

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

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

Year 10 – Term 1

<p><i>Y10 Plants</i></p>	<p>You will learn the main tissues of a plant and how they are adapted for their job.</p> <p>You will learn how changing the effects of environmental conditions affects the rate of transpiration.</p> <p>You will learn how to calculate inverse square law.</p>	<p>Through class discussion and debate.</p> <p>Through investigating how changing conditions affects the rate of water loss.</p> <p>Through planning your own investigations, analysing data and drawing conclusions.</p> <p>Through analysing and interpreting alternative experiments.</p> <p>Through context based tasks.</p>	<p>To develop a deeper knowledge and understanding of the importance of plants and how they are affected by environmental conditions.</p> <p>To be able to plan scientific investigations and alternative experiments.</p> <p>To make valid conclusions</p>	<p>You will build upon your work in KS2 and KS3 on plant structure and begin to use more advanced terminology.</p> <p>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.</p> <p>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.</p>
<p><u><i>Y10 – Infection and Response</i></u></p>	<p>You will study a variety of Pathogens and the diseases that they can cause and explain how we can prevent the spread of pathogens.</p> <p>You will look at the defences that some organisms use against disease and the role the immune system plays.</p> <p>You will look at the discovery and development of</p>	<p>Through group work and independent study.</p> <p>Through teacher led discussion and demonstration</p> <p>Through data analysis and interpretation.</p> <p>Through scenario-based learning</p> <p>Through evaluation of disease control methods</p>	<p>To appreciate the threat to our health that pathogens can pose.</p> <p>To be able to evaluate the global use of vaccines to prevent disease</p> <p>To appreciate the importance of Scientific methodology in Drug development and the key role Peer review plays in</p>	<p>In this topic you will be building on your understanding of Cells from KS3</p> <p>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.</p> <p>You will be building on your knowledge of Plants and Photosynthesis by looking at plant diseases and how these effect plants. (Separate Only)</p>

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

		<p>unfamiliar contexts</p> <p>Through the use of stories about the impacts of disease and treatments on the lives of real people</p>	<p>organ functions by exploring their unique designs</p>	
Year 10 – Term 2				
<p><u>Year 10 – Respiration</u></p>	<p>The different types of respiration that can be used to release energy</p> <p>How respiration of yeast is useful in baking and brewing</p> <p>The changes in the body in response to exercise</p>	<p>Through independent research and enquiry</p> <p>Through looking at case studies of the use of yeast in industry</p> <p>Through carrying out an investigation to test a hypothesis</p>	<p>To relate a fundamental chemical reaction to everyday lives</p> <p>To deepen student understanding of how their own bodies work</p> <p>To be able to carry out an investigation and assess issues with the accuracy and validity of data</p>	<p>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</p> <p>Builds on Y9 knowledge of cell parts and specialised cells</p> <p>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</p>

<p><i>Y10 Microscopy &amp; Cells</i></p>	<p>You will learn how to examine cell structure using a light microscope.</p> <p>You will learn how the relative merits of different types of microscope.</p> <p>You will learn how different substances enter cells.</p> <p>You will learn about the cell cycle and how cells reproduce and develop.</p>	<p>Through creating and examining your own specimens.</p> <p>Through comparing the merits of different technologies.</p> <p>Through planning and conducting experiments.</p> <p>Through analysing your own data and interpreting alternative experiments.</p> <p>Through watching animations and models to visualise microscopic processes.</p>	<p>To develop a deeper understanding of how advances in technology have led to advances in understanding.</p> <p>To be able to plan scientific investigations and alternative experiments.</p> <p>To make valid conclusions.</p> <p>To understand key processes within living organisms and to have a more complete understanding of our own bodies and development.</p>	<p>In this topic you will build upon your KS3 knowledge of cell structure and the use of microscopes.</p> <p>You will build on your KS3 knowledge of diffusion and apply it to the concept of osmosis.</p> <p>Understanding osmosis is key to understanding several processes in living organisms, such as the effects of certain drugs, diet and diabetes on the human body.</p> <p>Stem cells and the cell cycle are key to knowing how humans develop from embryos and can be applied to the understanding of cancer and other cutting-edge medical research.</p>
<p>Year 10 – Term 3</p>				
<p><i>Y10 Human Impact on the Environment</i></p>	<p>The impact humans have on the environment.</p> <p>Factors affecting food security and ways to increase Food production.</p>	<p>Through Enquiry and Independent Research</p> <p>Through class discussion and debate</p> <p>Through comparing different types of farming</p>	<p>To understand how the future of the human species on Earth relies on us maintaining a good level of biodiversity.</p> <p>To help students make informed decisions about how they treat the environment</p>	<p>This unit will build on your knowledge of biodiversity and the environment from Year 9</p>

