rate of photosynthesis and investigate how this can be measured. Photosynthesis is an important chemical reaction that is carried out by plants. Understanding this

	greenhouses to			process will help you in
	enhance profit.			future learning, it is revisited all the way up to A level!
Year 9 – Term 2		I	I	<u> </u>
Y9 Ecology	How everything in an environment is linked to form ecosystems How organisms are designed to survive in different conditions How to investigate the abundance and distribution of organisms	Through independent learning and enquiry Through the use of scientific modelling Through investigative work to gather data to support a hypothesis Through the application of new knowledge and skills to unfamiliar contexts in exam style questions	The idea of interdependence is crucial in the current climate emergency. Students can appreciate the impact of their actions on the wider environment To promote interest and curiosity in the variety of life on our planet To further develop investigative skills to collect accurate and valid data	Builds on prior knowledge of food webs and adaptations at KS2 with a focus now on explaining the patterns and knowledge Sampling investigations are required practical work which are examined on the GCSE assessments Students who go onto A- Level Biology will apply these sampling techniques in field work Cross curricular links to geography and the impacts of organisms on their environment and vice versa
Year 9 – Term 3				
Y9 Environmental change	How human population growth and actions impact on biodiversity. How loss of biodiversity and global warming are linked	Through enquiry and comprehension. Through class discussion and debate. Through context based tasks. Through analysis of data and evaluation.	To develop scientific literacy specific to our changing planet and the impact humans are having. To evaluate individual and society pressures on the environment.	Building on work done on global warming in year 8 topic Gas tests and environmental problems, including global warming. Relates to Year 10 work on food security and biodiversity and year 11 work on natural and artificial selection in relation to food security.

Year 10 – Term 2	1			
Y10 Plants	You will learn the main tissues of a plant and how they are adapted for their job. You will learn how changing the effects of environmental conditions affects the rate of transpiration. You will learn how to calculate inverse square law.	Through class discussion and debate. Through investigating how changing conditions affects the rate of water loss. Through planning your own investigations, analysing data and drawing conclusions.	To develop a deeper knowledge and understanding of the importance of plants and how they are affected by environmental conditions. To be able to plan scientific investigations and alternative experiments. To make valid conclusions	You will build upon your work in KS2 and KS3 on plant structure and begin to use more advanced terminology. In this topic you will build on the work you did in year 9 on the principles of organisation and photosynthesis and now start to look at how plants are affected by environmental conditions through practical investigations.
		Through analysing and interpreting alternative experiments. Through context based tasks.		Plants play a fundamental role in our existence. Understanding their importance allows us to make links between organisms on earth. This is developed further at A level.
<u>Y10 – Infection</u> <u>and Response</u>	You will study a variety of Pathogens and the diseases that they can cause and explain how we can prevent the spread of pathogens. You will look at the defences that some organisms	Through group work and independent study. Through teacher led discussion and demonstration Through data analysis and interpretation.	To appreciate the threat to our health that pathogens can pose. To be able to evaluate the global use of vaccines to prevent disease	In this topic you will be building on your understanding of Cells from KS3 This unit provides you with the understanding of communicable disease so that you can build on this in later units when looking at Non-communicable disease.
	use against disease and the role the immune system plays. You will look at the discovery and development of	Through scenario- based learning Through evaluation of disease control methods	To appreciate the importance of Scientific methodology in Drug development and the key role Peer review plays in	You will be building on your knowledge of Plants and Photosynthesis by looking at plant diseases and how these effect plants. (Separate Only)

