



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 | Cell Biology

Students will learn:-

- About the structure of eukaryotic and prokaryotic cells
- How new cells are produced
- How substances move in and out of cells

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 an amoeba living in freshwater has a contractile vacuole.
- Explain the adaptations found in effective exchange surfaces.

Being able to critically analyse data to draw logical and well evidenced conclusions.

e.g.

- Data about changes in mass of plant material immersed in solutions of different concentrations.

How will we assess impact?

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

Knowledge, understanding & Skills

Know the differences between prokaryotic and eukaryotic cells and be able to give examples of each.

Understand the scale and size of cells.

Be able to make order of magnitude calculations, including the use of standard form.

Know some of the organelles that are present in eukaryotic cells and the function of these organelles.

Know the similarities and differences between plant and animal cells.

Be able to use a light microscope and be able to recognise, draw and interpret images of cells.

Know how various cells are adapted to their function.

Understand that cells differentiate to become specialised as an organism develops.

Understand how microscopy techniques have developed over time and how this has led to a better understanding of subcellular structures.

Know what happens during each stage of the cell cycle including mitosis.

Know what a stem cell is, their role in the growth and development of plants and animals and their potential use for treating some medical conditions.

Be able to evaluate the practical risks and benefits, as well as social and ethical issues, of the use of stem cells in medical research and treatments.

Know and explain that substances can enter and leave cells by diffusion, osmosis and active transport and be able to describe the differences between these processes.

Be able to calculate and compare surface area to volume ratios and use these to explain the need for exchange surfaces and transport 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://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 principles of organisation in organisms.
- About the human digestive system, respiratory system and circulatory system.

Knowledge, understanding & Skills

Know how specialised cells become organised into tissues and how several tissues work together to form an organ.

Know the sites of production and roles of amylase, proteases and lipases in the digestive system, also the role of bile.

Be able to use the lock and key theory and other models to explain enzyme action.

Understand how the activity of enzymes is affected by pH and temperature.

Know how to test for the main food groups using standard food tests.

Know the structure and functioning of the human heart and lungs, including how the lungs are adapted for gaseous exchange.

Be able to explain how the structure of arteries, veins and capillaries are adapted to allow them to perform their function.

Be able to identify different blood cells and understand how these blood cells are adapted to their function.

Know what happens in coronary heart disease and evaluate the methods for its treatment.

Be able to describe the relationship between health and disease and the interactions between different types of disease.

Be able to explain the effects of lifestyle factors on the incidence of non-communicable diseases.

Know what a tumour is and the difference between benign and malignant tumours.

Be able to explain how the structures of some plant tissues and plant organs are related to their function.

Understand the role of xylem and phloem in transport in plants.

Understand how factors can affect the rate of transpiration and be able to calculate rates of transpiration.

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.

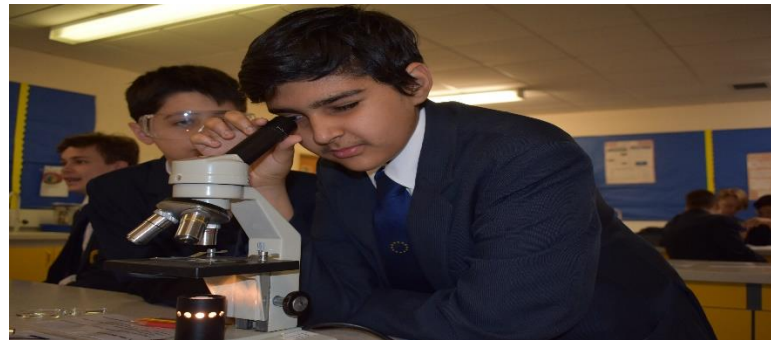
e.g.

- Explain why it is important to bring down the temperature of someone with a high temperature.
- Explain why the stomata of water lilies are on the top of their leaves and always open.

Being able to critically analyse data to draw logical and well evidenced conclusions.

e.g.

- Analysis of results from enzyme investigations in order to evaluate the method and the validity of conclusions.

**How is homework used to enhance learning?**

BBC bitesize

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

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Suggested homework tasks

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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**

- Cruise guided visit on the River Rance
- "Fontaine les Vaucluse – water mills
- La Camargue – marshes vegetation.
- Roussillon – ochre ridge.
- Senckenberg Museum – National History Museum.
- "Physics lesson in school.
- Science Museum"
- "Lake Como – Villa Carlotta and botanical gardens in Tremezza + Villa Monastero in Varenna
- Science and tech museum
- Arese - historical museum Alfa Romeo"
- "Science museum - foucault's pendulum
- Biology - botanical gardens"
- "Alcázar – guided tour and Camera Obscura
- Tarifa harbour - Whale watching
- Arcos - visit to El Rancho Cortesano (Bee/Honey Museum) - workshop"

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.