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	• 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		• 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		• 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	• 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	• 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	• 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 herb ivory • 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		
	Assessment	**Mock Exam**	**Mock Exam**	**Mock Exam**	**Revision Resources**
	Autumn Term	**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	Written creative statement to support their coursework. Series of thumbnail studies to develop into a large-scale coursework outcome.	Short answers, multiple-choice and extended answer questions	*Kennet Resources* • Core Questions • Knowledge Organisers • Learning Habits *External Resources* • www.physicsandmathstutor.com • www.kerboodle.com You can also find additional revision material on Frog
Topics Assessed	• Basic components of living systems • Biological molecules • Enzymes • Plasma membranes • Cell division • Exchange surfaces and breathing • Transport in plants and animals • Classification and evolution • Biodiversity • Communicable diseases	• Basic components of living systems • Biological molecules • Enzymes • Plasma membranes • Cell division • Exchange surfaces and breathing • Classification and evolution	• The written statement should include how students' ideas have been reviewed and refined, showing how the artist research has informed their planning. This should also be evident in their thumbnail sketches.	All topics covered in Year 12 and the following Year 13 topics: • Neuronal communication • Energy for biological processes • Respiration • Patterns of inheritance and variation • Manipulating genome • Ecosystems Populations and sustainability	

Exam Board: OCR Oxford Cambridge and RSA

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