

KS4 Year 10 Combined Biology Curriculum

Curriculum Intent: We seek through an ambitious and engaging curriculum to develop a sense of curiosity to wonder why and how things work, and to provide skills and knowledge to find the answer. The curriculum is spiralsised to introduce and build on key scientific concepts to help students understand complex ideas enriched by opportunities outside the classroom.

Biology Curriculum Overview.

Biology is the study of life, and it closely connects with both Physics and Chemistry. In Year 7, the course begins with an exploration of the smallest unit of life—the cell—before moving on to the chemical basis of life, including DNA and the genome.

Next, students study organs and systems, followed by an examination of health and disease and their impact on the human body. The course then introduces biochemistry, lifecycles, and the concept of growth as a fundamental aspect of living organisms.

After exploring lifecycles, the curriculum covers human and plant reproduction. This leads into the topics of inheritance and ecosystems, where students learn about genetic transmission and the interactions within ecological systems.

Cells and biological organisation are revisited in greater detail, followed by a focus on infections and the body's immune response. Students then consolidate their understanding of biochemistry.

Taking advantage of the summer months, the course includes ecological fieldwork to investigate ecosystems in a hands-on way. The year concludes with a study of homeostasis, the human nervous and endocrine systems, and a final look at inheritance, variation, and evolution.

	Autumn Term		Spring Term		Summer Term	
Main Topic	B2 – Organisation B1 Cell Biology		B4 Bioenergetics and B3 infection and response		B4 – Bioenergetics B7 - Ecology	
Key Concepts	B1 – Cell structure & function, specialised cells, cell division (mitosis), cell transport RP1: Using a microscope RP2: Osmosis	B2 – Organisation: Organs & systems; digestive. Enzyme function RP3: Food Tests RP4: Enzyme Reactions	B4 – Bioenergetics: Aerobic & anaerobic respiration, photosynthesis, metabolism RP5: Rate of photosynthesis	B3 – Infection & Response: Communicable disease, immunity & medical drugs.	B4 – Bioenergetics: Aerobic & anaerobic respiration, photosynthesis, metabolism RP5: Rate of photosynthesis	B7 – Ecology: Biotic & Abiotic factors, food chains & measuring the size of a population. RP7: Quadrats – random sampling & transects
Curriculum links	KS3: SB1 – Cells SB3 – Health & Disease SB1 – Muscular Systems SB3 – Reproductios SB5 – Inheritance & genetics SC3 – Acids & Alkalies KS4:	KS3: SB1 – Cells SB2 – Nutrition & Digestion SC3 – Acids & Alkalies SC1 – Pure & Impure substances 9C2 – Chemical Reactions 8P1 – Contact Forces	KS3: SB1 – Cells SB5 – Health (Microorganisms) 9C2 – Chemical Reactions 7B2 – Gas Exchange Systems	KS3: SB1 – Cells SB5 – Health and Disease SB3 – Reproduction KS4: B1 – Cell Biology B2 – Organisation B6 – Inheritance, Variation & Evolution	KS3: 8B1 - Cells 8B5 – Health and disease (Microorganisms) 9C2 – Chemical Reactions SB2 – Gas Exchange Systems KS4:	KS3: 8B4 – Relationships in ecosystem 8C2 – Climate 7C1 – Particle Model 9C2 – Chemical reactions 7C3 – Earth's structure 7P3/9P2 - Energy

	All units.	KS4: B1 – Cell Biology. B3 – Infection & Response. B4 – bioenergetics B5 - Homeostasis	KS4: B2 – Enzyme Reactions B4 – Bioenergetics & Metabolism C5 - Exothermic Reactions C6 – Rates of Reaction C7 – Organic chemistry (alcohols) P6 - Wavelengths of ligh	B7 - Ecology	B2 – Enzyme Reactions B4 – Bioenergetics & Metabolism C5 - Exothermic Reactions C6 – Rates of Reaction C7 – Organic chemistry (alcohols) P6 - Wavelengths of light	KS4: P1 – Energy B2 – Organisation B4 – Bioenergetics C9 – Atmosphere C10 – using resources
Cross-curricular links	LIFE – Healthy eating. Maths – surface area to volume ratio. Magnification. Conversions of units. Standard form Geography – cell division		LIFE – Drug dependency, healthy lifestyles, smoking. R.E. - Ethics of drug testing Geography – Epidemiology History – History of medicine through time		Geography – Sampling & Climate History - Extinction	
Interleaving of skills	Identifying variables Writing a method Suggesting improvements Biological drawings Use of a microscope Measuring pH Continuous reaction Interpreting & drawing graphs – lines of best fit. Use of a waterbath		Interpreting data, making predictions Cause & effect/ correlation & causal link Bar charts		Sampling techniques Complex graphs with 2 tend lines – relationships Calculating means & areas Identifying variables Writing a method Suggesting improvements Using a gas syringe Calculating rates	
Literacy	B1 – Transport, Cell organelles, structure, function, dilute, concentration, permeable, partially, magnification, resolution, cell cycle, mitosis, gradient	B2 – Transport, concentration, exchange, qualitative, quantitative, cilia, reagent, organs, organism, organ system, tissue	B2 – Alveoli, Trachea, Bronchioles, exchange, concentration, transport, surface area, adaptations, active, passive, communicable, inherited	B3 – Communicable, symptom, treatment, pathogen, cure, immunity, antiretroviral drugs, contagious, transmission, toxicity, dosage, efficacy.	B4 – Product, Reactant, Exothermic, Endothermic, Rate, Aerobic, mitochondria, microorganism, leaf parts, structure, function	B7 – Quadrat, factor, transect, random, sample, biodiversity, habitat, biotic, abiotic, food chain, producer, consumer, predator, prey.
Cultural capital	Cells – the building block of life Understanding how the body works Health foods & diets Famous scientists – Robert Hooke		Healthy lifestyle – disease, drugs, alcohol etc. Famous scientific – Fleming, Semmelweis, Jenner. Importance of vaccinations & herd immunity, drug development.		Climate change & global warming. Lack of biodiversity Healthy lifestyles & exercise	
Careers	Microbiologist, Forensic scientist		Medical Related Careers e.g. Doctor, Nurse and Paramedic		~Climate Scientist Ecologist Health Care Professional	
Assessment	B1 – KMP B1 – CKT B2 - KMP		B2 – CKT B3 - CKT		B4 – KMP B4 – CKT Mock 1 – Paper 1	