AQA A Level Biology

Vision statement - Our vision is to develop curious, scientifically literate and independent biologists who understand the complexity of living systems and can apply biological knowledge to real-world challenges. Students will develop the practical, mathematical, analytical and evaluative skills needed for further study and careers across biology, medicine, healthcare, biotechnology and environmental science.

Intent - Our AQA A Level Biology curriculum is designed to develop curious, scientifically literate and independent biologists who understand how biological systems function from the molecular and cellular level through to organisms, populations and ecosystems. Students are encouraged to explore the complexity of living organisms, evaluate scientific evidence and appreciate how biological knowledge contributes to advances in medicine, agriculture, biotechnology and environmental sustainability.

The curriculum is carefully sequenced to build secure knowledge and understanding across AQA's core areas of biological science. Students develop their understanding of biological molecules, cell structure, transport across membranes, DNA and genetic information, biodiversity, evolution and ecosystems before applying this knowledge to more complex biological processes. Across the two years, students study energy transfers in biological systems, communication and homeostasis, genetics, populations, gene expression, biotechnology, respiration, photosynthesis and the responses of organisms to their environment.

Students develop the ability to apply biological knowledge to unfamiliar contexts, interpret experimental data and use quantitative skills to solve biological problems. Particular emphasis is placed on analysing graphs, tables and statistical information, identifying patterns and trends, evaluating conclusions and explaining biological processes using precise scientific terminology. Students learn to make connections between different areas of the specification, recognising that biological processes are interdependent rather than isolated topics.

Practical science is embedded throughout the curriculum. Students develop competence in planning investigations, using laboratory equipment safely and accurately, identifying variables, collecting reliable data and evaluating experimental procedures. Required practical activities provide opportunities to develop microscopy, biological measurement, sampling, chromatography, enzyme investigations, osmosis, respiration and photosynthesis skills, while reinforcing the importance of accuracy, validity, reliability and risk assessment.

The curriculum promotes independent scientific thinking through regular retrieval practice, extended-response questions, unfamiliar applications and analysis of scientific data. Students are encouraged to challenge explanations using evidence, recognise the limitations of experimental findings and communicate scientific ideas clearly. By the end of the course, students should be able to combine detailed biological knowledge with practical, mathematical and evaluative skills, providing a strong foundation for further study and careers in biological science, medicine, healthcare, biotechnology and environmental science.

Why study Biology at The Sixth Form at Ridgewood?

- Studying Biology A level will enable you to look more closely at the biochemistry, genetics and evolution of a range of organisms. Biology literally means 'the study of life' and if that's not important, what is?
- Being such a broad subject, you're bound to find a specific area of interest, plus it opens the door to a fantastic range of interesting careers.
- One of our largest departments, the Science team boasts ten teachers and three technicians. Within this, Biology is our biggest team of specialist teachers. Their interests range from biochemistry to genetics and inheritance, so whatever your passion there will be someone in our team who shares it!
- We have three specialist post-16 laboratories in Faraday where the majority of teaching takes place, one for each of Biology, Chemistry and Physics.
- During your studies on the Biology course at Ridgewood, you will get to carry out a variety of practical activities including glucose calibration, heart dissections and gel electrophoresis.
- Former alumni of the Biology department at Ridgewood have progressed to study medicine, biomedical science, radiography, zoology, pharmacology, biochemistry, neuroscience and dentistry.

What topics will I study in this subject?

Topic	What this means
Biological molecules	Explore the fundamental building blocks of organisms – the molecules of which their cells are composed.
Cells	Cells are the fundamental unit of life. Cells have certain basic features and yet show remarkable diversity in both structure and function. Within this module you will discuss the structure of the plasma membrane and the passage of substances across it by passive and active transport.
Organism exchange substances with their environment	All cells and organisms exchange material between themselves and their environment. In this unit you will discuss single celled organisms, insects, plants and mammals.
Genetic information and variation	Look at DNA, mRNA and tRNA. You will discuss how each molecule is used in protein synthesis and will also focus on the diverse range of species and how to classify different organisms.
Energy transfers in and between organisms	Organisms require a constant input of energy to maintain their highly ordered structures and systems. Within this module you will discuss how ATP is produced in photosynthesis and respiration. You also discuss nutrient cycles and how nitrogen and phosphorus are recycled.
Organisms respond to changes in their environments	There are two forms of coordination in most multicellular animals – nervous and hormonal. Within this module you will look at both in detail to explain how drugs and diseases affect the nervous and hormonal system.
Genetics, populations, evolution and ecosystems	Individuals of a species share the same genes but usually have different combinations of alleles of these genes. An individual inherits alleles from their parent or parents; this process is universal. However, the way in which the alleles interact to produce new characteristics of the new individual depends on the type of inheritance involved. Within this module you will investigate different methods of inheritance, genetic diagrams, natural selection and disease.
The control of gene expression	At a cellular level, control of metabolic activities is achieved by regulating which genes of the genome are transcribed and translated, and when this takes place. Within this module you will discuss how the environment has an effect on our genome as well as how cancer is caused and regulated.