Digestion	drugs including vaccinations and how vaccines can help to provide immunity. You will study a variety of plant diseases and plant defences(Separate Science only) The role and importance of enzymes and other chemicals in the digestive system How enzymes work and what factors can affect their activity The chemical tests for different biological molecules contained within food	Through independent learning and enquiry Through the use of scientific modelling Through investigative work to gather data and write a scientific conclusion and identify variables	research in the Scientific community. Consider some Scientific career choices Consider the ethical and moral implications of vaccination To be able to explain how the digestive system works including the role of enzymes To be able to carry out practical investigations and assess safety risks To make valid conclusions.	You will build upon your work in Year 8 and enhance your understanding of how food is digested. Understanding the importance of food in the body will help you understand how this links to the process of respiration which will be studied later in year 10
<u>Year 10 – Heart</u> <u>and Lungs</u>	The structure of the heart and lungs including how they are designed to do their job The causes and treatments of coronary heart disease The cause and risk factors associated with cancer	Through dissection of animal anatomy to see key structures Through independent research and enquiry Through the application of knowledge to exam style questions involving	For students to gain an understanding of how their own bodies function and promote their curiosity So that students evaluate the risks that their life choices can have on their future health To build upon their existing knowledge of	Builds on Y7 knowledge of the functions of organs and systems by exploring how they do their jobs This builds on Year 9 knowledge of how multicellular organisms are built Analysis of data linked to non-communicable disease is a key skill which is transferable across all science and is essential for the assessment

		unfamiliar contexts Through the use of stories about the impacts of disease and treatments on the lives of real people	organ functions by exploring their unique designs	
Year 10 – Term 2	<u>.</u>			
<u>Year 10 –</u> <u>Respiration</u>	The different types of respiration that can be used to release energy How respiration of yeast is useful in baking and brewing The changes in the body in response to exercise	Through independent research and enquiry Through looking at case studies of the use of yeast in industry Through carrying out an investigation to test a hypothesis	To relate a fundamental chemical reaction to everyday lives To deepen student understanding of how their own bodies work To be able to carry out an investigation and assess issues with the accuracy and validity of data	Respiration as a life process is introduced at KS2 and misconceptions that confuse it with breathing are addressed at KS3. Now we seek to deepen understanding of how the process is carried out Builds on Y9 knowledge of cell parts and specialised cells This follows the topic on heart and lungs as we would expect students to be able to use this knowledge to explain the changes that take place during exercise

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Environmentthe environment.Researchthe human species on Earth relies on us maintaining a good level of biodiversity.biodiversity and the environment from Year 9Factors affecting food security and ways to increase Food production.Through class discussion and debaterelies on us maintaining a good level of biodiversity.He human environment from Year 9Through comparing different types of farmingTo help students make informed decisions aboutHe human environment from Year 9			e . ,		
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farming decisions about					
how they treat			farming		
the environment				the environment	
	1	1	1	1	1

Varia 44	The start 1	Thursday	Ta male of a lot	
Year 11 –	The structure and	Through	To understand the	In KS3 students are
Coordination	function of the	modelling and	importance of	introduced to the idea of
and control	human nervous	comprehension.	coordination to	systems that control
part 1.	system.		survival.	functions of the body
		By investigation.		and the organs and
	The structure and		Develop	tissues involved.
	function of the	Through	knowledge and	
	Brain (Separate	interpretation and	understanding of	At Y9 students develop a
	only)	analysis.	how the body	more thorough
			adapts and	understanding of cell
	The structure and	Through enquiry,	controls to a	specialisms and their
	function of the	comprehension	variety of	function.
	eye (Separate	and discussion.	circumstances.	
	only)			At Y10 students are
			To develop	introduced to the idea of
	The structure and		scientific literacy	systems being
	function of the		through	complimentary and
	human endocrine		understanding of	coordinated.
	system.		investigation	
			process.	Students who go on to
	The control of			A-Level will investigate
	blood glucose and			further the complexities
	development of			of this control including
	diabetes.			how it should be self-
				moderating through
				negative feedback.
Year 11 – Term 1	-			
Year 11	You will look at	Through analysis	To be able to	Here you will build on
Co-ordination	the Menstrual	and interpretation	understand the	your understanding of
and control	cycle and	of data and	importance of	Hormones from earlier
Part 2	methods of	graphs.	being able to	in this topic.
10112	increasing and	graphs.	control fertility.	in this topic.
	decreasing	Through	control tertinty.	This unit will give you an
	fertility	evaluation of	To be able to	understanding of how
	(Contraception	different	consider the	hormones are important
	and IVF)	techniques and	advantages and	in Reproduction which is
		processes.	disadvantages of	visited in later units.
	You will consider	processes.	a range of	visited in later drifts.
	the ways in which	Through	methods of	You will be able to build
		discussion and		
	the body controls		fertility control.	on your understanding
	its internal	debate.	To consider the	of plants and
	environment.	The second second second	To consider the	photosynthesis and look
	(Separate only)	Through practical	ethical and moral	at how plants can
		demonstration	implications of IVF	respond to the changes
	You will look at	and investigation.	and	in their environment to
	hormonal co-		Contraception	maximise
	ordination in		methods.	photosynthesis.
	Plants. (Separate			(Separate Only)
	only)	1	1	

