

Progression Model – Year 11 GCSE Biology (Separate Higher Tier)

Module Title: Inheritance, variation and Evolution	Module Title: Ecology and Biodiversity	Module Title: Sustainability and food production
Learning Intent for this module: Building upon what they learned in the Reproduction topic in Y7 students will study how sexual reproduction leads to variety. Building on knowledge from the genetics and evolution topic in Y8, students will explore how mutation can lead to new alleles of genes. They will explore how alleles of genes are inherited from two parents in different combinations leading to different characteristics. They will also learn how environmental selection pressures favour certain characteristics leading to evolution by natural selection. • Inheritance • Variation and Evolution	Learning Intent for this module: Building on their knowledge of bioenergetics from Y10 students will learn how materials such as carbon are recycled in ecosystems. They will learn how ecosystems are composed of complex communities of animals and plants dependent on each other and adapted to particular conditions. Students will explore the importance to all living organisms of biodiversity in ecosystems. They will also investigate how humans are threatening biodiversity as well as the natural systems that support it and actions that must be taken to ensure our future health and well-being. • Classification and evolution • Ecology	Learning Intent for this Module: Students will learn about some of the issues surrounding food security. They will examine different methods of farming to improve yields, including the role of biotechnology. They will also look at how we can create more sustainable fisheries. Students will act upon feedback from Mock exams and formative assessments to allow targeting of specific knowledge gaps in order to enhance their revision and practice. • Sustainability and food production • Exam preparation and revision of key topics
Key Content to be learned: Students will discover how the number of chromosomes are halved during meiosis and then combined with new genes from a sexual partner to produce unique offspring. They will learn the structure of DNA and how genes code for proteins. They will learn that gene mutations occur continuously and can affect the functioning of the animal or plant. They will discover that mutations can lead to a number of genetic disorders or death or can occasionally be beneficial leading to increased fitness in the individual. Students will learn the importance of variation as the basis for natural selection allowing species to evolve and speciation to occur. They will discuss how understanding these	Key Content to be learned: Students will learn how scientists classify organisms using a binomial system based on evolutionary relationships. They will learn how the Sun is a source of energy that passes through ecosystems and that this energy transfer is not completely efficient. They will learn how materials including carbon and water are continually recycled via respiration, photosynthesis, and the importance of decomposition in the process. Students will learn that 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. They will learn how ecosystems provide essential services that support human life and continued development.	Key Content to be learned: Students will learn that in order to continue to benefit from ecosystems humans need to engage with the environment in a sustainable way. They will learn that in order to ensure food security for the future different methods of farming will be required. They will learn the importance of sustainable fisheries and the role of biotechnology in food production. Students will revisit cells, organisation, communicable diseases, bioenergetics, homeostasis, inheritance & evolution and ecology. They will act upon feedback from mock exams and formative assessments to allow targeting of specific knowledge gaps in order to enhance their revision and practice. They will complete practice exam questions allowing them to recall and retrieve their knowledge and

processes required new theories to be developed. Students will study how this knowledge has allowed scientists to create new varieties of plants or animals first by selective breeding and more recently by cloning and genetic engineering. They will also explore the potential benefits and controversy around the techniques of genetic modification.	Students will explore how humans are threatening biodiversity as well as the natural systems that support it and consider some actions needed to ensure future health, prosperity and well-being.	improve exam technique by application of their knowledge.
Prior knowledge: • The nucleus containing genetic information in the form of DNA which is found inside the nucleus is covered in the cell division topic in Y9 • Genetic information being inherited from two parents via sexual reproduction is covered in the reproduction topic in Y7 • Inheritance of genes resulting in variation which leads to evolution is introduced in the genetics and evolution topic in Y8	Prior knowledge: • Communities of organisms being interdependent and relying on each other for food and/or shelter is covered in the ecology topic in Y8 • Organisms being adapted to their environments and how human activities can have a negative effect on these environments is introduced in the ecology topic in Y8 • The issues of fossil fuel use and pollution are introduced in the energy topic in Y7 • The carbon cycle and climate change are introduced in the Y8 Earth and atmosphere topic.	Prior knowledge: • The importance of good nutrition is covered in the digestion topic in Y9 • Improving yields from plants and the efficiency of energy transfer in animals are covered in the Bioenergetics topic in Y10 • Feedback from Mock exams and formative assessment will allow targeting of specific knowledge gaps and improvement of exam skills
Key tasks for this module: • Genetic Disease and Prenatal testing • Mock exam 1	Key tasks for this module: • Fossils and evolution • Mock exam 2	Key tasks for this module: • Ecology • GCSE Exams