



A Level Biology – L6

Curriculum Intent

Biology is the study of living organisms and plays a crucial role in everyday life. It affects everyone, and biologists work to find solutions to many of the world's problems. Advances in technology have made Biology more exciting and relevant than ever. The A Level Biology curriculum gives students the opportunity to:

- develop essential knowledge and understanding of different areas of the subject and how they relate to each other
- develop and demonstrate a deep appreciation of the skills, knowledge and understanding of scientific methods
- develop competence and confidence in a variety of practical, mathematical and problem-solving skills
- understand how society makes decisions about scientific issues and how the sciences contribute to the success of the economy and society
- develop their interest in and enthusiasm for the subject, including developing an interest in further study and careers associated with the subject

Students will learn: -

Term 1: How the structure of cells adapts them to their function. About the structure and function of biologically important molecules. How the structure of biological membranes is related to their functions. How new cells are produced.

Term 2: How the gas exchange system is adapted for its functions in animals, insects and fish. How the transport system in animals is adapted to its function. How plants and animals defend themselves against pathogens.

Term 3: How transport is carried out in flowering plants. How various factors affect biodiversity and how biodiversity can be maintained. How organisms are classified. How evolution has generated a very wide variety of organisms. About interactions between and within ecosystems.

Knowledge, understanding & Skills

Term 1: Foundations in Biology and developing practical skills: Structure and ultrastructure of prokaryotic and eukaryotic cells. Functions of the various cellular components of eukaryotic cells. Preparation of microscope slides and measuring of objects seen with a light microscope. The structure and function of carbohydrates, lipids and proteins in living things. Develop skills to test quantitatively and qualitatively for biological molecules. How DNA replicates and the process of protein synthesis. Enzyme function and factors that affect them. The detailed structure of membranes and how substances cross these membranes. The process of mitosis and meiosis. The potential use of stem cells.

Term 2: Exchange and transport, communicable disease and the development of practical skills: The features of an efficient exchange surface. The structure and function of the components of the mammalian gas exchange system. The mechanism of ventilation of gas exchange in insects and fish. The need for a transport system as animals become larger. The structure and function of blood vessels and the mammalian heart. Safe use of instruments to dissect a heart and the production of scientific drawings. How oxygen and carbon dioxide are transported in humans. Understand how communicable diseases pass between hosts. How non-specific defences and the specific immune system defends animals against pathogens. How diseases can be prevented and treated.

Term 3: Transport in plants, Biodiversity, Evolution, Ecosystems and the development of practical skills: The structure of the vascular system in flowering plants. The transport of water and minerals into and through plants. The process of translocation. How sampling is used to measure biodiversity. Why it is important to maintain biodiversity. How classification systems have changed and continue to change. Evidence for the theory of evolution by natural selection. How evolution in some species has implications for humans. How biomass transfers through ecosystems and how matter is recycled. Techniques to study abundance and distribution of organisms.



How can you enhance your learning at home?

- ✓ Kerboodle
- ✓ Physicsandmathstutor
- ✓ Seneca learning
- ✓ AES student science website

Suggested homework tasks

- Learn spelling and definitions of key terms.
- Past examination questions practice
- Processing and analysis of data from practical activities
- Group and independent research projects

Entry requirements

To study A level Biology students require a 6 in GCSE Biology or 66 in GCSE Combined Science and a 5 in GCSE Maths.



How will we assess impact?

- Peer, self and teacher assessment in lessons
- Previous lesson recap quiz
- Teacher questioning
- Landmark tasks
- End of Topic tests

What does excellence look like?

- ✓ Linking ideas from different aspects of the specification to answer real life Biology problems
- ✓ Being able to apply knowledge and understanding to unfamiliar situations

e.g.

- Explain the evidence for the endosymbiotic theory
- Explain why the use of collagen in face creams is unlikely to prevent or reduce skin wrinkles.
- Explain how mutations in genes that code for check point proteins, involved in the cell cycle, can lead to tumour formation.
- Linking knowledge about lung structure and function to explain symptoms of lung diseases e.g. emphysema
- Explaining the impact on the body of various diseases of the circulatory system
- Explaining why zoonotic diseases are a global health concern
- Explaining the synthesis of monoclonal antibodies and their use as analytical agents
- Detailed analysis of data obtained from investigations on biodiversity

International Opportunities

Visits Programme

There is an opportunity to complete a 5-day residential field course at the FSC centre at Dale Fort in Pembrokeshire, Wales. Students will work with skilled FSC tutors, who will direct students' enthusiasm towards real-life ecological scenarios, and the collection of field data encouraging them to:

- Acquire and develop practical scientific competencies and sampling skills.
- Increase ecological understanding and make wider synoptic links related to specification content and beyond.
- Immerse themselves in a stunning natural location to observe and be curious, asking questions about the ecosystems, plants and animals they encounter.

Within the curriculum

The Biology A Level curriculum is designed to deepen understanding and appreciation of how our International society makes decisions about world scientific issues.

Students are encouraged to research each theme beyond lessons and set work to ensure that they can draw on a worldwide knowledge of the skills, techniques and theoretical understanding required for the further study of Biological Sciences.

