

Year 12: Biology (Strand 1)

	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
	Basic Components of Living Systems	Plasma Membranes and Nucleic Acids	Cell Division	Classification and evolution	Biodiversity	Communicable diseases
Content: What will students know	Students will learn how to measure cells using a light microscope. They will study different types of microscope and the ultrastructure of eukaryotic and prokaryotic cells.	Students will learn about the fluid mosaic model of membrane structure and will investigate how factors may affect the stability of membranes. Diffusion, osmosis and active transport ideas from GCSE are built on here. Structure of RNA, DNA, DNA replication and protein synthesis is studied here too.	Students will build on current knowledge of cell division looking at the cell cycle, mitosis and meiosis in greater depth. The organisation and specialisation of cells and the function of stem cells is also covered. Students will research a use of stem cells in medicine.	The importance of classification and phylogenetics is studied here. Students will develop their understanding of evolution through natural selection from GCSE and the evidence for it. They will be introduced to several statistical tests to examine significance in the context of variation.	Students will learn about the different types of sampling techniques and look at biodiversity at 3 levels – genetic, habitat and species. They will use the Simpson's index to rate and compare the biodiversity of different habitats. They will study conservation techniques and approaches.	Pathogens affecting animals and plants will be studied and the impact of these on health and food supply noted. Students will build on GCSE knowledge to outline the specific and non-specific responses to pathogens entering animals and plants. Study of antibiotic effectiveness and prevention and treatment of disease is also covered.
Assessment	End of topic assessment.	End of topic assessment.	End of topic assessment.	End of topic assessment.		End of year assessment.

Year 12: Biology (Strand 2)

	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
	Biological Molecules	Enzymes	Gas Exchange	Animal Transport	Plant Transport	Plant transport and Exam preparation
Content: What will students know	Students will learn the structure and function of macromolecules and how to test for them quantitatively and qualitatively.	Students will build on their existing knowledge about enzymes and investigate factors that affect enzyme activity. They will learn about inhibitors and types of inhibition as well as cofactors, coenzymes and prosthetic groups.	Students will consider how gas exchange surfaces are specialised and compare the systems in mammalian, insect and fish. During this topic students will perform dissections.	Students will study the mammalian circulatory system. Including the structure of the heart, cardiac cycle and generation of a heartbeat. Blood vessels, blood components and the formation of tissue fluid are covered here. How oxygen and carbon dioxide are transported and the Bohr shift.	Students will learn about the transport system in dicotyledonous plants and how water is transported in multicellular plants. Students will develop their understanding of transpiration and translocation from GCSE and discuss how plants are adapted to water availability.	Students will complete the rest of the plant transport module and prepare for the end of year exams by reviewing year 12 material and using exam questions to improve exam technique.
Assessment	End of topic assessment.	End of topic assessment.	End of topic assessment		End of topic assessment.	Mock

Year 13: Biology (Strand 1)

	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
	Neuronal and Hormonal Communication	Respiration	Manipulating Genomes	Cloning and Ecosystems	Populations and Revision	Students on Study Leave
Content: What will students know	Students will know the structure of neurons and how the nervous system is organised. How action potentials are generated and propagated. They will learn about reflexes, synapses, brain, muscle structure and the sliding filament theory. They will examine the endocrine system with a focus on the pancreas and control of blood glucose.	Students will learn the biochemistry of the stages of aerobic and anaerobic respiration and relate this to the structure of mitochondria. They will also plan and carry out an investigation in the respiration of yeast.	Students will learn about techniques such as PCR, gel electrophoresis and carry these out in an Amgen workshop. They will learn about genetic sequencing and genetic engineering.	Students will learn about different types of animal and plant cloning. They will learn how to work safely in the lab with bacteria and learn about some industrial processes such as using immobilised enzymes. The ecosystem topic covers how biomass is transferred through ecosystems, succession and sampling.	They will study biotic factors such as interdependence and competition on population size. Some case studies of ecosystem management are covered here. Students will also be preparing by working on exam technique and synoptic questions during this term too.	
Assessment	End of topic assessment.	End of topic assessment.	End of topic assessment and mocks	End of topic assessment.	End of topic assessment	A level Exams

Year 13: Biology (Strand 2)

	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
	Homeostasis	Plant hormones and photosynthesis	Genetics	Patterns of Inheritance	Revision	Students on Study Leave
Content: What will students know	Students will cover how excretion occurs – involving studying the structure and function of the liver and kidney. How the kidneys regulate water balance and the role of ADH. Students will study how urine can be tested and the topic of kidney failure and dialysis.	Students will learn how plants respond to their environment and coordinate their actions with the use of hormones. They will learn about the biochemistry of photosynthesis including chemiosmosis.	Students will learn about various ways in which gene expression can be controlled. The genetic control of body plans and the role of mitosis and apoptosis in controlling the development of form will be studied here.	Students will cover patterns of inheritance. This will include using the chi-squared (χ^2) test to determine the significance. Factors that can affect the evolution of a species and speciation are also studied here. Artificial selection will also be covered as part of this topic.	Students will review content and work on their exam technique including PAG and synoptic questions.	
Assessment	End of topic assessment.	End of topic assessment.	End of topic assessment.			A level exams