



Intent: The Y13 Biology curriculum aims to complete the remaining 4 modules of this linear course. It develops student skills in analytical thinking, writing reports and clear communication. Students undertake lab and field experiments which underpin the theoretical study; and hone teamwork and practical abilities. A-level Biology is a stepping stone to future study, and lays the groundwork for further study in courses like biological sciences and medicine.

<p>Year 13 Biology</p>	<p>Unit 1 Spec code 3.5 (Energy Transfer In and Between Organisms (September – Oct half term))</p>	<p>Unit 2 Spec code 3.6 (Organisms respond to changes in their internal and external environments.(November – mid January))</p>	<p>Unit 3 Spec code 3.7, 3.8 (Genetics, populations, evolution and ecosystems and Control of Gene Expression (Mid January - March))</p>
<p>Knowledge (facts, information, concepts and key terminology)</p>	<p>Green plants convert light energy into chemical energy through photosynthesis. The thylakoids contain chlorophyll The reactions of photosynthesis occur in two phases: the light-independent reactions, and the light-independent reactions Respiration describes the mechanism by which cells break down food into usable cellular energy. ATP (adenosine triphosphate). is the key molecule in this process, where it acts as a currency for cellular energy. Respiration consists of 4 steps: glycolysis, pyruvate oxidation, the Krebs cycle and the electron transport chain.</p>	<p>A stimulus is a change in the internal or external environment. A receptor detects a stimulus. A coordinator formulates a suitable response to a stimulus. An effector produces a response. Nerve cells pass electrical impulses along their length. A nerve impulse is specific to a target cell only because it releases a chemical messenger directly onto it, producing a response that is usually rapid, & short-lived. In contrast, mammalian hormones stimulate their target cells via the blood system. They are specific to the tertiary structure of receptors on their target cells and produce responses that are usually slow, long-lasting and widespread. Plants control their response using hormone-like growth substances.</p>	<p>Different species share a common ancestry, as represented in phylogenetic classification. The individuals of a species share the same genes but different combinations of alleles. A species exists as one or more populations which can become isolated from one another leading to speciation. There is variation in the phenotypes of organisms in a population, due to genetic and environmental factors. Cells are able to control their metabolic activities by regulating the transcription and translation of their genome. Gene expression may be altered by interfering with the epigenome of an organism. This has led to advances in the use of DNA technology in the diagnosis and treatment of human diseases.</p>
<p>Understanding (ability to connect and synthesise knowledge within a context)</p>	<p>Life depends on continuous transfers of energy. In both respiration and photosynthesis, ATP production occurs when protons diffuse down an electrochemical gradient through molecules of the enzyme ATP synthase, embedded in the membranes of cellular organelles. The process of photosynthesis is common in all photoautotrophic organisms and the process of respiration is common in all organisms, providing indirect evidence for evolution</p>	<p>Organisms increase their chance of survival by responding to changes in their environment through nervous and chemical communication. Homeostasis in mammals involves physiological control systems that maintain the internal environment within restricted limits. Negative feedback restores systems to their original level The possession of separate mechanisms involving negative feedback controls departures in different directions from the original state, giving a greater degree of control.</p>	<p>The theory of evolution underpins modern Biology. There is variation in the phenotypes of organisms in a population, due to genetic and environmental factors. There are many factors that control the expression of genes and, thus, the phenotype of organisms. Some are environmental factors, others are internal and control cellular control mechanisms. breakdown of these control mechanisms and the use of DNA technology in the diagnosis and treatment of human diseases.</p>
<p>Skills (successful application of knowledge and understanding to a specific task)</p>	<p>Student devise and carry out experiments to investigate the effect of named environmental variables on the rate of photosynthesis and respiration (CPAC 7 &9) Use of chromatography to investigate the pigments isolated from leaves of different plants (CPAC 8). Essay preparation</p>	<p>Student carry out experiments to investigate the effect of an environmental variable on the movement of an animal using a choice chamber (CPAC 10) Produce a dilution series of a glucose solution and use of colorimetric technique (CPAC11) Essay preparation</p>	<p>Students use statistics in genetics to compare the goodness of fit of observed phenotypic ratios with expected ratios. Students carry out experiments into the effect of a named environmental factor on the distribution of a given species. (CPAC 12) Students interpret data provided from investigations into gene expression. Essay preparation.</p>
<p>Formal Assessments</p>	<p>End of unit tests. Assessment week 1 .Feedback on assessed practical work in lab book</p>	<p>End of unit tests. 1st Mocks Feedback on assessed practical work in lab book</p>	<p>End of unit tests. 2nd Mocks Feedback on assessed practical work in lab book</p>

By the end of the year students on course for at least a grade C will...

- demonstrate knowledge and understanding of scientific, ideas, processes, techniques and procedures in a theoretical and practical context.
- Analyse qualitative and quantitative data experimental data and draw conclusions.
- Develop and refine practical designs and procedures.
- Produce an essay using the PEEL technique.