

## Year 13 Biology Sequence

	Content Taught	Reference	Essential Knowledge	Assessment	Rationale
<p>In year 13 students further develop their understanding of all content studied in years 10, 11 and 12 also have the opportunity to learn new knowledge not studied before. The year 13 biology curriculum provides all students with the essential knowledge for the second year of the key stage 5 curriculum and challenges students to apply this knowledge in many new situations</p>					
HT1	<p><b>Energy Transfer in and between organisms.</b> This unit continues from YR12 and interlinks the process of photosynthesis with respiration. Respiration is covered in detail and how energy is cycled within this process. Energy cycles within ecosystems are also studied and environmental issues</p>	<p>3.5.2 3.5.3</p>	<p>Glycolysis. Link Reaction and Krebs Cycle. Oxidative phosphorylation. Anaerobic Respiration. Food chains and energy transfer. Nutrient cycles. Fertilisers and environmental issues.</p> <p><b>Essential knowledge reading for consolidation:</b> <a href="#">AQA 5-Energy-Transfers-In-and-Between-Organisms Summary Notes</a> (<a href="http://physicsandmathstutor.com">physicsandmathstutor.com</a>)</p>	<p><b>Formative Assessment:</b> Daily, Weekly and Monthly Reviews focussing on reviewing material on Essential Knowledge.</p> <p>Use of TLaC techniques in lessons to check pupil understanding of essential knowledge during each lesson.</p> <p>Pupils are challenged with application questions that ‘bring the essential knowledge of the topic together.’</p> <p><b>End of topic Summative Assessments:</b></p>	<p><b>The energy transfer in and between organisms</b> unit – respiration. This unit further explores the transfer of energy between organisms and energy flow within cycles. Prior learning at KS4 on the topic of respiration and cycles within ecosystems supports and underpins learning in this unit. Biological molecules studied in HT1 also supports learning of this unit. This unit further supports continued learning in the course linking</p>

	<p>concerning cycling of nutrients discussed.</p> <p><b>Organisms respond to changes in their environments.</b> This unit looks at biological organisms and their responses to stimuli within their environments. This part of the unit continued from YR12 HT6 focuses upon the nervous system, nervous coordination and muscles.</p>	<p>3.6.2 3.6.3</p>	<p>Neurones and nervous coordination. Nerve impulses. Speed and action of nerve impulses. Synaptic transmission. Structure and contraction of skeletal muscle.</p> <p><b>Essential knowledge reading for consolidation:</b> <a href="http://physicsandmathstutor.com">AQA 6-Responding-to-Changes-in-the-Environment Summary Notes (physicsandmathstutor.com)</a></p>	<p>A range topic assessments followed by a final end of unit exam. Assessments are based upon the application of the essential knowledge that links ideas together throughout each topic.</p> <p><b>Formative Assessment:</b> Daily, Weekly and Monthly Reviews focussing on reviewing material on Essential Knowledge.</p> <p>Use of TLaC techniques in lessons to check pupil understanding of essential knowledge during each lesson.</p> <p>Pupils are challenged with application questions that ‘bring the essential knowledge of the topic together.’</p> <p><b>End of topic Summative Assessments:</b> A range topic assessments followed by a final end of unit exam. Assessments are based upon the application of the essential knowledge that links ideas together throughout each topic.</p>	<p>respiration to muscle contraction and nervous coordination.</p> <p><b>The organisms respond to changes in their environments</b> This unit allows study in depth of nervous coordination and muscles within biological organisms. Prior learning of the nervous system at KS4 and in HT6 YR12 with the reflex arc in more depth underpins the study of this unit. This unit supports further learning of homeostasis in Yr13 HT2 when studying the interaction of the nervous and endocrine systems to bring about homeostasis.</p> <p>The unit <b>genetics, populations, evolution and ecosystems</b> is underpinned by learning at KS4 in the following units. Inheritance and variation, evolution, populations and ecosystems. The study of biological molecules in YR12 HT2 of DNA and nucleic acids and of DNA, genes and protein synthesis, genetic</p>
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					diversity in YR12 HT4 and HT5 also supports learning in this unit. This unit further explores genetic inheritance and factors that affect how alleles are inherited from parents. This unit further supports learning in the course of the study of the control of gene expression.
<b>HT2</b>	<p><b>Genetics, populations, evolution and ecosystems.</b> This unit focuses upon the inheritance of characteristics and the role of genetics in inheritance. Monohybrid and dihybrid inheritance are studied along with the effects of codominance, sex linkage, autosomal linkage and epistasis.</p>	3.7.1	<p>Monohybrid/dihybrid inheritance. Probability. Codominance. Sex linkage. Autosomal linkage. Epistasis. Chi-squared test.</p> <p><b>Essential knowledge reading for consolidation:</b> <a href="#">AQA 7-Genetics-Populations-Evolution-and-Ecosystems Summary Notes (physicsandmathstutor.com)</a></p>	<p><b>Formative Assessment:</b> Daily, Weekly and Monthly Reviews focussing on reviewing material on Essential Knowledge.</p> <p>Use of TLaC techniques in lessons to check pupil understanding of essential knowledge during each lesson.</p> <p>Pupils are challenged with application questions that ‘bring the essential knowledge of the topic together.’</p> <p><b>End of topic Summative Assessments:</b> A range of topic assessments followed by a final end of unit exam.</p> <p>Assessments are based upon the application of the essential knowledge that links ideas together throughout each topic.</p>	<p><b>The control of gene expression</b> unit looks more closely and in much more depth at the control and regulation of transcription and translation. The use of recombinant DNA technology for cloning process and for diagnosing and treating genetic diseases is a key feature. Prior learning supporting this topic was studied in the genetic information, variation and relationships between organisms unit through the study of DNA, mutations and protein synthesis in YR12.</p>
	<p><b>Organisms respond to changes in their environments.</b> This unit looks at biological organisms</p>	3.6.4	<p>Feedback mechanisms. Blood glucose control. Diabetes. Osmoregulation and hormonal control.</p>	<p><b>Formative Assessment:</b> Daily, Weekly and Monthly Reviews focussing on reviewing material on Essential Knowledge.</p>	

