



Course Outline:

A Level Biology

Year 12

Rationale – A Level Biology in the associated sixth form is taught through the AQA specification. We begin with the study of cell structure, transport across membranes, mitosis and the study of biological molecules. This allows students to build on the knowledge and skills from GCSE Science and supports the understanding of the topics covered later in both Years 12 and 13. We then move on to study the immune system, exchange and transport systems, genes and variation. Year 13 progresses through respiration, photosynthesis and ecosystems, before covering the nervous system, homeostasis, inheritance and gene expression. In all topics taught we endeavour to begin with familiar content and build on this throughout the unit of work.

	CONTENT	KEY/FUNDAMENTAL CONCEPTS	ASSESSMENT
Autumn Term	Cell Structure	Methods of studying cells Eukaryotic Cell Structure Cell Specialisation and Organisation Prokaryotic Cell Structure	Cells and Cell Division Test Biological Molecules Test
	All Cells Arise from Other Cells	The Cell Cycle & Mitosis Binary Fission in Prokaryotes Replication of Viruses Required Practical 2 – Root Tip Squash	(45 minutes each; exam questions on all content)
	Biological Molecules	Monomers and Polymers Carbohydrates Lipids Proteins Enzymes and activity Required Practical 1 – Enzyme Investigation	
	Half-term		
	Transport Across Cell Membranes	Structure of the Cell Surface Membrane Simple Diffusion Facilitated Diffusion Active Transport Co-Transport Required Practical 4 – Membrane Permeability Osmosis Required Practical 3 – Water Potential - Osmosis	Membrane Transport Test Enzymes and DNA Test (45 minutes each; exam questions on all content)
	Nucleic Acids, ATP, Water and Ions	Structure of DNA and RNA DNA replication Energy and ATP Water and its Functions Inorganic Ions	
	Cell Recognition and the Immune System (completed in January)	Defence Mechanisms Phagocytosis T Lymphocytes and Cell mediated Immunity B Lymphocytes and Humoral Immunity	

		Antibodies Vaccination HIV and AIDS The ELISA Test	
Christmas Holiday			

	CONTENT	KEY/FUNDAMENTAL CONCEPTS	ASSESSMENT
Spring Term	Gas Exchange	Surface Area : Volume Ratio Gas Exchange in Single Celled Organisms Gas Exchange in Insects Gas Exchange in Fish Gas Exchange in Plant Leaves Limiting Water Loss in Xerophytes Structure of the Human Gas Exchange System The Mechanism of Breathing Gas Exchange in the Lungs	Immunology Test Gas Exchange and Absorption Test (45 minutes each; exam questions on all content)
	Digestion and Absorption	Enzymes and Digestion Absorption of the Products of Digestion	
	DNA, Genes and Protein Synthesis	DNA and Chromosomes Genes and the Triplet Code RNA Structure	
	Half-term		
	DNA, Genes and Protein Synthesis	Protein Synthesis – Transcription Protein Synthesis – Translation Mutations Meiosis and Genetic Variation	Protein Synthesis Test Circulatory System Test (45 minutes each; exam questions on all content)
	Mass Transport in Animals	The Circulatory System The Structure of the Heart Required practical 5 - Heart Dissection The Cardiac Cycle Blood vessels and their Functions Tissue Fluid Haemoglobin Transport of Oxygen by Haemoglobin	
Easter Holiday			

	CONTENT	KEY/FUNDAMENTAL CONCEPTS	ASSESSMENT
Summer Term	Genetic Diversity & Adaptations	Genetic Diversity Natural Selection Required Practical 6 - Investigating Antibiotics Species and Taxonomy Biodiversity Within a Community Investigating Diversity	Genetic Diversity Test (45 minutes; exam questions on all content) Year 12 Mock Exam (Past Paper Exam) – 2 hours
	Mass Transport in Plants	Transport of Water in the Xylem Transport of Organic Molecules in the Phloem Investigating Transport in Plants	
	Half-term		
	YEAR 13 CONTENT taught this half term		Plant Transport Test (45 minutes; exam questions on all content)
	Populations in Ecosystems	Populations Terminology Variation in Population Size Competition & Predation Succession Habitat Conservation Investigating Populations Required Practical 12 – Species Distribution Investigation Field Trip to Runswick Bay	

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Year 13

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Autumn Term	Energy & Ecosystems	Recap Populations in Ecosystems from End of Year 12 Food Chains & Energy Transfer Energy Transfer & Productivity Nutrient Cycles Natural & Artificial Fertilisers Environmental Issues- Fertilisers	Photosynthesis and Respiration Test Chapter 19 Ecology Test Nutrient Cycles and Energy Transfer Test
	Photosynthesis	Overview of Photosynthesis The Light Dependent Reaction The Light Independent Reaction Required Practical 7 – Chlorophyll Chromatography Required Practical 8 - Investigating Photosynthesis	(45 minutes each; exam questions on all content)
	Respiration	Overview of Respiration Glycolysis The Link Reaction and Krebs Cycle Oxidative Phosphorylation Anaerobic Respiration Required Practical 9 – Investigating Respiration	
	Half-term		
	Response and The Nervous System (Part 1)	Response to Stimuli Taxes and Kineses Required Practical 10 – Choice Chambers Plant Growth Factors The Reflex Arc Receptors The Eye Control of Heart Rate	Nerves Test (45 minutes; exam questions on all content) Year 13 Mock Exam (Past Paper Exam) – 2 hours
	Response and The Nervous System (Part 2)	Neurones and Nervous Coordination The Nerve Impulse Synapse – Structure & Function Skeletal Muscle Structure Skeletal Muscle - Contraction	
	Inheritance	Monohybrid Inheritance Genetic Crosses Dihybrid Inheritance Codominance & Multiple Alleles Sex-Linkage Autosomal Linkage Epistasis The Chi-squared Test Population Genetics Natural Selection & Speciation	
Christmas Holiday			

	CONTENT	KEY/FUNDAMENTAL CONCEPTS	ASSESSMENT
Spring Term	Homeostasis	Principles of Homeostasis Feedback Mechanisms Hormones and Control of Blood Glucose Diabetes and its Control	Muscles and Synapses Test (45 minutes; exam questions on all content)
	The Control of Gene Expression	Gene Mutations Stem Cells and Totipotency Regulation of Transcription and Translation Epigenetic Control of Gene Expression Gene Expression and Cancer Genome Projects	
	Half-term		
	Homeostasis (continued)	Control of Blood Water Potential The Kidney – Nephron Structure The Role of the Nephron in Osmoregulation The Role of Hormones in Osmoregulation	Gene Expression Test Homeostasis Test (45 minutes each; exam questions on all content)
Recombinant DNA Technology	Producing DNA Fragments <i>In Vivo</i> Gene Cloning <i>In Vitro</i> Gene Cloning Genetic Screening and Counselling Genetic Fingerprinting	At least 4 essays written between March and May	
Easter Holiday			
Summer Term	Revision of all work covered throughout the course in preparation for the A Level examinations in June	Past Exam Question Practise – further development Essay Practice – development of techniques including planning as well as production	At least 4 essays written between March and May
	Half-term		