

## **A LEVEL BIOLOGY** **(AQA specification)**



Biology is an exciting and popular A Level course which is highly relevant to students in their everyday life. Our understanding of how biological systems function has advanced rapidly in recent years and there are many interesting opportunities for further study at university and research available in this field. Biology is also a key A Level for those students who wish to pursue a career in human or animal health.

The specification for A Level Biology is divided into 8 topic areas.

### **Year 1 Biology**

In year 1 content from the first four topics is covered together with Populations in ecosystems and energy and ecosystems from year 2 in the summer term.

#### **1 Biological molecules**

This topic develops an understanding of the structures and roles of key biomolecules essential for life including carbohydrates, lipids, proteins, enzymes, water, DNA, RNA, ATP and inorganic ions.

#### **2 Cells**

Cells are the structural and functional units of living organisms and so any biologist needs to study them in depth. This topic looks at the structures of eukaryotic and prokaryotic cells, viruses, microscopy, cell division, transport across membranes, cell recognition and the immune system.

#### **3 Organisms exchange substances with their environment**

To survive, organisms need to take in substances, including oxygen and food, from the environment and pass substances eg carbon dioxide out. This topic focuses on gas exchange, digestion and absorption, the circulatory system and mass flow in plants.

#### **4 Genetic information, variation and relationships between organisms**

How does variation occur between organisms? In this topic students will learn about DNA, genes and chromosomes, protein synthesis, how diversity arises through mutations and meiosis, adaptation and natural selection, classification and methods of investigating diversity.

### **Year 2 Biology**

In year 2, the remaining content from the four year 2 topics is covered.

#### **5 Energy transfers in and between organisms**

In this topic students will look at how energy enters an ecosystem and what happens to it. They will study the biochemistry of photosynthesis and respiration, energy in ecosystems and nutrient cycles including the nitrogen cycle and phosphorus cycle.

#### **6 Organisms respond to changes in their internal and external environment**

Organisms need to respond to changes in the environment to survive. This topic explores how animals and plants respond. It includes detailed study of the nervous system, homeostasis and the different types of responses e.g. tropisms in plants.

#### **7 Genetics, populations evolution and ecosystems**

How do we inherit our characteristics from our parents? We will work out possible outcomes from genetic crosses. How do new species arise? We will explore the idea of evolution leading to speciation. And once we have different species, how do they live together? We will study populations and communities within ecosystems.

#### **8 The control of gene expression**

In this topic students will look at what gene mutations are and how they are caused, how gene expression is controlled through regulation of transcription and translation, how a fault in the control of gene expression can lead to cancer and how we are using gene technology in society.

### **Practical work**

There are twelve Required Practicals students must complete as part of their A Level Biology course across the two years. The biological and practical skills will be tested as an integral part of the final examinations. The exam board awards a separate certificate for students who achieve competency in the skills used in the Required Practicals. This is called a practical endorsement.

### **Examinations**

At the end of year 2 students will sit three papers each lasting 2 hours.

#### **A Level Paper 1**

Any content from topics 1 to 4 including relevant practical skills

91 marks (35% of the A Level)

76 marks from a mixture of short and long answer questions

15 marks from extended response questions

#### **A Level Paper 2**

Any content from topics 5 to 8 including any relevant practical skills

91 marks (35% of the A Level)

76 marks from short and long answer questions

15 marks from comprehension questions

#### **A Level Paper 3**

Any content from topics 1 to 8 including any relevant practical skills

78 marks (30% of the A Level)

38 marks from structure questions including practical techniques

15 marks from critical analysis of experimental data

25 marks from an essay (choice of one from two titles)

*GCSE requirements:*

*Science – grade 6:6 in GCSE Combined Science, **or** a grade 6 in GCSE Biology*

*English Language – grade 4*

*Maths – grade 6*

***Students who wish to take two or more from Biology, Chemistry, Physics, Maths and Further Maths will need at least one grade 7 in a relevant Science or Maths***