	<p>and their responses to stimuli within their environments. In this section of the unit the topic of homeostasis is further explored at depth. The control of blood glucose and osmoregulation is a key feature of this unit.</p>		<p><b>Essential knowledge reading for consolidation:</b>  <a href="#">AQA 6-Responding-to-Changes-in-the-Environment Summary Notes</a>  <a href="http://physicsandmathstutor.com">(physicsandmathstutor.com)</a></p>	<p>Use of TLaC techniques in lessons to check pupil understanding of essential knowledge during each lesson.</p> <p>Pupils are challenged with application questions that ‘bring the essential knowledge of the topic together.’</p> <p><b>End of topic Summative Assessments:</b>  A range of topic assessments followed by a final end of unit exam.</p> <p>Assessments are based upon the application of the essential knowledge that links ideas together throughout each topic.</p> <p><b>Cumulative assessment 2 – summative test</b>  A cumulative and summative test taken in class and covers all topics studied up to this point.  Mock Exam.  A Level Papers 1 and Paper 2.</p> <p>Questions are a mix of recall and application questions to assess pupils understanding of essential knowledge up to this point.</p>	
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HT3	<p><b>Genetics, populations, evolution and ecosystems.</b></p> <p>This unit focuses upon the inheritance of characteristics and the role of genetics in inheritance. Variation between organisms is further explored alongside Natural Selection and forms of selection and their impact on Evolution. Populations in ecosystems are also studied focusing upon competition, succession and conservation. Practical application of learning through the completion of RP12 - Investigation into the effect of a named environmental factor on the distribution of a given species</p>	<p>3.7.2</p> <p>3.7.3</p> <p>3.7.4</p>	<p>Natural Selection.</p> <p>Variation.</p> <p>Forms of selection.</p> <p>Isolation and speciation.</p> <p>Populations in ecosystems.</p> <p>Competition/predation.</p> <p>Investigating populations.</p> <p>Succession.</p> <p>Conservation.</p> <p>Investigation into the effect of a named environmental factor on the distribution of a given species</p> <p><b><i>Essential knowledge reading for consolidation:</i></b></p> <p><a href="#">AQA 7-Genetics-Populations-Evolution-and-Ecosystems Summary Notes (physicsandmathstutor.com)</a></p>	<p><b><u>Formative Assessment:</u></b></p> <p>Daily, Weekly and Monthly Reviews focussing on reviewing material on Essential Knowledge.</p> <p>Use of TLaC techniques in lessons to check pupil understanding of essential knowledge during each lesson.</p> <p>Pupils are challenged with application questions that ‘bring the essential knowledge of the topic together.’</p> <p><b><u>End of topic Summative Assessments:</u></b></p> <p>A range of topic assessments followed by a final end of unit exam. Assessments are based upon the application of the essential knowledge that links ideas together throughout each topic.</p>	
	<p><b>The control of gene expression.</b></p> <p>This unit focuses upon the factors that affect</p>	<p>3.8.1</p> <p>3.8.2</p> <p>3.8.3</p> <p>3.8.4</p>	<p>Gene mutations.</p> <p>Stem cell totipotency.</p> <p>Regulating protein synthesis.</p> <p>Epigenic control.</p>	<p><b><u>Formative Assessment:</u></b></p> <p>Daily, Weekly and Monthly Reviews focussing on reviewing material on Essential Knowledge.</p>	

	<p>the expression of genes and how the translation process is affected. Students also focus upon how the expression of genes can be controlled and the impact of this and the use of DNA technology</p>		<p>Cancer. Genome projects. Recombinant DNA technology. In vitro/vivo cloning. Genetic screening and counselling. Genetic fingerprinting.</p> <p><b><i>Essential knowledge reading for consolidation:</i></b> <a href="http://physicsandmathstutor.com">AQA 8-Control-of-Gene-Expression Summary Notes (physicsandmathstutor.com)</a></p>	<p>Use of TLaC techniques in lessons to check pupil understanding of essential knowledge during each lesson.</p> <p>Pupils are challenged with application questions that ‘bring the essential knowledge of the topic together.’</p> <p><b><u>End of topic Summative Assessments:</u></b> A range of topic assessments followed by a final end of unit exam. Assessments are based upon the application of the essential knowledge that links ideas together throughout each topic.</p> <p><b><u>Cumulative assessment 2 – summative test</u></b> A cumulative and summative test taken in class and covers all topics studied up to this point. Mock Exam. 1 AQA A Level Paper 2.</p> <p>Questions are a mix of recall and application questions to assess pupils understanding of essential knowledge up to this point.</p>	
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<p><b>HT4</b> <b>HT5</b></p>	<p>Identification of strengths and weaknesses of the curriculum to plan re-teach and fill gaps.</p>	<p>All</p>	<p>Using question level analysis and data driven instruction, staff and pupils identify weaknesses in disciplinary knowledge (science skills) and substantive knowledge (topic content) and deliver re-teaching to improve overall essential knowledge of the KS5 physics curriculum.</p>	<p>Assessment is taken in class and covers all topics. Questions are a mix of recall and application questions to assess pupils understanding of essential knowledge covering the whole key stage 5 physics curriculum.</p>	
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