



BIOLOGY

Why is the study of GCSE Biology important?

Biology is the branch of Science which endeavours to explore and gain understanding of the complex and diverse wonders of living organisms within the natural world, looking at origin, morphology, physiology, anatomy, behaviour and distribution. It is one of the three Sciences that underpins most, if not all, scientific understanding. The lines between the three Sciences can cross and with this are 'bridging' sciences such as biophysics, biochemistry and bioengineering.

The key focus of Biology is achieving an understanding of a wide range of what scientists describe as 'phenomena'. In developing an understanding of this phenomena, Biology has led to the discovery and production of materials, structures, processes and devices. The contribution that Biology has made has led to the manufacture of life-saving and life-improving devices such as artificial heart valves, intraocular devices, dental implants and hip replacements; diagnostic aids such as DNA probes that can determine the species of bacteria that has caused infection to looking at controlling hormone production to aid growth of specific plant species.

Biology will be taught in a way to develop curiosity about the natural world. The curriculum will develop insight into how science works and a full appreciation of its relevance to our everyday lives. The scope and nature of studying biology will be broad, practical and relevant. It is our vision to encourage students to be inspired, motivated and challenged by science and its contribution to society.

Across your study you will explore cell structure, organisation, infection and response, bioenergetics, homeostasis ecology, inheritance selection and evolution. You will develop an appreciation of how these topics are essentially interlinked. Lessons will provide a wide range of opportunities for practicals, demonstrations and modelling of complex theories that surround us in our everyday lives. Your Science classroom will be brimming with practicals where you will learn to formulate hypotheses, analyse data and write conclusions. You will engage with ideas such as the scientific process and how throughout history this process has led to some of the greatest scientific discoveries. Seems challenging - you are going to love it! Biology will expand your mind!

Big Questions

- What is the structure and function of cells? Why is mitosis and meiosis important for life?
- How do photosynthetic reactions and aerobic and anaerobic respiration formulate life on Earth?
- What variation occurs when gametes fuse at fertilisation?
- What is metabolism?
- How is life sustained by the recycling of all molecules between the living world and the environment?

What skills will the study of Biology teach you?

You are a citizen in this world and you need to know how the natural and modern world works. It will teach you to:

- Understand theories that explain phenomena
- Apply basic ideas and models that support understanding
- Evaluate models and theories
- Present theories in mathematical form
- Recall quantitative relationships
- Derive quantitative relationships between various measured quantities
- Explain how theories are borne out by experiment
- Apply experimental procedure and understand that it is a measure of success of a theory
- Present, interpret and evaluate experimental data
- Apply mathematical skills to solve problems
- Develop a deeper understanding of everyday experiences including the natural world and modern devices.

What will you know and understand from your study of Biology?

- Develop scientific knowledge and conceptual understanding of Biology
- Develop understanding of the nature, processes and method involved in Biology
- Develop and learn to apply observational, practical, modelling, enquiry and problem-solving skills, both in the laboratory, in the field and in other learning environments
- Develop your ability to evaluate claims linked to Biology through critical analysis of the methodology evidence and conclusions, both qualitatively and quantitatively

How does your study of Biology support your study in other subjects?

Study of any subject in our curriculum takes full advantage of links with other subject areas- we term these as interdisciplinary links and we make the most of them because we know that deep learning requires the transference of knowledge and skills from one topic of learning to another. Once you can transfer your learning across topics and subject areas then you are really mastering what you know and how to apply your understanding and skills.

Biology touches on so many other subjects such as Chemistry, Physics, Physiology and Health Care. You will learn methods of thinking and research that are widely applicable to other subject areas helping your thinking in all subjects. As a Science, Biology relies heavily upon evidence to test predictions and theories. Through developing mathematical techniques as well as applying reasoning your skills to present and justify information can be applied to most careers and further education.

Across the teaching of subjects, teachers will make reference to your learning in other areas such as Mathematics, Physics and Chemistry and this will help you to develop your understanding.

How are you assessed in Biology?

Throughout the 2 year Biology course you are assessed using the following assessment objectives which ensure that you can cumulatively build your subject understanding in preparation for future GCSE and A Level study. There are regular assessment points each year that we term Praising Stars©. At GCSE we make informed predictions informed by our holistic assessment of your progress against the key assessment objectives and your aspirational GCSE targets. These are also the basis for any appropriate support and intervention.

