

Photosynthesis and Plant Physiology

Human Physiology

Cell Structure and Transport

Ecology

Human Health and Disease

Inheritance and Variation



The Core Themes in **Biology**

The **Biology** curriculum at Walton High School is **evidence-informed** in its design.

- Knowledge is organised into **core themes** which are **sequenced** effectively over many years. Students make explicit **links** between different biological concepts.
- Knowledge is **sequenced** to ensure that students have the **pre-requisite knowledge** necessary to learn new concepts. This **reduces cognitive load** and maximises retention of new learning.
- Knowledge is **revisited** over key stages, gradually increasing in complexity in a **spiral curriculum** design. This deepens knowledge and understanding of biological concepts.
- We have specified the key knowledge in our KS3/4 curriculum through the use of **Core Knowledge questions**.



WALTON HIGH SCHOOL – KS3 CURRICULUM OVERVIEW FOR **BIOLOGY**

Year Group	Half Term 1	Half Term 2	Half Term 3	Half Term 4
7	Cell Biology <ul style="list-style-type: none"> • Microscopy • Plant vs. Animal Cells • Specialised Cells • Unicellular Organisms 	Botany <ul style="list-style-type: none"> • Photosynthesis • Leaf Structure 	Human Physiology <ul style="list-style-type: none"> • Skeletal System • Muscles • Lungs and Gas Exchange • Breathing 	Human Physiology <ul style="list-style-type: none"> • Puberty • Human Reproduction. • Pregnancy and Birth
		Ecology <ul style="list-style-type: none"> • Food Chains and Webs • Disruption to Food Chains and Webs • Human Impact on the Environment 	Botany <ul style="list-style-type: none"> • Plant Reproduction & Seed Dispersal 	Health and Disease <ul style="list-style-type: none"> • Contraception and STIs
	Core Knowledge Home Learning Resources	Core Knowledge Home Learning Resources	Core Knowledge Home Learning Resources	Core Knowledge Home Learning Resources
8	Human Physiology <ul style="list-style-type: none"> • Aerobic and Anaerobic Respiration • The Effect of Exercise on the Human Body 	Human Physiology <ul style="list-style-type: none"> • A Balanced Diet • Food Tests • Digestive System 	Genetics <ul style="list-style-type: none"> • Variation and Evolution • Extinction 	Health and Disease <ul style="list-style-type: none"> • Lung Diseases • A Healthy Pregnancy • Recreational Drugs
	Botany <ul style="list-style-type: none"> • Plant Disease and Deficiency 	Health and Disease <ul style="list-style-type: none"> • Malnutrition 	Ecology <ul style="list-style-type: none"> • Animal Adaptations • Plant Adaptations 	Ecology <ul style="list-style-type: none"> • Human Impact on the Environment – Colony Collapse Disorder
	Genetics <ul style="list-style-type: none"> • The History of DNA • DNA, Genes and Chromosomes 			
	Core Knowledge Home Learning Resources	Core Knowledge Home Learning Resources	Core Knowledge Home Learning Resources	Core Knowledge Home Learning Resources
9	Cell Biology <ul style="list-style-type: none"> • Eukaryotic vs. Prokaryotic Cells • Calculations Involving Microscopes • Optical vs. Electron Microscopes. 	Ecology <ul style="list-style-type: none"> • Ecosystem Organisation • Animal Adaptations and Competition • Plant Adaptations and Competition. 	Botany <ul style="list-style-type: none"> • Uses of Glucose. • Limiting Factors of Photosynthesis. 	Human Physiology <ul style="list-style-type: none"> • Blood and Blood Vessels • The Heart
		Botany <ul style="list-style-type: none"> • Photosynthesis • Leaf Structure 	Human Physiology <ul style="list-style-type: none"> • Aerobic and Anaerobic Respiration. • Gas Exchange in Humans. 	Health and Disease <ul style="list-style-type: none"> • Heart Disease.
				Genetics <ul style="list-style-type: none"> • DNA, Genes, Chromosomes and Variation.
	Core Knowledge Home Learning Resources	Core Knowledge Home Learning Resources	Core Knowledge Home Learning Resources	Core Knowledge Home Learning Resources



