



## 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 | Infection and Response & Bioenergetics

### Students will learn:-

- About communicable diseases in plants and animals.
- How humans defend themselves against pathogens
- About bioenergetics.

### 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.

Explaining why viruses are always pathogens, but not all bacteria are.

Use knowledge and understanding of the effect of limiting factors on the rate of photosynthesis in explanations of glasshouse design.

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.

Evaluate the advantages and disadvantages of counting bubbles to measure the rate of photosynthesis.

### Knowledge, understanding & Skills

Know how various plant and animal communicable diseases are spread, their symptoms and treatments.

Understand how the spread of these diseases can be reduced.

Be able to explain how the body defends itself against the entry of pathogens.

Understand the role of the immune system in defence against disease.

Understand how vaccinations work and how they reduce the spread of pathogens.

Be able to explain the use of antibiotics and other medicines in treating disease and the concerns about their overuse.

Be able to describe the process of discovery and development of potential new medicines, including preclinical and clinical testing.

Be able to describe photosynthesis as an endothermic reaction in which energy is transferred from the environment to the chloroplasts by light.

Be able to explain the effects of various factors on the rate of photosynthesis.

Be able to investigate, experimentally, how light intensity affects the rate of photosynthesis and calculate the rate.

Know how plants use glucose.

Be able to describe the process of cellular respiration.

Be able to compare the processes of aerobic and anaerobic respiration.

Understand how the body reacts to the increased demand for energy during exercise.

### How will we assess impact?

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

### How is homework used to enhance learning?

BBC bitesize

<https://www.bbc.co.uk/bitesize/examspecs/z8r997h>

Seneca learning

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

Freescience lessons

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

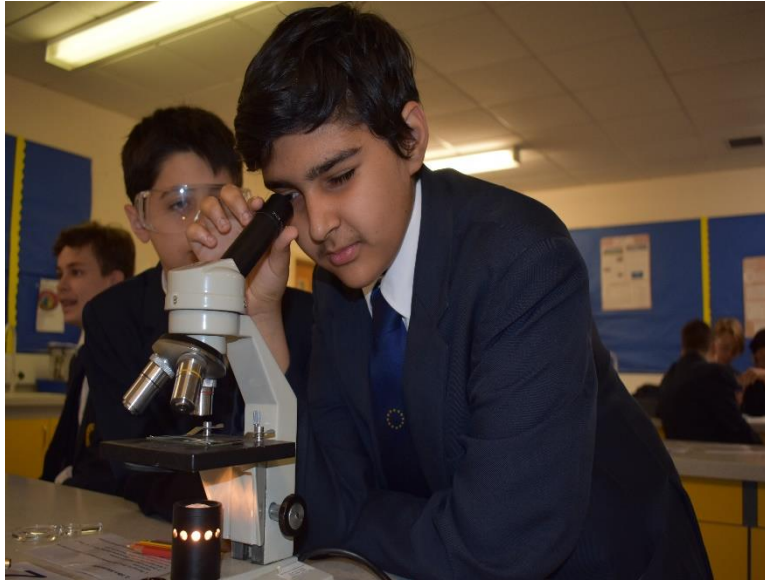
Suggested homework tasks

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



## Students will learn:-

- About the organisation and functions of the nervous system.
- About the role of hormones in control and coordination.
- About reproduction



## 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.

- Apply knowledge of synapses to explain the effects of some drugs.
- Explain some of the effects of multiple sclerosis on the body.

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 blood glucose levels.

## How is homework used to enhance learning?

BBC bitesize

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

Physicandmathstutor

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

Seneca learning

<https://senecalearning.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.

## Knowledge, understanding & Skills

Know what is meant by homeostasis and explain its importance.

Know about the role of the nervous system in homeostasis.

Be able to explain how the structure of the nervous system is related to its function.

Be able to plan and carry out an investigation into the effect of a factor on human reaction time.

Be able to describe the principles of hormonal coordination and control by the human endocrine system.

Be able to identify the position of various endocrine glands and describe the roles of the hormones they produce.

Know how blood glucose concentrations are monitored and controlled by the pancreas.

Be able to describe the roles of hormones in human reproduction, including the menstrual cycle.

Be able to evaluate the different hormonal and non-hormonal methods of contraception.

Understand how hormones can be used in modern reproductive technologies to treat infertility.

Be able to explain the roles of thyroxine and adrenaline in the body.

Understand how thyroxine levels are controlled by negative feedback.

Be able to compare and contrast sexual and asexual reproduction and describe the advantages and disadvantages of each.

Describe in outline the process of meiosis and its importance in sexual reproduction.

Be able to describe the structure of DNA and define genome.

## How will we assess impact? (3D)

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



## International Opportunities

### Visits Programmes

- Glass bottom boat tour
- Astronomy workshop in school.
- Technik Museum Speyer - incl. Blue Planet IMAX movie
- Shanghai
- Oriental Pearl Tower
- Yuyuan Garden

### 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.