

## **Biology GCSE**

---

Biology is the science of living organisms (including animals, plants, fungi and microorganisms) and their interactions with each other and the environment. The study of biology involves collecting and interpreting information about the natural world to identify patterns and relate possible cause and effect. Biological information is used to help humans improve their own lives and strive to create a sustainable world for future generations.

### **The Themes of Biology in the new specification will include:**

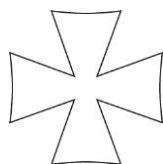
---

- Cell biology
- Transport systems
- Health, disease and the development of medicines
- Coordination and control
- Photosynthesis
- Ecosystems
- Inheritance, variation and evolution
- The genome and gene expression

Students should be helped to understand how, through the ideas of biology, the complex and diverse phenomena of the natural world can be described in terms of a small number of key ideas which are of universal application, and which can be illustrated in the separate topics set out below.

### **These ideas include:**

- life processes depend on molecules whose structure is related to their function
- the fundamental units of living organisms are cells, which may be part of highly adapted structures including tissues, organs and organ systems, enabling living processes to be performed effectively
- living organisms may form populations of single species, communities of many species and ecosystems, interacting with each other, with the environment and with humans in many different ways
- living organisms are interdependent and show adaptations to their environment
- life on Earth is dependent on photosynthesis in which green plants and algae trap light from the Sun to fix carbon dioxide and combine it with hydrogen from water to make organic compounds and oxygen
- organic compounds are used as fuels in cellular respiration to allow the other chemical reactions necessary for life
- the chemicals in ecosystems are continually cycling through the natural world
- the characteristics of a living organism are influenced by its genome and its interaction with the environment
- evolution occurs by a process of natural selection and accounts both for biodiversity and how organisms are all related to varying degrees



### **Practical Work:**

Practical work is at the heart of biology. Questions in the written exams will draw on the knowledge and understanding students have gained by carrying out the practical activities. These questions will count for at least 15% of the overall marks for the qualification. Many of our questions will also focus on investigative skills and how well students can apply what they know to practical situations often in novel contexts.

### **Mathematics skills required:**

- demonstrate an understanding of number, size and scale and the quantitative relationship between units
- use estimations and explain when they should be used
- carry out rate calculations for chemical reactions
- calculate with numbers written in standard form
- calculate cross-sectional areas of bacterial cultures and clear agar jelly using  $\pi r^2$
- use a scatter diagram to identify a correlation between two variables

### **The format for the terminal exam is:**

GCSE exams in Biology include questions that allow students to demonstrate:

- their knowledge and understanding of the content developed in one section or topic, including the associated mathematical and practical skills or
- their ability to apply mathematical and practical skills to areas of content they are not normally developed in or
- their ability to draw together different areas of knowledge and understanding within one answer.

A range of question types will be used, including multiple choice, short answer and those that require extended responses. Extended response questions will be of sufficient length to allow students to demonstrate their ability to construct and develop a sustained line of reasoning which is coherent, relevant, substantiated and logically structured. Extended responses may be prose, extended calculations, or a combination of both, as appropriate to the question.

<b>Paper 1:</b>	<b>Paper 2:</b>
<b>What's assessed:</b> Topics 1 – 4: Cell biology; Organisation; Infection and response; and Bioenergetics.	<b>What's assessed:</b> Topics 5 – 7: Homeostasis and response; Inheritance, variation and evolution; and Ecology.
<b>How it's assessed:</b> <ul style="list-style-type: none"><li>• Written exam: 1 hour 45 minutes</li><li>• Foundation and Higher Tier</li><li>• 100 marks</li><li>• 50% of GCSE</li></ul>	<b>How it's assessed:</b> <ul style="list-style-type: none"><li>• Written exam: 1 hour 45 minutes</li><li>• Foundation and Higher Tier</li><li>• 100 marks</li><li>• 50% of GCSE</li></ul>
<b>Questions:</b> Multiple choice, structured, closed short answer and open response	<b>Questions:</b> Multiple choice, structured, closed short answer and open response