

<b>Year 9: Separate Biology</b>	<b>Curriculum Intent:</b> 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: <ul style="list-style-type: none"> <li>Cell Level systems, scaling up, organism level systems, community level systems, genes and inheritance, and global challenges.</li> </ul> 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.					
	<b>Autumn 1</b>	<b>Autumn 2</b>	<b>Spring 1</b>	<b>Spring 2</b>	<b>Summer 1</b>	<b>Summer 2</b>
<b>Key ideas and sequence of learning</b>	<b>Biology module B1 - cell level systems</b> <ul style="list-style-type: none"> <li>Plant and animal cells</li> <li>Bacterial Cells</li> <li>Light Microscopes</li> <li>Electron Microscopy</li> <li>DNA Structure</li> <li>Transcription and translation</li> <li>Enzymes &amp; enzyme reactions</li> <li>Biological Molecules</li> </ul>	<b>Biology module B1 - cell level systems</b> <ul style="list-style-type: none"> <li>Biological molecules</li> <li>Aerobic and anaerobic Respiration</li> <li>Photosynthesis</li> <li>Factors affecting photosynthesis</li> <li>Limiting factors of photosynthesis</li> </ul> <b>Biology module B2- scaling up</b> <ul style="list-style-type: none"> <li>Diffusion</li> </ul>	<b>Biology module B2- Scaling up</b> <ul style="list-style-type: none"> <li>Osmosis</li> <li>Active transport</li> <li>Mitosis</li> <li>Cell differentiation</li> <li>Stem cells</li> <li>Exchange and transport</li> <li>Circulatory system</li> </ul>	<b>Biology module B2- Scaling up</b> <ul style="list-style-type: none"> <li>Heart and blood</li> <li>Plant transport systems.</li> <li>Transpiration stream</li> <li>Factors affecting transpiration</li> </ul> <b>Biology Module 3 – Organism level systems</b> <ul style="list-style-type: none"> <li>Nervous system</li> </ul>	<b>Biology Module 3 – Organism level systems</b> <ul style="list-style-type: none"> <li>Reflexes</li> <li>The Eye</li> <li>The Brain</li> <li>Nervous system Damage</li> <li>Hormones and negative feedback</li> <li>Menstrual cycle</li> <li>Controlling reproduction</li> <li>Using hormones to treat infertility</li> </ul>	<b>Revision for end of year exams</b> <p>End of Year exams and review</p> <b>Biology Module 3 – Organism level systems</b> <ul style="list-style-type: none"> <li>Plant hormones</li> <li>Controlling body temperature</li> <li>Controlling blood sugar</li> </ul>
<b>Key Questions</b>	<ol style="list-style-type: none"> <li>What is inside a cell?</li> <li>What happens inside a cell?</li> <li>How do we digest food?</li> </ol>	<ol style="list-style-type: none"> <li>How do cells release energy?</li> <li>What is the difference between aerobic and anaerobic respiration?</li> </ol>	<ol style="list-style-type: none"> <li>Which processes help to transport substances across membranes?</li> <li>How do body cells multiply?</li> <li>What is the importance of stem cells?</li> <li>How does the body transport oxygen?</li> </ol>	<ol style="list-style-type: none"> <li>How do plants transport water and what factors affect it?</li> <li>What is the role of the nervous system in the human body?</li> </ol>	<ol style="list-style-type: none"> <li>What is the role of the nervous system and the endocrine system in the human body?</li> <li>What is inside the eye and how are images formed and how is vision corrected?</li> <li>What is colour blindness?</li> </ol>	<ol style="list-style-type: none"> <li>How do plants respond to their environment, light and gravity?</li> <li>What does a plant use hormones for and what is their commercial use?</li> <li>What is normal body temperature, how is it controlled and what happens when</li> </ol>

