

Year 11 Biology Curriculum Map

Overview	<p>Triple biologists follow on their learning about hormonal control by learning about 2 examples of homeostatic control, in particular the control of body temperature and water balance.</p> <p>The curriculum now introduces the fundamental principles of how life reproduces. Types of reproduction and the role of meiosis in sexual reproduction follow. Students then learn about how genetic information is stored in the genetic molecule DNA, and how genetic information is passed on from one generation to the next. Gene mutations occur continuously and on rare occasions can affect the functioning of the animal or plant. These mutations may be damaging and lead to a number of genetic disorders or death. Students learn about the inheritance of genetic disease.</p> <p>Very rarely a new mutation can be beneficial and consequently, lead to increased fitness in the individual. Variation generated by mutations and sexual reproduction is the basis for natural selection; this is how species evolve. Students learn about this process, and how variation has allowed scientists to intervene through selective breeding to produce livestock with favoured characteristics. Once new varieties of plants or animals have been produced it is possible to clone individuals to produce larger numbers of identical individuals all carrying the favourable characteristic. The application of our understanding of genetic material is covered when learning about genetic engineering. The evidence for the theory of evolution finishes this section of the curriculum, with an emphasis on how genetic relationships are involved in the classification of life.</p> <p>The GCSE biology curriculum now concludes by tying together our understanding of how living things work by learning about how they interact with each other and their environment. The Sun is a source of energy that passes through ecosystems. Materials including carbon and water are continually recycled by the living world, being released through respiration of animals, plants and decomposing microorganisms and taken up by plants in photosynthesis.</p> <p>All species live in ecosystems composed of complex communities of animals and plants dependent on each other and that are adapted to particular conditions, both abiotic and biotic. These ecosystems provide essential services that support human life and continued development. In order to continue to benefit from these services humans need to engage with the environment in a sustainable way. In this section we will explore how humans are threatening biodiversity as well as the natural systems that support it.</p>				
Year 11	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1 & 2
Topic	B12 Homeostasis in action (triple only) B12/13 reproduction	B13/14 Variation and evolution B14/15 Genetics and evolution	B15/16 Adaptations interdependence and competition B16/17 Organising an ecosystem	B17/18 Biodiversity and ecosystems	Revision and exam preparation Final examinations and bridging work to A level
Knowledge	Control of body temperature including negative feedback loops/ (biology only)	Variation between organisms leading to natural selection and evolution. Selective breeding and genetic	Communities and their interaction between the physical and biotic environments. Adaptations: how organisms are	Biodiversity and the importance of this to humans. How humans are impacting on biodiversity, including waste management, global warming and	

	<p>Maintaining water and nitrogen balance in the body and the function of the kidney. (biology only)</p> <p>Sexual and asexual reproduction, and the role of meiosis.</p> <p>DNA, the human genome project.</p> <p>DNA structure (biology only)</p> <p>Genetic inheritance including Inherited disorders</p>	<p>engineering</p> <p>Cloning (biology only) including therapeutic and reproductive.</p> <p>The role of evolution in the formation of new species. (biology only)</p> <p>Evidence for evolution including the use of fossils and DNA. The causes extinction.</p> <p>Classification of living organisms</p>	<p>adapted to different environments including extreme environments.</p> <p>How materials are cycled, specifically carbon water and nitrogen.</p> <p>Decomposition and the process of decay. (biology only)</p>	<p>deforestation.</p> <p>Methods of maintaining biodiversity including conversation.</p> <p>Trophic levels in an ecosystem: the flow of energy through ecosystems and how this can be used to result in efficient food production. (biology only)</p>	
Skills	<p>Interpret a diagram of DNA structure but will not be required to reproduce it.</p> <p>Students should be able to construct a genetic cross by Punnett square diagram and use it to make predictions using the theory of probability.</p> <p>Students should make informed judgements about the economic, social and ethical issues concerning embryo screening, given appropriate information.</p>	<p>Explain the benefits and risks of selective breeding given appropriate information and consider related ethical issues.</p> <p>Interpret information about genetic engineering techniques and to make informed judgements about issues concerning cloning and genetic Engineering, including GM crops.</p> <p>Students should appreciate that the theory of evolution by natural selection developed over time and from information gathered by many scientists.</p>	<p>Students should be able to extract and interpret information from charts graphs and tables relating to the interaction of organisms within a Community.</p> <p>Measure the population size of a common species in a habitat.</p> <p>Use sampling techniques to investigate the effect of a factor on the distribution of this species.</p>	<p>Evaluate given information about methods that can be used to tackle problems caused by human impacts on the environment.</p> <p>Students should be able to calculate the efficiency of biomass transfers between trophic levels by percentages or fractions of mass.</p> <p>Students should be able to explain how this affects the number of organisms at each trophic level.</p> <p>Interpret population and food production statistics to evaluate food security.</p> <p>Understand that some people have ethical objections to some modern intensive farming methods.</p>	

Assessment		November – Mock Exam A Paper 1, covering Chapters 1 – 9 for Combined and Triple Science		March – Mock Exam A slightly edited Paper 2 covering: Combined Science Chapters 11 – 16 Triple Science – Chapters 10 - 17	
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