

Year 9: Separate Biology	Curriculum Intent: Year 9 Separate Biology looks to build on the foundations from years 7 and 8 and work towards developing knowledge of similar areas as students begin to work towards their GCSE examinations: Cell Level systems, scaling up, organism level systems, community level systems, genes and inheritance, and global challenges. The subject and procedural knowledge demands increase in this year, and students will be exposed to more complex ideas, models and explanations. Practical Activities (PAG) will be coupled with mathematical skills to build more procedural knowledge, focusing on areas such as data analysis and interpretation of graphs. The scientific knowledge developed through this year will provide the basis for further study in these areas as students enter year 10, with the whole of the content being taught before the year 11 PPE's.						
	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2	
Key ideas and sequence of learning	Biology module B1 - cell level systems - Plant and animal cells - Bacterial Cells - Light Microscopes - Electron Microscopy - DNA Structure - Transcription and translation - Enzymes & enzyme reactions - Biological Molecules	Biology module B1 - cell level systems - Biological molecules - Aerobic and anaerobic Respiration - Photosynthesis - Factors affecting photosynthesis - Limiting factors of photosynthesis	Biology module B2- Scaling up - Diffusion - Osmosis - Active transport - Mitosis - Cell differentiation - Stem cells - Exchange and transport - Circulatory system	Biology module B2- Scaling up - Heart and blood - Plant transport systems. - Transpiration stream - Factors affecting transpiration	Biology Module 3 – Organism level systems - Nervous system - Reflexes - The Eye - The Brain - Nervous system Damage - Hormones and negative feedback	Revision for end of year exams End of Year exams and review Biology Module 3 – Organism level systems - Menstrual cycle - Controlling reproduction - Using hormones to treat infertility	
Key Questions	- What is inside a cell? - What happens inside a cell? - How do we digest food?	- How do cells release energy? - What is the difference between aerobic and anaerobic respiration? - How do plants produce and store food?	- Which processes help to transport substances across membranes? - How do body cells multiply? - What is the importance of stem cells? - How does the body transport oxygen?	How do plants transport water and what factors affect it?	- What is the role of the nervous system in the human body? - What is the role of the nervous system and the endocrine system in the human body? - What is inside the eye and how are images formed and how is vision corrected?	- What is the role of hormones in reproduction? - How can hormones be used to treat infertility and prevent contraception?	

		4. Which factors have an impact on the rate of photosynthesis ?			4. What is colour blindness? 5. What is the structure and the function of the brain? 6. How can we investigate brain function? 7. What is nervous system damage, what its effects and why is it difficult to repair?	
Vocabulary	- Cell membrane - Cell wall - Chloroplast - Cytoplasm - Eukaryotic cell - Flagellum - Mitochondria - Nucleus - Plasmid - Prokaryotic cell - Resolution - Magnification - Electron microscope - Vacuole - Active site - Bases - Chromosome - Complementary Base pairing - Denature - DNA	- Metabolic rate - Aerobic Respiration - Anaerobic Respiration - Metabolic rate - Oxygen debt - ATP - Exothermic - Fermentation - Chlorophyll - Endothermic - Limiting Factors - Photosynthesis - Light intensity	- Diffusion - Osmosis - Concentration gradient - Water potential - Turgid - Plasmolysis - Active Transport - Concentration gradient - Flaccid - Lysis - Crenated - Cell Cycle - DNA replication - Mitosis - Chromosomes - Specialised - Acrosome - Biconcave - Haemoglobin - Ciliated	- Ventricle - Transpiration - Palisade cell - Meristem - Differentiation - Meristems - Xylem - Phloem - Translocation - Vascular Bundle - Potometer	- Stimulus - Receptors - Effectors - Sensory neurones - Motor neurones - Relay neurons - Endocrine glands - Target organs - Hypothalamus - Thyroid Gland - Thyroxine. - Homeostasis. - Adrenaline - Cornea, pupil - Iris - Lens - Ciliary body - Suspensory ligaments - Optic nerves - Short sightedness - Long sightedness - Cerebrum	Ovulation - Follicle-stimulating hormone - Oestrogen - Luteinising hormone - Progesterone - Contraception - Fertility - In Vitro Fertilisation

	• DNA base • Polymer • Monomer • Enzyme • Active site • Gene		• Platelets • Mitosis • Alveoli • Artery • Atria • Capillary • Diffusion distance • Double Circulatory System • Exchange Surface • Heart • Lumen • Vein		• Cerebellum • Medulla • Hypothalamus • Pituitary Gland • MRI and CT scans • Central nervous system • Peripheral nervous system • Radiotherapy and chemotherapy • Deep brain stimulation	
Practical Skills	• Using Bioviewers to identify cells • Light Microscopy • Extracting DNA • Enzyme modelling • Investigating Enzyme activity •	• Food testing • Investigate the effect of exercise on heart rate • Testing for Starch in plants • Investigate factors affecting photosynthesis	• Investigate osmosis. • Mitosis modelling • Diffusion through indicator cubes	• Heart dissection • Movement water through xylem in celery. • Demonstrate stomata on leaves. • Investigate rate of transpiration using a potometer	• Investigate reaction rates • Eye dissection	