			To understand how we can use hormones to our advantage in plants and animals and the implications this has. To be able to plan and carry out robust scientific investigations using a range of variables.	
Year 11 - Reproduction and Inheritance	How DNA stores the instructions for life How the DNA code is read (Triple Only) How cell division is important for different types of reproduction How to predict the characteristics of offspring based on inherited genes The cause and treatments of a range of genetic diseases	Through modelling of key scientific ideas Through independent research and enquiry Through practical examples of genetic crosses using real world and imaginative scenarios By applying new knowledge and techniques to unfamiliar situations in exam style questions	To deepen student understanding of how characteristics can be passed down through families To consider the ethical implications of reproducing To be able to apply new skills to unfamiliar contexts which are likely to be used in assessments	In KS3 students are introduced to the idea of inherited variation. This topic builds on that and explains why there is no certainty in predicting the characteristics that children will inherit At Y10 students are introduced to one kind of cell division, here we introduce a different type which they will make comparisons with Students who go on to A-Level will explore more complex ways of using the skills in this topic Opportunity for evaluation of information comes up again in this topic, a skill crucial when assessing any given information

Year 11 –	You will learn why	Through the	To appreciate the	Students will build on
Evolution and	there is so much	modelling of key	origin of the	KS3 knowledge of
Variation	variety to be	scientific ideas in	universe and life	inherited variation and
	found in the living	class practicals.	on this planet.	how this leads to
	world.		•	evolution.
		Through	To deepen	
	You will learn	independent	student	Evolution is the
	how natural	research and	understanding of	paradigm which
	selection leads to	enquiry.	the scientific	underpins all biological
	the evolution of		method and the	theory. As such,
	new species.	Through	processes of	understanding the
		examining	scientific	processes of natural
	You will learn	skeletons and	discovery.	selection are key to the
	how scientific	fossils.		future study of biology
	theories are able		To be able to	and psychology, at A-
	to evolve as new	By applying new	apply scientific	level and beyond.
	evidence is found.	knowledge and	concepts to real	
		techniques to	world problems	Understanding the
	You will discover	unfamiliar	such as the	strengths of the
	the factors that	situations in exam	implications of	scientific method and
	result in	style questions	climates change	the fact that science can
	extinction.		and antibiotic	"change its mind" is key
			usage.	to understanding
	You will learn			science. This is
	how to classify different			particularly relevant to scientific discoveries and
	organisms.			medical advice in the media.
Y11 Artificial	Artificial selection	Through Enquiry	To develop an	This unit will build on
Selection and	through	and Independent	understanding of	your knowledge of
Gene	Selective	Research	the important role	reproduction in Year 7
Technology	breeding		of biotechnology	and natural selection in
	Genetic	Through class	in modern society.	year 11.
	engineering and	discussion and	-	
	Cloning	debate	To consider the	
			ethical	
		Through	implications of	
		evaluation of	cloning and gene	
		different	technology.	
		techniques		
			To be able to	
		Through	develop an	
		comparing	informed opinion	
		different types of	on the role	
		cloning	cloning and gene	
			technology could	
			play in the future of the human	
			race.	