



Years 12 & 13 Curriculum

A Level: Biology



Year 12	Autumn Term 1 (Autumn)		Term 2 (Spring)	Term 3 (Summer)	
	Autumn 1 & 2	Autumn 2 & Spring 1	Spring 2 & Summer 1	Summer 2	
Topic	Module 2 Foundations in Biology	Module 3 Exchange & Transport	Module 4 Biodiversity, Evolution & Disease	Ecosystems, populations and sustainability	
Key Concepts	<ul style="list-style-type: none"> • Microscopy • Magnification and calibration • More microscopy • Eukaryotic cell structure • The ultrastructure of plant cells • Prokaryotic and eukaryotic cells • Biological elements • Water • Carbohydrates • Testing for carbohydrates • Lipids • The structure of proteins • Types of proteins • Nucleic acids • DNA replication and the genetic code • Protein synthesis • ATP • Enzyme action • Factors affecting enzymes • Enzyme inhibitors • Cofactors, coenzymes, and prosthetic groups • The structure and function of membranes • Factors affecting membrane structure • Diffusion • Active transport • Osmosis • Cell cycle • Mitosis • Meiosis • The organisation and specialised cells • Stem cells 	<ul style="list-style-type: none"> • Specialised exchange surfaces • The mammalian gaseous exchange system • Measuring the process • Ventilation and gas exchange in other organisms • Transport systems in multicellular animals • Blood vessels • Blood, tissue fluid, and lymph • Transport of oxygen and carbon dioxide in the blood • The heart • Transport systems in dicotyledonous plants • Water transport in multicellular plants • Transpiration • Translocation 	<ul style="list-style-type: none"> • Classification • The five kingdoms • Phylogeny • Evidence for evolution • Types of variation • Representing variation graphically • Adaptations • Changing population characteristics • Biodiversity • Types of sampling • Sampling techniques • Calculating biodiversity • Calculating genetic biodiversity • Factors affecting biodiversity • Reasons for maintaining biodiversity • Methods of maintaining biodiversity • Animal and plant pathogens • Animal and plant diseases • The transmission of communicable diseases • Plant defences against pathogens • Non-specific animal defences against pathway • The specific immune system • Preventing and treating disease 	<ul style="list-style-type: none"> • Ecosystems • Biomass transfer through an ecosystem • Recycling within ecosystems • Succession • Measuring the distribution and abundance of organisms • Population size • Competition • Predator-prey relationships • Conservation and preservation • Sustainability and ecosystem management 	



Years 12 & 13 Curriculum *(continued)*

A Level: Biology



Year 13	Term 1 (Autumn)	Term 2 (Spring)
	Autumn 1 & 2	Spring 1 & 2
Topic	Module 5 communication, homeostasis and energy	Module 6 Genetics, Evolution & Ecosystems
Key Concepts	<ul style="list-style-type: none"> • Respiration • Respiratory substrates • Energy cycles • Photosynthesis • Factors affecting photosynthesis • Coordination • Neurones • Sensory receptors • Nervous transmission • Synapses • Organisation of the nervous system • Structure and function of the brain • Reflexes • Voluntary and involuntary muscles • Sliding filament model • DNA profiling • DNA sequencing and analysis • Using DNA sequencing and analysis • Using DNA sequencing • Variation and inheritance • Monogenetic inheritance • Dihybrid inheritance • Phenotypic ratios • Evolution • Speciation and artificial selection • 	<ul style="list-style-type: none"> • Hormonal communication • Structure and function of the pancreas • Regulation of blood glucose concentration • Diabetes and its control • Coordinated responses • Controlling heart rate • The principles of homeostasis • Thermoregulation in ectotherms • Thermoregulation in endotherms • Excretion, homeostasis, and the liver • The structure and function of the mammalian kidney • The kidney and osmoregulation • Urine and diagnosis • Kidney failure • Genetic engineering • Gene technology and ethics • Natural cloning in plants • Artificial cloning in plants • Cloning in animals • Microorganisms, medicines and bioremediations • Culturing microorganisms in the laboratory • Culturing microorganisms on an industrial scale • Using immobilised enzymes • Mutations and variation • Control of gene expression • Body plans • Plant hormones and growth in plants • Plant responses to abiotic stress • Plant responses to herbivory • Tropisms in plants • The commercial use of plant hormones



Years 12 & 13 Assessment

A Level: Biology



All students will sit an assessment and a mock examination in Year 12 and two mock examinations in Year 13.

	Year 12		Year 13		Revision Resources
	Assessment	Mock Exam	Mock Exam	Mock Exam	
	Autumn Term 1	Summer Term	Autumn Term	Spring Term	
Style of Assessment	Short answers, multiple-choice and extended answer questions	Short answers, multiple-choice and extended answer questions	Short answers, multiple-choice and extended answer questions	Short answers, multiple-choice and extended answer questions	Kennet Resources <ul style="list-style-type: none"> • Core Questions • Knowledge Organisers • Learning Habits External Resources <ul style="list-style-type: none"> • www.physicsandmathstutor.com • www.kerboodle.com
Topics Assessed	<ul style="list-style-type: none"> • Module 1, chapter 2.1, 2.2, and 3.1 	<ul style="list-style-type: none"> • All AS content: Modules 1, 2, 3 and 4 • 	<ul style="list-style-type: none"> • All AS content: Modules 1, 2, 3 and 4 • A2 content chapter 17, 18 and 19 	<ul style="list-style-type: none"> • All topics covered in Year 12 and the following Year 13 chapters: 13, 14, 15, 17, 18, 19 and 20 • 	