What skills will I need in this subject?

Skill	What this skill involves in this subject
AO1 –Recall/ remember facts	You should be able to recall and remember knowledge and understanding taught in lessons of scientific ideas, processes, techniques and procedures. For example, you may be asked to describe the sequence of a scientific process or describe a method that could be used to obtain reliable results.
A02 – Application of knowledge	Apply knowledge and understanding of scientific ideas, processes, techniques and procedures. This may be when discussing a theory, in a practical context or when handling both qualitative and quantitative data. This assessment objective often asks you to apply your knowledge and understanding of a topic to an unfamiliar scenario.
A03 – Scientific principles	Analyse, interpret and evaluate scientific information, ideas and evidence. This assessment objective assesses whether you can use scientific principles to form conclusions and judgements using information that is given or may need to be processed. You may also need to adapt methods for practical investigations to acquire more reliable results.

What will my lessons involve?

Biology lessons at Ridgewood will contain a variety of different tasks to suit all learners' needs. Examples of activities you will undertake include:

- Fact recall quizzes
- Hands on practical activities
- Paired discussions
- Group work
- Research tasks
- Teacher-led worked examples
- Teacher-led lecture style delivery of content
- Exam question practice and guidance through this • Opportunity to ask questions.

We also strive to give you regular written feedback on classwork so that you know exactly how to improve and achieve a better grade.

What will my independent study involve?

- For every hour you spend in a Biology lesson, one hour of independent study is expected. This may take the form of:
  - Cornell notes
  - Flash cards
  - Exam questions
  - Essay preparation
  - Retrieval grids
  - Researching practical activities
  - Researching content prior to the lesson it is to be taught
    Responding to your teacher's marking and feedback.
- You are expected to complete extra reading to help support your writing of the essay in Paper 3

How will I be assessed?

Percentage exam assessment: 100%	Percentage coursework assessment: 0%

Assessment	Details of assessment
Paper 1	Any content from topics 1-4, including relevant practical skills. It is a written exam worth 91 marks. 76 marks are gained from a mixture of long and short answer questions, 15 marks are gained from extended response questions. Paper 1 is worth 35% of your overall A level grade. This exam is two hours long.
Paper 2	Any content from topics 5-8, including relevant practical skills. It is a written exam worth 91 marks. 76 marks are gained from a mixture of long and short answer questions, 15 marks are gained from comprehension questions. Paper 2 is worth 35% of your overall A level grade. This exam is two hours long.
Paper 3	Any content from topics 1-8, including relevant practical skills. It is a written exam worth 78 marks. 38 marks are gained from structured questions, including practical techniques; 15 marks are gained from critical analysis of given experimental data; 25 marks are gained from one essay from a choice of two titles. Paper 3 is worth 30% of your overall A level grade. This exam is two hours long.

How do I know this is the right course for me?

- A level Biology is a challenging and enjoyable A level. The demands of the course are high and the progression from GCSE to A level is very difficult. However, those students who are motivated and determined relish this opportunity and have achieved their full potential.
- Courses which work well with Biology include Maths, Chemistry, Physics, Psychology and Sociology
- Current students say:

  “A level Biology is interesting, but it is much more difficult than GCSE. Lots of people find it easier at GCSE and therefore choose to take it, but you need to invest time in it to do well”

  “A level Biology opens up so many doors to different careers”

  “If I could re-do Year 12, I would tell myself to be more organised and use my independent study time more wisely. I would have then found my exams in summer more manageable”