Year 10 - Biology

Autumn Term

Students begin to extend their knowledge of cells. They will learn about the process and importance of mitosis in growth and repair and consider the importance of monitoring growth as we develop from infancy to adulthood. Students also learn how plants and animals grow differently which explains the relatively finite nature of animal life. Knowledge of stem cells and their potential are explored as a revolutionary, but controversial, form of medical intervention as are the way in which specialised cells in the nervous system work to bring about reflex reactions that help organisms survive the trials of life. This knowledge of the nervous system is then extended to consider the structure and function of key areas of the brain – the cerebral cortex, cerebellum and medulla oblongata, as well as how issues affecting the function of the central nervous system are caused and diagnosed. The structure and function of the eyes are also examined in this topic.

Spring Term

Students then build on their knowledge of causes of variation, inheritance and sexual reproduction and will begin to explore how the characteristics of a living organism are influenced by its genome and its interaction with the environment. New concepts covered include meiosis as a significant source of variation, the structure of DNA and how this genetic code is able to produce new proteins, and the role of mutations in producing variation. The pioneering work of Mendel is discussed as are the ways in which multiple and missing alleles are responsible for characteristics such as blood group and colour-blindness.

The term finishes with a return to biology's most iconic molecule - DNA. They learn how DNA is responsible for the characteristics of organisms but extend this to explore Darwin's theory of evolution by natural selection and how it accounts for both biodiversity and the fact that all organisms are related to varying degrees. Students will also develop an appreciation of how selective breeding and genetic engineering are carried out and their benefits and drawbacks as well as exploring how tissue culture, GMOs, fertilisers and biological control agents are used in agriculture.

Summer Term

Biology then moves onto the study of plant structures and their functions which builds on both KS3 knowledge of photosynthesis and KS4 knowledge of the structure of plant cells and how they are specialised for their functions. Plants sustain almost all known food chains on planet earth and have to carry out every living process that animals do whilst being anchored to one location so students extend their knowledge by learning how plants are adapted to feed themselves through photosynthesis, including the factors that affect the rate at which this process occurs. They also learn how plants acquire water for transport, growth and support. Adaptions for extreme environments such as the desert are considered as are the role of hormones in controlling plant responses to light and gravity, ripening and germination. This topic lays the foundations for some of the work in the later biology topic on ecosystems.

Notes for 2021-22

The disruption caused by the pandemic last year meant that the Year 9 students did not start the GCSE course as early as usual. Therefore the triple scientists did not cover the food tests/calorimetry

element of their first topic and nor did they cover the health and disease topic. These will be addressed during Y10 instead but we still plan to cover the content described above in addition.