



Curriculum Intent

Biology is the study of living organisms including their structure, functioning, evolution, distribution, and interrelationships. It affects everyone, and biologists work to find solutions to many of the world's problems. The GCSE Biology curriculum gives students the opportunity to:

- Develop scientific knowledge and conceptual understanding of Biology.
- Develop understanding of the nature, processes and methods of Biology through different types of scientific enquiries. These help them to answer scientific questions about the world around them.
- 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 their ability to evaluate claims based on Biology through critical analysis of the methodology, evidence and conclusions, both qualitatively and quantitatively.

Autumn Term | Inheritance, variation & evolution

Students will learn:-

- How characteristics are passed from parents to their offspring.
- About the process of evolution.
- How living organisms are classified.

What does excellence look like?

Being able to demonstrate relevant and comprehensive knowledge and understanding and being able to apply this to familiar and unfamiliar contexts using accurate scientific knowledge.

e.g.

- Explain how the finch species on the different Galapagos Islands are evidence for evolution by natural selection.
- Apply knowledge of speciation to explain why dodos were only found on one island.
- Being able to critically analyse data to draw logical and well evidenced conclusions and being able to judge the validity of scientific conclusions.

e.g.

- Analysis of data about antibiotic resistance.

How will we assess impact?

- Peer and self-assessment
- Previous lesson recap quiz
- Land mark tasks
- End of topic test

Knowledge, understanding & Skills

Be able to describe the work of Mendel, its importance and explain why his work was not recognised until after his death.

Be able to construct Punnett squares for monohybrid crosses and use them to make predictions using the theory of probability.

Be able to carry out a genetic cross to show how sex is inherited.

Know what the term variation means and its causes.

Be able to describe the process of evolution by natural selection and the steps involved in speciation.

Be able to describe the process of selective breeding and explain its impact on food plants and domesticated animals.

Know the stages in the process of genetic engineering and explain the potential benefits and risks of genetically modified organisms.

Be able to describe how cloning may be carried out and explain the potential benefits and risks in agriculture and medicine.

Be able to describe the work of Darwin and Wallace and understand why Darwin's ideas caused controversy when published.

Know that other hypotheses about evolution have been proposed and why these have been rejected.

Be able to describe the evidence for evolution including fossils and antibiotic resistance in bacteria.

Be able to describe factors which may contribute to the extinction of a species.

Be able to use information given to show understanding of the Linnaean system of classification and describe the impact of developments in biology on classification systems.

How is homework used to enhance learning?

BBC bitesize

<https://www.bbc.co.uk/bitesize/examspecs/zpgcbk7>

Physicsandmathstutor

<https://www.physicsandmathstutor.com/biology-revision/gcse-aqa/>

Seneca learning

<https://senecalarning.com/en-GB/>

Freescience lessons

<https://www.freesciencelessons.co.uk/videos>

Suggested homework tasks

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



Students will learn:-

- About the structure and functioning of ecosystems.
- How humans can impact ecosystems.

Knowledge, understanding & Skills

Be able to describe levels of organisation within ecosystems and the importance of competition and interdependence within communities. Be able to explain how changes in biotic and abiotic factors can affect communities.

Be able to explain how organisms are adapted to live in their natural environment.

Know how to use transects and quadrats to determine the distribution and abundance of species in an ecosystem.

Be able to describe the differences between the trophic levels of organisms within an ecosystem.

Be able to construct accurate pyramids of biomass from appropriate data.

Be able to explain what puts limits on the number of organisms at each trophic level.

Know how water and carbon are cycled in an ecosystem.

Be able to explain the importance of decay to gardeners and farmers and how various factors affect the process.

Be able to evaluate the impact of environmental changes on the distribution of species in an ecosystem.

Know that the future of the human species on Earth relies on us maintaining a good level of biodiversity.

Be able to describe the effects humans have on land, air and water.

Be able to describe some of the biological consequences of global warming.

Be able to describe both positive and negative human interactions in an ecosystem and explain their impact on biodiversity.

What does excellence look like?

Being able to demonstrate relevant and comprehensive knowledge and understanding and being able to apply this to familiar and unfamiliar contexts using accurate scientific knowledge

e.g.

- Explain why interdependence is important in maintaining a stable community.
- Apply factors which affect the rate of decay to real life situations (e.g., compost making, preserving food).
- Being able to critically analyse data to draw logical and well evidenced conclusions and being able to judge the validity of scientific conclusions.

e.g.

- Analysis of data showing predator prey relationships

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How will we assess impact? (3D)

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- End of topic test

Summer | Food Security

Students will learn:-

- How food production can be made more efficient.

Knowledge, understanding & Skills

Be able to describe some of the biological factors affecting levels of food security.

Know and explain how food production from livestock can be made more efficient.

Know and explain why fish stocks must be maintained at a sustainable level.

Be able to describe and explain some possible biotechnical and agricultural solutions, including genetic modification, to the demands of the growing human population.

How will we assess impact? (3D)

- Peer and self-assessment
- Previous lesson recap quiz
- Land mark tasks
- End of topic test

International Opportunities**Within the curriculum**

The GCSE Biology curriculum is designed to deepen understanding and appreciation of how the International scientific society collaborates and makes decisions about world scientific issues.

Students are encouraged to research each theme beyond lessons, exploring topical international scientific examples.

Classwork and homework is designed to ensure that they can draw upon a worldwide knowledge of skills, techniques and theoretical understanding required for their examinations and the potential further study of Biology at an International level at global universities.

What does excellence look like?

Being able to demonstrate relevant and comprehensive knowledge and understanding and being able to apply this to familiar and unfamiliar contexts using accurate scientific knowledge.

e.g.

- Consider whether malnutrition is just a problem in developing countries.
- Explain in detail why, in terms of food production efficiency, it is a good idea to reduce meat in the diet or replace it with insects.
- Being able to critically analyse data to draw logical and well evidenced conclusions and being able to judge the validity of scientific conclusions.

e.g.

- Interpreting population and food production statistics to evaluate food security.

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