<p><i>Year 11 – Coordination and control part 1.</i></p>	<p>The structure and function of the human nervous system.</p> <p>The structure and function of the Brain (Separate only)</p> <p>The structure and function of the eye (Separate only)</p> <p>The structure and function of the human endocrine system.</p> <p>The control of blood glucose and development of diabetes.</p>	<p>Through modelling and comprehension.</p> <p>By investigation.</p> <p>Through interpretation and analysis.</p> <p>Through enquiry, comprehension and discussion.</p>	<p>To understand the importance of coordination to survival.</p> <p>Develop knowledge and understanding of how the body adapts and controls to a variety of circumstances.</p> <p>To develop scientific literacy through understanding of investigation process.</p>	<p>In KS3 students are introduced to the idea of systems that control functions of the body and the organs and tissues involved.</p> <p>At Y9 students develop a more thorough understanding of cell specialisms and their function.</p> <p>At Y10 students are introduced to the idea of systems being complimentary and coordinated.</p> <p>Students who go on to A-Level will investigate further the complexities of this control including how it should be self-moderating through negative feedback.</p>
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Year 11 – Term 1

<p><i>Year 11 Co-ordination and control Part 2</i></p>	<p>You will look at the Menstrual cycle and methods of increasing and decreasing fertility (Contraception and IVF)</p> <p>You will consider the ways in which the body controls its internal environment. (Separate only)</p> <p>You will look at hormonal co-ordination in Plants. (Separate only)</p>	<p>Through analysis and interpretation of data and graphs.</p> <p>Through evaluation of different techniques and processes.</p> <p>Through discussion and debate.</p> <p>Through practical demonstration and investigation.</p>	<p>To be able to understand the importance of being able to control fertility.</p> <p>To be able to consider the advantages and disadvantages of a range of methods of fertility control.</p> <p>To consider the ethical and moral implications of IVF and Contraception methods.</p>	<p>Here you will build on your understanding of Hormones from earlier in this topic.</p> <p>This unit will give you an understanding of how hormones are important in Reproduction which is visited in later units.</p> <p>You will be able to build on your understanding of plants and photosynthesis and look at how plants can respond to the changes in their environment to maximise photosynthesis. (Separate Only)</p>
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<i>Year 11 - Reproduction and Inheritance</i>	<p>How DNA stores the instructions for life</p> <p>How the DNA code is read (Triple Only)</p> <p>How cell division is important for different types of reproduction</p> <p>How to predict the characteristics of offspring based on inherited genes</p> <p>The cause and treatments of a range of genetic diseases</p>	<p>Through modelling of key scientific ideas</p> <p>Through independent research and enquiry</p> <p>Through practical examples of genetic crosses using real world and imaginative scenarios</p> <p>By applying new knowledge and techniques to unfamiliar situations in exam style questions</p>	<p>To deepen student understanding of how characteristics can be passed down through families</p> <p>To consider the ethical implications of reproducing</p> <p>To be able to apply new skills to unfamiliar contexts which are likely to be used in assessments</p>	<p>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</p> <p>At Y10 students are introduced to one kind of cell division, here we introduce a different type which they will make comparisons with</p> <p>Students who go on to A-Level will explore more complex ways of using the skills in this topic</p> <p>Opportunity for evaluation of information comes up again in this topic, a skill crucial when assessing any given information</p>
Year 11 – Term 3				



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