

## Year 9 Biology Curriculum

Students follow the Ark Curriculum + Science Mastery Scheme which is a 5 year programme of study commencing in year 7 and aligns to the AQA Exam board for final assessment in year 11. This is the first year that the course has been run, therefore some of the content for the Science Mastery topics has been covered previously. The content currently taught is identified in the sequence column. The switch to Science Mastery took place after the half term break in October.

Students either follow the combined science course or the separate 'triple' science course. Content that is separate science only is marked in bold as 'triple only'.

Unit:	Core knowledge/skill development:	Sequence:	Assessment:	Literacy, numeracy, PSHE, FBV, other links	Key areas of ACP and VAA development:	Home learning and enrichment
9B Plant nutrients	This topic introduces the concept of photosynthesis and the reactants/ products involved	9Ba Reactions in plants 9Bb Plant adaptations 9Bc Plant products 9Bd Growing crops 9Be Farming problems	Starter questions  Exam-type questions  Hinge questions  Use of web-based applications to assess knowledge in lesson (e.g. Educake, Seneca, Active Learn etc.)  There is a Working Scientifically opportunity looking at decimal places and significant figures.	Literacy: key words, definitions, summary notes.	<b>Connection finding (linking)</b> to use connections, to generalise the abstract concept of particle theory, energy released in reactions and reactivity  <b>Analysing</b>  Determining whether a reaction would go ahead based on the reactivity of the reactants, whether a reaction would be exothermic or endothermic	Homework typically set on Seneca  Exam preparation via exam / test papers.

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			End-of-topic tests.			
Switch to Ark Curriculum+ Science Mastery Course. Pearsons Active Learn and Science Mastery course were cross referenced to ensure all curriculum content was covered. This resulted in some Science Mastery topics being slightly shorter in length as the content may have already been covered.						
<b>B3.1 Growth and Differentiation</b>	In this unit, pupils will explore cell structure, classification (eukaryotic vs. prokaryotic), and sub-cellular functions. They'll use microscopes to study cells, including electron microscopes for more detail, and investigate bacterial growth with aseptic techniques. Pupils will also learn about cell transport methods (diffusion, osmosis, active transport) and how cells adapt for efficient exchange. The unit covers cell specialisation, mitosis for growth and repair, and introduces cancer as a result of	Before this unit, pupils will know that cells are the building blocks of life and will have studied basic animal and plant cell structures, specialised cells, organ systems, and cellular processes like respiration and photosynthesis. They will also be aware of cancer, its link to lifestyle choices, and the diffusion of particles in gases. In this unit, pupils will revisit cell structure, classify cells as eukaryotic or prokaryotic, and practice experimental techniques like microscopy and aseptic methods for growing bacteria. They'll learn about the	Pre-knowledge quiz MCQ End of topic test	Literacy: key words, definitions, summary notes.  Numeracy: summary notes, equation practice,  General maths skills (e.g. rearranging equations, graph plotting, standards form, SI prefixes)  Equations students are required to recall and apply and which they are required to select from a list and apply	<b>Connection finding (linking)</b> to use connections, to find how subcellular structures are involved in the functioning of a cell  <b>Analysing</b> Determining which factors how certain substances are transported across the cell membrane  <b>Linking: abstract thinking</b> <b>Complex and multi-step problem solving</b> to break down a task to decide on a suitable approach, and then apply the knowledge. To understand how cells differentiate into cancerous cells  <b>Risk-taking</b>	Homework is set on Seneca. Cognito can be used to support at home learning

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	<p>uncontrolled cell growth. Pupils will also learn about stem cells and their use in disease research and treatment.</p>	<p>three methods of cell transport, the cell cycle, mitosis, and cancer. Pupils will also explore stem cells and their medical uses. This unit will strengthen their experimental skills and lay the foundation for advanced study of cellular processes, including meiosis, cell transport in animals and plants, and the ethical debates surrounding stem cells. At A-level, pupils will study cellular reactions, division, and nutrition in more depth, applying microscopy techniques and aseptic skills in various fields like medicine, forensic science, and pharmaceuticals.</p> <p>B3.1.1 Prior knowledge review</p>			<p>Being brave enough to work in unfamiliar contexts</p>	

