

	B6 – Inheritance, Variation and Evolution	B7 Ecology
Unit Title	Inheritance, Variation and Evolution	Ecology
Approximate Number of Lessons	22	24 Plus masterclasses in Autumn term 1
Curriculum Content	<p>The number of chromosomes are halved during meiosis and then combined with new genes from the sexual partner to produce unique offspring. 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. Very rarely a new mutation can be beneficial and consequently, lead to increased fitness. Variation generated by mutations and sexual reproduction is the basis for natural selection; this is how species evolve. An understanding of these processes 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. Scientists have now discovered how to take genes from one species and introduce them in to the genome of another by a process called genetic engineering. In spite of the huge potential benefits that this technology can offer, genetic modification still remains highly controversial.</p>	<p>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. 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. Humans are threatening biodiversity as well as the natural systems that support it. We need to take to ensure our future health, prosperity and wellbeing.</p>
Links to prior learning	<p>All learners will be able to: Outline the theory of natural selection Describe how features are passed on from parents Some learners will be able to: Describe how a mutation may affect an organism and its future offspring A few learners will be able to: Use a diagram to show the relationship between DNA, chromosomes and genes</p>	<p>All learners will be able to: Describe some factors that affect ecosystems. Describe and explain some simple food chains Some learners will be able to: Describe and explain some adaptations of some organisms which make them better suited to their environment. Describe how predators and prey are reliant on one another. A few learners will be able to: Calculate efficiency in food chains Interpret predator prey graphs</p>
Cultural Capital Opportunities	These are two books available with some great illustrations and explanations of evolution:	Visit to Botanical garden Cambridge https://www.botanic.cam.ac.uk/ (Children under 16 free Adult tickets £6.50)

	<p>On The Origin of Species by Sabina Radeva this is a 64 page retelling of Charles Darwin's Original Text. click here for amazon link</p> <p>Amazing Evolution: The Journey of Life by Anna Claybourne and Wesley Robins. Looks at the topic more broadly looking into the work of other scientists as well as Darwin. click here for amazon link</p> <p>Charles Darwin's original piece of literature, published in 1859. The Origin of Species by Charles Darwin click here for amazon link</p> <p>Visit to the Natural History Museum in London, Admission is free may have to book due to Covid restrictions. Check website for exhibition information. https://www.nhm.ac.uk/</p> <p>Website of the National Genome Institute some really interesting articles on mapping the human Genome https://www.genome.gov/human-genome-project</p> <p>New fossil discovered in 2021 a new species of human? Here is an article with some details https://www.newscientist.com/article/2282223-dragon-man-claimed-as-new-species-of-ancient-human-but-doubts-remain/</p> <p>Latest Genetic Engineering news on this website: https://www.genengnews.com/</p>	<p>Visit to Kew Gardens (London) https://www.kew.org/ For ticket price details: https://www.kew.org/kew-gardens/visit-kew-gardens/tickets</p> <p>BBC Sir David Attenbrough Series Dynasties, 7 worlds one planet, Blue Planet, Blue Planet II, or documentary Climate Change The Facts Available on BBC iPlayer</p> <p>BBC Springwatch and Autumnwatch, see living ecosystems as they change through the seasons, available on BBC iPlayer</p> <p>BBC documentary - Climate Change: Ade on the front line https://www.bbc.co.uk/iplayer/episodes/m000v4fb/climate-change-ade-on-the-frontline</p> <p>Article How much carbon in Kew's trees? https://www.kew.org/read-and-watch/kew-carbon-trees-draw-down</p> <p>Article Biodiversity, resilience and green recovery https://www.kew.org/read-and-watch/biodiversity-green-recovery</p> <p>Article What is Colour? https://www.kew.org/read-and-watch/what-is-colour focuses on how colours are used in nature</p>
Assessment Focus	End of topic test on Inheritance, Variation and Evolution and Homeostasis and Response. Y11 mock	End of topic test on ecology and Inheritance, Variation and Evolution
Name of Knowledge Organiser	B6 Inheritance – available from Science teachers.	B7 Ecology – available from Science teachers.