		<ol style="list-style-type: none"> <li>3. How do plants produce and store food?</li> <li>4. Which factors have an impact on the rate of photosynthesis ?</li> </ol>			<ol style="list-style-type: none"> <li>4. What is the structure and the function of the brain?</li> <li>5. How can we investigate brain function?</li> <li>6. What is nervous system damage, what its effects and why is it difficult to repair?</li> <li>7. What is the role of hormones in reproduction?</li> <li>8. How can hormones be used to treat infertility and prevent contraception?</li> </ol>	<p>you get too hot or cold?</p> <ol style="list-style-type: none"> <li>4. How does the body control blood sugar levels.</li> </ol>
<b>Vocabulary</b>	<ul style="list-style-type: none"> <li>• Cell membrane</li> <li>• Cell wall</li> <li>• Chloroplast</li> <li>• Cytoplasm</li> <li>• Eukaryotic cell</li> <li>• Flagellum</li> <li>• Mitochondria</li> <li>• Nucleus</li> <li>• Plasmid</li> <li>• Prokaryotic cell</li> <li>• Resolution</li> <li>• Magnification</li> <li>• Electron microscope</li> <li>• Vacuole</li> <li>• Active site</li> <li>• Bases</li> </ul>	<ul style="list-style-type: none"> <li>• Metabolic rate</li> <li>• Aerobic Respiration</li> <li>• Anaerobic Respiration</li> <li>• Metabolic rate</li> <li>• Oxygen debt</li> <li>• ATP</li> <li>• Exothermic</li> <li>• Fermentation</li> <li>• Chlorophyll</li> <li>• Endothermic</li> <li>• Limiting Factors</li> <li>• Photosynthesis</li> <li>• Light intensity</li> <li>•</li> </ul>	<ul style="list-style-type: none"> <li>• Diffusion</li> <li>• Osmosis</li> <li>• Concentration gradient</li> <li>• Water potential</li> <li>• Turgid</li> <li>• Plasmolysis</li> <li>• Active Transport</li> <li>• Concentration gradient</li> <li>• Flaccid</li> <li>• Lysis</li> <li>• Crenated</li> <li>• Cell Cyle</li> <li>• DNA replication</li> <li>• Mitosis</li> <li>• Chromosomes</li> <li>• Specialised</li> </ul>	<ul style="list-style-type: none"> <li>• Ventricle</li> <li>• Transpiration</li> <li>• Palisade cell</li> <li>• Meristem</li> <li>• Differentiation</li> <li>• Meristems</li> <li>• Xylem</li> <li>• Phloem</li> <li>• Translocation</li> <li>• Vascular Bundle</li> <li>• Potometer</li> </ul>	<ul style="list-style-type: none"> <li>• Stimulus</li> <li>• Receptors</li> <li>• Effectors</li> <li>• Sensory neurones</li> <li>• Motor neurones</li> <li>• Relay neurons</li> <li>• Endocrine glands</li> <li>• Target organs</li> <li>• Hypothalamus</li> <li>• Thyroid Gland</li> <li>• Thyroxine.</li> <li>• Homeostasis.</li> <li>• Adrenaline</li> <li>• Ovulation</li> <li>• Follicle-stimulating hormone</li> <li>• Oestrogen</li> <li>• Luteinising hormone</li> </ul>	<ul style="list-style-type: none"> <li>• Phototropism</li> <li>• Gravitropism</li> <li>• Auxin</li> <li>• Ethene</li> <li>• Gibberellins</li> <li>• Parthenocarp</li> <li>• Rooting powder</li> <li>• Dormancy</li> <li>• Thermoregulation</li> <li>• Vasodilation</li> <li>• Vasoconstriction</li> </ul>

	<ul style="list-style-type: none"> <li>• Chromosome</li> <li>• Complementary Base pairing</li> <li>• Denature</li> <li>• DNA</li> <li>• DNA base</li> <li>• Polymer</li> <li>• Monomer</li> <li>• Enzyme</li> <li>• Active site</li> <li>•</li> <li>• Gene</li> </ul>		<ul style="list-style-type: none"> <li>• Acrosome</li> <li>• Biconcave</li> <li>• Haemoglobin</li> <li>• Ciliated</li> <li>• Platelets</li> <li>• Mitosis</li> <li>• Alveoli</li> <li>• Artery</li> <li>• Atria</li> <li>• Capillary</li> <li>• Diffusion distance</li> <li>• Double Circulatory System</li> <li>• Exchange Surface</li> <li>• Heart</li> <li>• Lumen</li> <li>• Vein</li> </ul>		<ul style="list-style-type: none"> <li>• Progesterone</li> <li>• Contraception</li> <li>• Fertility</li> <li>• In Vitro Fertilisation <ul style="list-style-type: none"> <li>• Cornea, pupil</li> <li>• Iris</li> <li>• Lens</li> <li>• Ciliary body</li> <li>• Suspensory ligaments</li> <li>• Optic nerves</li> <li>• Short sightedness</li> <li>• Long sightedness</li> <li>• Cerebrum</li> <li>• Cerebellum</li> <li>• Medulla</li> <li>• Hypothalamus</li> <li>• Pituitary Gland</li> <li>• MRI and CT scans</li> <li>• Central nervous system</li> <li>• Peripheral nervous system</li> <li>• Radiotherapy and chemotherapy</li> <li>• Deep brain stimulation</li> </ul> </li> </ul>	
<b>Practical Skills</b>	<ul style="list-style-type: none"> <li>• Using Bioviewers to identify cells</li> <li>• Light Microscopy</li> <li>• Extracting DNA</li> <li>• Enzyme modelling</li> </ul>	<ul style="list-style-type: none"> <li>• Investigating Enzyme activity</li> <li>• Food testing</li> <li>• Investigate the effect of exercise on heart rate</li> <li>• Testing for Starch in plants</li> </ul>	<ul style="list-style-type: none"> <li>• Investigate osmosis.</li> <li>• Mitosis modelling</li> <li>• Diffusion through indicator cubes</li> </ul>	<ul style="list-style-type: none"> <li>• Heart dissection</li> <li>• Movement water through xylem in celery.</li> <li>• Demonstrate stomata on leaves.</li> <li>• Investigate rate of transpiration using a potometer</li> </ul>	<ul style="list-style-type: none"> <li>• Investigate reaction rates</li> <li>• Eye dissection</li> </ul>	<ul style="list-style-type: none"> <li>• Investigate phototropism</li> </ul>

		<ul style="list-style-type: none"><li>• Investigate factors affecting photosynthesis</li></ul>				
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