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		B3.1.2. Eukaryotic and Prokaryotic Cells B3.1.3. Aseptic Technique B3.1.4. Growth of Bacteria B3.1.5. Microscopes B3.1.6. Observing Cells B3.1.7. Diffusion B3.1.8. Diffusion in Living Things B3.1.9. Osmosis B3.1.10. Osmosis Investigation B3.1.11. Active Transport B3.1.12. Cell Division B3.1.13. Cancer B3.1.14. Stem Cells				
<b>B3.2 Human Interaction (from Organisms are Interdependent)</b>	In this unit, pupils explore biodiversity and its importance for survival, understanding how human activities like pollution and habitat destruction reduce it. They learn global efforts to preserve biodiversity and use indicator species to	Pupils understand that environmental changes can endanger living things and have prior knowledge of ecosystems, competition, and abiotic/biotic factors from Y7. They are familiar with food chains, sampling techniques, and the	Pre-knowledge quiz MCQ End of topic test	Literacy: key words, definitions, summary notes.  Numeracy: summary notes, equation practice,  General maths skills (e.g. rearranging	<b>Connection finding (linking)</b> to use connections, to generalise the abstract concept of human interaction and its effects of biodiversity  <b>Analysing</b> Determining which factors (eg. abiotic and biotic factors) affect biodiversity	Homework is set on Seneca. Cognito can be used to support at home learning

Unit:	Core knowledge/skill development:	Sequence:	Assessment:	Literacy, numeracy, PSHE, FBV, other links	Key areas of ACP and VAA development:	Home learning and enrichment
	<p>monitor pollution. Pupils study energy transfer in food chains, pyramids of biomass, and threats to food security, considering solutions through initiatives and new technologies</p>	<p>impact of human activity on biodiversity and global warming. This unit deepens their understanding of pyramids of biomass and prepares them for future study of atmospheric gases, global warming, and sustainability, enabling responsible lifestyle choices</p> <p>B3.2.1. Prior Knowledge Review B3.2.2. Biodiversity B3.2.3. How Humans affect Biodiversity B3.2.4. How Humans can Preserve Biodiversity B3.2.5. The Effect of Pollution on Biodiversity B3.2.6. Global Warming B3.2.7. Taking it Further: Pyramids of Biomass (Biology only)</p>		<p>equations, graph plotting, standards form, SI prefixes)</p> <p>Equations students are required to recall and apply and which they are required to select from a list and apply.</p>	<p>and how interdependence is affected</p> <p><b>Linking: abstract thinking</b> <b>Complex and multi-step problem solving</b> to break down a task to decide on a suitable approach, and then apply the knowledge.</p> <p><b>Risk-taking</b> Being brave enough to work in unfamiliar contexts.</p>	

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		<p><b>B3.2.8. Taking it Further: Farming and Biotechnology (Biology only)</b>  <b>B3.2.9. Taking it Further: Food Security (Biology only)</b></p>				
<p><b>B3.3. Genetics</b></p>	<p>In this unit, students will learn about reproduction and how traits are inherited. They will study meiosis, which creates gametes, and explore the role of DNA in inheritance. The unit covers protein synthesis and how mutations affect proteins. Students will also learn about Mendelian inheritance, how alleles determine traits, and use Punnett squares and family trees to understand genetic disorders and inheritance patterns</p>	<p>In this unit, students will review mitosis and learn about meiosis, focusing on the different types of cell division in reproduction. They'll explore sexual and asexual reproduction, comparing their advantages and disadvantages. The unit covers the development of gene theory, key scientists like Mendel, Sutton, Watson, and Crick, and how genes and alleles determine traits. Students will use Punnett squares to predict inheritance and study inherited disorders like cystic</p>			<p><b>Connection finding (linking)</b> to use connections, to determine how DNA leads to inherited variation</p> <p><b>Analysing</b> Determining whether changes in the DNA sequence leads to certain inherited disease by looking at Punnett Squares and family trees</p> <p><b>Linking: abstract thinking</b> <b>Complex and multi-step problem solving</b> to break down a task, decide on a suitable approach, and then act. Example, determining the probability of a phenotype using the correct gametes and Punnett square</p>	

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		<p>fibrosis and polydactyly.</p> <p>In future units, students will learn about mutations, evolution, and genetic engineering. They'll explore non-communicable diseases and continue studying genetics, building a foundation for A-level biology.</p> <p>B3.3.1. Prior knowledge review                      B3.3.2. The Cell Cycle                      B3.3.3. Meiosis                      B3.3.4. Evaluating types of reproduction                      B3.3.5. The development of gene theory                      B3.3.6. Determining our characteristics: DNA, proteins and the environment                      B3.3.7. Determining our characteristics: Genes and Alleles</p>			<p><b>Risk-taking</b>                      Being brave enough to work in unfamiliar contexts.</p>	

Unit:	Core knowledge/skill development:	Sequence:	Assessment:	Literacy, numeracy, PSHE, FBV, other links	Key areas of ACP and VAA development:	Home learning and enrichment
		B3.3.8. Using punnett squares to predict characteristics B3.3.9. Inherited disorders B3.3.10. Sex determination <b>B3.3.11. Taking it further: DNA</b> <b>B3.3.12. Taking it further: Proteins</b>				