

Year 11 Biology Curriculum Overview - Term 1

Biology

Unit 6: Homeostasis and Response. Key topics include:

- The Nervous System: Understanding how the body detects and responds to stimuli, including the structure and function of neurons and reflex actions.
- Endocrine System: Exploring hormonal coordination, focusing on the role of glands and hormones in regulating processes like blood sugar control.
- Maintaining Internal Conditions: How the body maintains optimal conditions for enzymes and cells, including thermoregulation (controlling body temperature) and osmoregulation (water balance).
- Reproduction and Hormonal Control: Understanding the menstrual cycle, contraception, and fertility treatments.

Unit 7: Ecology. Key topics include:

- Interdependence and Competition: How organisms in ecosystems depend on each other for survival, and how they compete for resources such as light, space, water, and food.
- Adaptations: How organisms have evolved to survive in different environments, focusing on the structural, behavioural, and physiological adaptations of species.
- Ecosystems and Biodiversity: The balance of ecosystems and the importance of biodiversity. Students will study food chains, food webs, and the flow of energy through ecosystems.
- Human Impact on the Environment: Examining issues such as deforestation, pollution, global warming, and conservation efforts.
- Fieldwork and Practical Investigations: Students will have opportunities to conduct ecological surveys, such as quadrat sampling, to study population sizes and distribution in a habitat.

We are following the AQA KS4 Biology curriculum, designed to expand students' scientific knowledge and prepare them for their GCSE exams. Below is an outline of the topics we will be covering for both Combined Science and Triple Science classes this half term.

Combined Science (Biology) – Unit 5: Homeostasis and Response

Our Combined Science students will focus on Unit 5, Homeostasis

Combined and Triple - PMT and End of unit test and Response, which explores how the body maintains internal balance and responds to changes in the environment.

1. Homeostasis

- Students will learn about the importance of homeostasis in keeping the body's internal conditions stable, such as temperature, pH, and glucose levels.
- We will examine how various organs and systems contribute to maintaining this balance, focusing on real-life applications, such as the regulation of blood glucose in diabetes.

2. The Nervous System

- This topic covers the structure and function of the nervous system, including how the body detects stimuli and coordinates rapid responses.
- Students will explore the roles of sensory receptors, neurons, and the central nervous system, and learn about reflex actions as protective, automatic responses.

3. Hormonal Control in Humans

- Students will study how hormones help control key processes, including growth, metabolism, and reproductive cycles.
- We will discuss the role of the endocrine system and how specific glands, like the pancreas, pituitary, and adrenal glands, regulate body processes.

4. Human Reproduction and Fertility Control

- In this section, students will explore the biology of human reproduction, including the menstrual cycle, fertilization, and embryonic development.
- We will also discuss fertility treatments, contraception, and the social and ethical considerations related to reproductive technologies.

Triple Science (Biology) – Unit 5 and Introduction to Unit 6: Inheritance, Variation, and Evolution

In addition to completing Unit 5, Triple Science students will begin Unit 6, Inheritance, Variation, and Evolution. This unit will introduce the fundamentals of genetics and explore how genetic variation and environmental factors drive evolutionary change.

1. Genetic Inheritance and DNA

- Students will begin Unit 6 by studying DNA, genes, and chromosomes, understanding how genetic information is passed from parents to offspring.
- We will introduce Mendelian genetics, including dominant and recessive alleles, and use Punnett squares to predict patterns of inheritance.

2. Variation and Evolution

- Students will explore how genetic variation and natural selection lead to adaptation and evolution.
- We will discuss the work of Charles Darwin and examine real-world examples, like antibiotic resistance, to illustrate how species evolve over time in response to environmental pressures.