



Year 12: Biology

Curriculum Intent: Students follow the two-year OCR A-Level (A) Biology specification building on their existing knowledge from GCSE. In the early stages of the course, students are given a grounding in some of the basic skills they will need for the course. Pupils will then study Module 2: Foundations in Biology, Module 3: Exchange and transport and Module 4: Biodiversity, evolution and disease of the OCR specification form the majority of what is learnt, with key practical skills and techniques being developed alongside this. This consolidates the base knowledge needed to move onto more complex biological processes, genetics and biotechnology year 13. Some topics from Module 6: Ecosystems are also introduced towards the end of the year. Learning is supported by practical work and students will complete approximately 9 practical assessments (PAGs) during the year which count towards their final qualification. Students are taught by 2 teachers

	Module 2 Foundations in Biology	Module 3 Exchange and transport	Module 4 Biodiversity, evolution and disease	Module 6 Genetics and ecosystems
Key ideas	<ul style="list-style-type: none"> • Cell structure • Biological Membranes • Nucleic acids • Enzymes • Biological membranes • Cell division, cell diversity and cell differentiation. 	<ul style="list-style-type: none"> • Exchange surfaces and breathing • Transport in animals • Transport in plants 	<ul style="list-style-type: none"> • Communicable disease • Biodiversity • Classification and evolution 	<ul style="list-style-type: none"> • Ecosystems • Populations and sustainability
Sequence of Learning	<ul style="list-style-type: none"> • Microscopy, including practical work. • Study the ultrastructure of eukaryotic and prokaryotic cells. • Structure of the membrane and the role of membranes in transporting substances into / out of cells. • Mitosis and meiosis • Diversity in plant and animal cells • Plant and animal tissue, organs and organ systems. 	<ul style="list-style-type: none"> • Gas exchange surfaces in mammals and other organisms. • Function and structure of lung tissue. • Measuring lung volumes. • Transport in animals to include structure and function of the heart and blood vessels. • The cardiac cycle and the coordination of the cardiac cycle. • Transport of oxygen and carbon dioxide in the mammalian body. 	<ul style="list-style-type: none"> • Disease causing pathogens and their transmission. • Plant defences against pathogens. • Primary and secondary defences against disease. • Specific immune response. • Antibodies and vaccination. • The development and use of drugs. • Biodiversity, including the calculation of biodiversity and reasons to maintain biodiversity. • Conservation – <i>in situ</i> & <i>ex situ</i> 	<ul style="list-style-type: none"> • Ecosystems • Transfer of biomass through the ecosystem. • Recycling within ecosystems. • Succession • Studying ecosystems though sampling techniques. • Interactions between populations and the determination of population size. • Conservation and preservation. • Sustainable management.

	<ul style="list-style-type: none"> • Biological molecules, including carbohydrates, protein and lipids. • Practical biochemistry to include quantitative and qualitative tests for biological molecules. • Nucleic acids, DNA replication and protein synthesis. • Enzymes as biological catalysts and cofactors. • Factors affecting enzyme activity. • Enzyme inhibitors • PAGs are completed at various points throughout the course 	<ul style="list-style-type: none"> • Transport in plants through xylem and phloem. • Transpiration and translocation. • Adaptation of plants to water availability. • PAGs are completed at various points throughout the course 	<ul style="list-style-type: none"> • Classifications systems and phylogeny. • Natural selection, variation, adaptations, and evolution. • Evidence for natural selection. • Applying statistical techniques. • PAGs are completed at various points throughout the course 	
Vocabulary	The list of key words is too numerous for inclusion here. The recommended course textbook provides a complete Glossary of key words			
Practical Skills (relevant PAGs)	PAG 8.2 Osmosis through an artificial cell. PAG 8.1 Investigate osmosis in potato tissue PAG 5.1 Investigate the effect of temperature on transport across cell membranes in beetroot. PAG 5.2 Quantitative investigation of glucose concentration. PAG 4.3 Investigate the effect of temperature on enzyme activity.	PAG 2.1 Heart dissection PAG 5.3 Using a potometer to investigate transpiration rate.	PAG 1.2 Microscopy of a blood smear.	PAG 10.1 Use RasMol computer simulation to investigate the size of biological molecules.

<p>Assessment (Related to mastery grids)</p>	<p>Pupils will be assessed through the completions of exam style assessments / tests, practical work and other assignments at regular points throughout the course</p>	<p>Pupils will be assessed through the completions of exam style assessments / tests, practical work and other assignments at regular points throughout the course</p>	<p>Pupils will be assessed through the completions of exam style assessments / tests, practical work and other assignments at regular points throughout the course</p>	<p>Pupils will be assessed through the completions of exam style assessments / tests, practical work and other assignments at regular points throughout the course</p>
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