Key Assessment Objectives

AO1: Demonstrate knowledge and understanding of:

- Scientific ideas
- Scientific techniques
- Scientific procedures

AO2: Apply knowledge and understanding of:

- Scientific ideas
- Scientific enquiry
- Scientific techniques and procedures

AO3: Analyse information and ideas to:

- Interpret and evaluate
- Make judgements and draw conclusions
- Develop and improve experimental procedures.



Can Biology support your future?

Of course, we offer the study of GCSE and A Level Biology/BTEC Applied Human Biology/WJEC Medical Science/BTEC Forensic Science and T levels in Health (in our Post 16 academies) and we encourage your continued study in this fantastic subject. Biology is offered at most prestigious universities either as a single honours or a joint honours subject studied alongside other disciplines e.g. English literature. The very fact that you have been able to study Biology, your analytical thinking and mathematical reasoning will help your future application be they for: colleges, universities, apprenticeships or employment. All Science Level 2 (GCSE) and Level 3 (Post 16) are facilitating subjects, they are highly sought after by employers and universities.

Careers that the study of Biology supports include:

- Medicine/Nursing/Dentistry/Veterinary
- Marine Biology
- Geneticist/Genomicist
- Nanotechnology
- Biostatistician
- Science journal editor
- Law

GCSE Biology Curriculum Progression Pathway

Current Y7/8 (24+)		Science KS3 Curriculum 24+				
		Y7		Y8		Subject Key
Autumn	HT 1	Introduction to Science (KS2 Recap/Getting ready for KS3)		Plants, Ecology & Climate Change	Forces	
	HT 2	Matter & Energy		Chemical Reactions		Chemistry
Spring	HT 1	Chemical Substances		Cells, Reproduction and Inheritance		Physics
	HT 2	Animal Organ Systems		Waves		
Summer	HT 1	Space, Earth & Sustainability		Electromagnetism and Electricity		
	HT 2	Plants, Ecology & Climate Change		Patterns & Materials		

The Y9 timelines are individualised by academy depending on pathways and tiers. The timeline has specialist rotations, the general timeline is below.

Current Y9 (24+)		Science KS3/KS4 Transition Year		Subject Key
		Y9		
Autumn	HT 1	End of KS3 Assessments	Health & Disease	Biology
	HT 2	C1 - Atomic structure	B1 - Cell biology	Chemistry
Spring	HT 1	B1 - Cell biology	P1 - Energy	Physics
	HT 2	C2 - Bonding & structure	B2 - Organisation	
Summer	HT 1	B2 - Organisation	C2 - Bonding & structure	
	HT 2	P2 - Electricity	B3 - Infection & response	

The Y10 timelines are individualised by academy depending on pathways and tiers. The timeline has specialist rotations, the general timeline is below.

Y10/11 (24+)		KS4 GCSE Science 24+					
		Y10			Y11		
Subject		Bi	Ch	Ph	Bi	Ch	Ph
Autumn	HT 1	B4 - Bioenergetics	B/C4 - Quantitative Chemistry/ Chemical Change	P3 - Particle model of matter	B7 - Ecology	C9/C10 - Atmosphere and resources	P8 - Space (Triple Only)
	HT 2	B5 - Homeostasis	C5 - Energy Changes	P4 - Atomic structure	Paper 2 Assessments		
Spring	HT 1	Paper 1 Assessments & Gap fill					
	HT 2	B6 - Inheritance	C6 - Rates of reaction	P5 - Forces	Masterclasses		
Summer	HT 1	B7 - Ecology	C7 - Organic Chemistry	P6 - Waves	Masterclasses		
	HT 2	B7 - Ecology	C8 - Analysis	P7 - Electromagnetism	Exams		

Current Y11 (24)		KS4 GCSE Science 24		
		Y11		
Subject		Bi	Ch	Ph
Autumn	HT 1	B6 - Inheritance	C6/C7 - Rates of Reaction/ Organic Chemistry	P5/P6 - Forces/ Waves
	HT 2	Paper 1 Assessments		
Spring	HT 1	B7 - Ecology	C8/C9/C10 - Analysis/-Atmosphere/ Resources	P7/ P8 - Electromagnetism/ SSpace (Triple only)
	HT 2	Paper 2 Assessments		
Summer	HT 1	Exams		
	HT 2			