WALTON HIGH SCHOOL – KS4 CURRICULUM OVERVIEW FOR **TRIPLE BIOLOGY**

Year Group	HT1 (Sept-Oct)	HT2 (Nov-Dec)	HT3 (Jan-Feb)	HT4 (March-April)	HT5 (April-May)	HT6 (June-July)
10	Cell Biology <ul style="list-style-type: none"> Diffusion, Osmosis and Active Transport 	Ecology <ul style="list-style-type: none"> Carbon Cycle Decomposition 	Health and Disease <ul style="list-style-type: none"> Pathogens and Disease. The Immune Response Vaccination. Antibiotics and Bacterial Growth 	Health and Disease <ul style="list-style-type: none"> Developing New Drugs. Drug Testing Cancer Alcohol and Smoking Monoclonal antibodies 	Ecology <ul style="list-style-type: none"> Quadrats and Sampling Pollution of Land, Water and Air. Deforestation. 	Genetics <ul style="list-style-type: none"> Mitosis vs. Meiosis Asexual vs. Sexual Reproduction. DNA Structure Protein Synthesis.
	Botany <ul style="list-style-type: none"> Transpiration and Translocation 					
	Human Physiology <ul style="list-style-type: none"> Food tests Digestive System 	Human Physiology <ul style="list-style-type: none"> Enzymes Factors Affecting Enzymes Effect of exercise Metabolism 	Botany <ul style="list-style-type: none"> Plant Disease and Deficiency. 	Cell Biology <ul style="list-style-type: none"> The Cell Cycle and Mitosis. Stem Cells 	Paper 1 Mock Exam Provides an estimated grade for students as they progress into year 11.	Ecology <ul style="list-style-type: none"> Global Warming Biodiversity Biomass and Trophic Levels Sustainable Food Production.
	Core Knowledge Home Learning Resources	Core Knowledge Home Learning Resources	Core Knowledge Home Learning Resources	Core Knowledge Home Learning Resources		
11	Human Physiology <ul style="list-style-type: none"> The Nervous System Reflexes and Reactions The Eye Homeostasis Thermoregulation. Hormones 	Human Physiology <ul style="list-style-type: none"> Glucose Regulation and Diabetes Menstrual Cycle Fertility 	Human Physiology <ul style="list-style-type: none"> The Kidney Osmoregulation 	Genetics <ul style="list-style-type: none"> Evolution Speciation Fossils and Extinction Selective Breeding Genetic Engineering Cloning Classification 	<h1 style="margin: 0;">PUBLIC EXAMINATIONS</h1>	
		Botany <ul style="list-style-type: none"> Plant Hormones 	Health and Disease <ul style="list-style-type: none"> Kidney Disease 			
		Paper 1 Mock Exam Provides an estimated grade for students.	Genetics <ul style="list-style-type: none"> Inheritance and Genetic Diseases. Screening 			
	Paper 2 Mock Exam Provides an estimated grade for students.	Core Knowledge Home Learning Resources	Core Knowledge Home Learning Resources	Core Knowledge Home Learning Resources		



WALTON HIGH SCHOOL – KS5 CURRICULUM OVERVIEW FOR **BIOLOGY**

Year Group	HT1 (Sept-Oct)	HT2 (Nov-Dec)	HT3 (Jan-Feb)	HT4 (March-April)	HT5 (April-May)	HT6 (June-July)
12	Cell Biology <ul style="list-style-type: none"> Eukaryotic vs. Prokaryotic Cells Light vs. Electron Microscopes Ultracentrifugation 	Cell Biology <ul style="list-style-type: none"> Membranes Diffusion, Osmosis, Active Transport and Cotransport. Cell Cycle and Mitosis. 	Health and Disease <ul style="list-style-type: none"> Immunity (Phagocytosis, T Cells and B Cells). Antibodies 	Animal Physiology <ul style="list-style-type: none"> Fish and Insect gas exchange systems. Mammalian breathing systems and gas exchange. 	Ecology <ul style="list-style-type: none"> Biodiversity Energy transfer through food chains Investigating ecosystems 	Photosynthesis and Plant Physiology <ul style="list-style-type: none"> Plant Tropisms.
	Biochemistry <ul style="list-style-type: none"> Carbohydrates ATP Water Proteins Enzymes 	Animal Physiology <ul style="list-style-type: none"> Haemoglobin Blood Vessels The Heart and Circulatory System. The Cardiac Cycle 	Biochemistry <ul style="list-style-type: none"> Transcription, Translation and Protein Synthesis. 	Health and Disease <ul style="list-style-type: none"> Vaccination HIV Antibiotics 	Inheritance and Variation <ul style="list-style-type: none"> Mono and dihybrid Inheritance. Sex-linkage, codominance, epistasis and linkage. Hardy Weinberg 	Animal Physiology <ul style="list-style-type: none"> Choice Chambers
		Biochemistry <ul style="list-style-type: none"> DNA structure and Replication. The Triplet Code 	Inheritance and Variation <ul style="list-style-type: none"> Genetic Variation Meiosis vs. Mitosis 	Biochemistry <ul style="list-style-type: none"> Digestive Enzymes and absorption of products of digestion. 		Inheritance and Variation <ul style="list-style-type: none"> Mutations Regulation of transcription and Translation.
		Health and Disease <ul style="list-style-type: none"> Cancer 	Photosynthesis and Plant Physiology <ul style="list-style-type: none"> Transpiration and Translocation 	Biochemistry <ul style="list-style-type: none"> Digestive Enzymes and absorption of products of digestion. 		Ecology <ul style="list-style-type: none"> Field Trip Follow Up. Statistics.
13	Photosynthesis and Plant Physiology <ul style="list-style-type: none"> Chromatography of photosynthetic pigments. The Light Dependent and Independent Reactions. Limiting Factors 	Inheritance and Variation <ul style="list-style-type: none"> Gene Cloning DNA Technology Gene Therapy DNA Sequencing Fingerprinting 	Animal Physiology <ul style="list-style-type: none"> Reflexes. Receptors Control of Heart Rate Homeostasis Glucose regulation Diabetes 	Animal Physiology <ul style="list-style-type: none"> The Nerve Impulse Action Potential Synapses. Muscles The Kidney Osmoregulation 	<h1 style="text-align: center;">PUBLIC EXAMINATIONS</h1>	
	Inheritance and Variation <ul style="list-style-type: none"> Gene Expression Epigenetics Cancer Stem Cells 	Ecology <ul style="list-style-type: none"> Nutrient Cycles Impact of Fertilisers 	Inheritance and Variation <ul style="list-style-type: none"> Population genetics Natural Selection Speciation 	Essay Skills Exam Preparation		
	Ecology <ul style="list-style-type: none"> Succession Competition Predation Conservation 	Biochemistry <ul style="list-style-type: none"> Glycolysis, Link Reaction, Krebs Cycle and Oxidative Phosphorylation. Aerobic vs. Anaerobic Respiration 				