



## Biology Curriculum Overview - Year 11 - Triple

Unit	Details
<b>Hormonal control</b>	Pupils will study the principles of hormonal control and the endocrine system. They will explore how blood-glucose concentration is controlled and be aware of the causes and treatments of type 1 and type 2 diabetes. Pupils study hormones in human reproduction. They will recall the action of hormones in bringing about puberty and how hormones interact in the menstrual cycle, as well as the role of testosterone. Pupils should understand how hormones are used in the control of fertility as applied to contraception and to infertility treatments. They will study the role of hormones in plants.
<b>Homeostasis</b>	Pupils study homeostasis, starting with why and how the body controls its temperature. Pupils should understand the role and functions of the human kidney, linking with work on diffusion, osmosis, and active transport in B1 <i>Cells and organisation</i> . They should recall that the kidneys produce urine by filtration of the blood and selective reabsorption of useful substances such as glucose, some ions, and water. They will learn the action of ADH as a hormone. Finally, they will look at treatments for kidney failure including dialysis and kidney transplantation, and be able to analyse the advantages and disadvantages of both treatment options.
<b>Reproduction</b>	Pupils will outline asexual and sexual reproduction, and should be aware of the importance of meiosis, fertilisation, and variation in sexual reproduction.. Pupils should recall that fungi, plants, and malaria parasites are able to use both types of reproduction. They should link this with work on the life cycle of the malarial protist in B5.8 <i>Diseases caused by fungi and protists</i> . They will study DNA and its role in inheritance. They will look at different types of mutation and their consequences. Inheritance is studied including inheritance of genetic disorders. They should be aware of developments in genetic engineering with the aim of curing genetic disorders.
<b>Variation and evolution</b>	Pupils should be able to discuss the causes of variation in terms of genetic, environmental, or a combination of both. They should link environmental variation with the effect of alcohol on a foetus in B7.5 <i>Alcohol and other carcinogens</i> . Pupils should understand the role of mutation in variation, understand the theory of evolution by survival of the fittest and natural selection, and be able to give examples. Pupils study the process of selective breeding. In studying genetic engineering, they should understand what is meant by the term, and be able to give examples of its use and consider the potential benefits and problems.
<b>Genetics and evolution</b>	Pupils should be able to describe several theories of evolution including the work of Lamarck and Darwin, focusing on Darwin's theory of natural selection. They should link this with B14.2 <i>Evolution by natural selection</i> . They should be familiar with Wallace's ideas on evolution and how he established our current theory of speciation. All pupils should be aware of evidence for evolution, including the fossil record and reasons for extinction. They should be able to describe antibiotic resistant bacteria and their fast evolution, in particular the problem of MRSA. Finally, they should understand how living organisms are classified.
<b>Adaptation, interdependence &amp; competition</b>	Pupils study communities, environments, adaptations, and competition. In studying organisms in their environments, they should recall the effects of abiotic and biotic factors on populations. Pupils will measure the distribution of organisms with quadrats and transects, and carry out a practical to investigate the population size of a common species in a habitat. Pupils study competition in animals and plants and should recall what factors they compete for and how they compete. Pupils should understand how organisms are adapted to survive in many different conditions.
<b>Organising an ecosystem</b>	Pupils study how feeding relationships are represented in food chains. They should understand the importance of photosynthesis in feeding relationships, linking with work in B8 <i>Photosynthesis</i> . They should be able to interpret predator-prey population graphs. Pupils have looked at mineral cycling and the microbes involved. Pupils study the water cycle and carbon cycle and should recall the main stages. They have studied factors that affect decomposition and the rate of decay. They should have conducted a practical investigation of the decay of organic matter.
<b>Biodiversity &amp; ecosystems</b>	Pupils will study the reasons for and the effects of the human population explosion. Pupils should understand the effect of different types of pollution including land, water, and air pollution, and be able to outline the processes of deforestation and peat destruction. They should link this with how materials are cycled in B17.3 <i>The carbon cycle</i> . Pupils should understand what is meant by the greenhouse effect, global warming, and its predicted effects. They study trophic levels, how biomass is transferred from one trophic level to the next, pyramids of biomass, and the efficiency of this energy transfer.