

Year 11: Biology Separate Science

Curriculum Intent: Year 11 Separate Biology looks to build on the foundation established in the Combined Science course. The more complex topics covered include protein synthesis, the eye, brain and kidney, pyramids of biomass and biomass transfer through the ecosystems, the history of genetics, the theory of evolution, plant defences and monoclonal antibodies. The knowledge gained provides students with a deeper insight into the subject, allowing them to tackle more complex problems and questions which link different areas. It also builds a solid knowledge base for progression to A level chemistry. Practical skills include the testing of biological molecules, qualitative investigation of osmosis and investigating the effect of fitness of the heart rate.



	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1
Key ideas and sequence of learning	<p>Module B1 – Cell level structure</p> <ul style="list-style-type: none"> DNA and protein synthesis <p>Module B3 – Organ level systems</p> <ul style="list-style-type: none"> Eye Brain Plant hormones Water regulation in the kidneys 	<p>Module B3 – Organ level systems</p> <ul style="list-style-type: none"> Body response to osmotic challenges <p>Module B4 – Community level systems</p> <ul style="list-style-type: none"> Pyramids of biomass Efficiency of biomass transfer <p>Module B5 – Genes, inheritance and selection.</p> <ul style="list-style-type: none"> Sexual and Asexual reproduction History of genetics Theory of evolution <p>Module B7 Practical Skills</p>	<ul style="list-style-type: none"> Revision and consolidation 	<p>Revision and consolidation</p> <p>Students begin their GCSE exams</p>	<p>Students finish their GCSE exams</p>
Key Questions	<ol style="list-style-type: none"> How does DNA look like and what is the structure of DNA? What happens during Transcription and Translation? What is inside the eye and how are images formed and how is vision corrected? What is colour blindness? What is the structure and the function of the brain? How can we investigate brain function? 	<ol style="list-style-type: none"> How much water does the body need? How does the body respond to a lack of water or too much water? Are sport drinks useful? What is a pyramid of biomass and how is it calculated? Why does biomass decrease at each tropic level? How do you calculate the efficiency of biomass transfer? 	<p>Students will review their PPE exam papers in detail to identify strengths and weaknesses</p> <p>Students will then prepare for their GCSE exams in lessons with their teacher. They will also have lectures for each module.</p>	<p>Students will prepare for their GCSE exams in lessons with their teacher.</p>	

	<ol style="list-style-type: none"> 7. What is nervous system damage, what its effects and why is it difficult to repair? 8. How do plants respond to their environment, light and gravity? 9. What does a plant use hormones for and what is their commercial use? 10. What is normal body temperature, how is it controlled and what happens when you get too hot or cold? 11. Why is it important to maintain water balance, how is urine produced and how does it change? 12. What do your kidneys look like inside and what does a nephron look like? 13. How does the body control how much urine is produced? 	<ol style="list-style-type: none"> 7. What is the difference between a decomposer and a detritivore? 8. How do decomposers release nutrients? 9. What factors affect the rate of decomposition? 10. What is sexual and asexual reproduction and do they compare? 11. How has scientists' understanding of genetics changed over time? 12. How was the theory of evolution formed? 			
<p style="text-align: center;">Vocabulary</p>	<ul style="list-style-type: none"> • Genes • Bases • Polymers • Nucleotides • Complementary base pairing • mRNA • Transcription, translation • Cornea, pupil • Iris • Lens • Ciliary body • Suspensory ligaments • Optic nerves • Short sightedness • Long sightedness • Cerebrum • Cerebellum 	<ul style="list-style-type: none"> • Hypertonic • Hypertonic • Isotonic • Dehydration • Thirst response • Pyramids of biomass • Egestion • Respiration • Excretion • Tropic levels • Decomposers • Detritivores • Aerobic and anaerobic conditions. • Sexual and asexual reproduction. • Gametes 			

	<ul style="list-style-type: none"> • Medulla • Hypothalamus • Pituitary Gland • MRI and CT scans • Central nervous system • Peripheral nervous system • Radiotherapy and chemotherapy • Deep brain stimulation • Phototropism • Gravitropism • Auxin • Ethene • Gibberellins • Parthenocarpy • Rooting powder • Dormancy • Thermoregulation • Vasodilation • Vasoconstriction • Lysis • Solute • Nephrons • Tubules • ADH (Anti-diuretic hormone) • Bowman's capsule • Loop of Henle • Glomerulus • Cortex • Medulla 	<ul style="list-style-type: none"> • Fertilisation • Clones • Zygote 			
<p>Practical Skills</p>	<ul style="list-style-type: none"> • Eye Dissection • Kidney dissection • Investigating the chill factor on your body temperature • Investigating Phototropism and gravitropism. 	<ul style="list-style-type: none"> • PAG B6 - Physiology 	<ul style="list-style-type: none"> • PAG B8 Osmosis 		