



IBH Level Biology – L6

Curriculum Intent

Biology is the study of life and biologists attempt to understand the living world at all levels using many different approaches and techniques. At one end of the scale is the cell, its molecular construction and complex metabolic reactions. At the other end of the scale biologists investigate the interactions that make whole ecosystems. The IBS Biology curriculum gives students the opportunity to:

- acquire and apply knowledge, methods and techniques that characterize Biology and technology
- develop an ability to analyse, evaluate and synthesize biological information
- develop experimental and investigative scientific skills including the use of current technologies
- become critically aware, as global citizens, of the ethical implications of using science and technology
- develop an appreciation of the possibilities and limitations of science and technology

“Nothing in life is to be feared, it is only to be understood. Now is the time to understand more, so that we fear less” Marie Curie

Students will learn: -

Autumn Term – Term 1

- ✓ Core material (see IBS curriculum map)
- ✓ How vascular plants transport water, mineral ions and organic compounds.
- ✓ How plants grow.
- ✓ How flowering plants reproduce.
- ✓ About the structure and function of the mammalian kidney.

Spring Term – Term 2

- ✓ Core material (see IBS curriculum map)
- ✓ How insect excretion compares to excretion in mammals.
- ✓ The role of enzymes in metabolic pathways
- ✓ Nucleic acids
- ✓ The roles of the musculoskeletal system

Summer Term – Term 3

- ✓ Core material (see IBS curriculum map)
- ✓ The biochemistry of cell respiration
- ✓ The biochemistry of photosynthesis

What does excellence look like?

- ✓ Having a good proficiency in solving biological problems, including those that are challenging or unfamiliar.
- ✓ Being able to select and apply relevant information, concepts and principles in a wide variety of contexts including the unfamiliar e.g.

Term 1:

- Explain adaptations of desert animals to conserve water.
- Explain the importance of guttation and hydathodes to the survival of many aquatic plants.

Knowledge, understanding & Skills

Term 1:

- ✓ How the structure of xylem and properties of water allow water to be transported from roots to leaves.
- ✓ How water enters and leaves a plant.
- ✓ How plants are adapted to desert and saline soils.
- ✓ How plants transport organic compounds from sources to sinks.
- ✓ How phloem sieve tubes are adapted for their function.
- ✓ How plants are adapted to desert and saline soils.
- ✓ The role of meristems, mitosis, cell division and auxin in the growth of plants.
- ✓ The response of plants to the environment by tropisms.
- ✓ The involvement of gene expression and day length in flowering.
- ✓ How the kidney functions as an organ of osmoregulation and excretion.

Term 2:

- ✓ Methods for treating kidney failure.
- ✓ The excretory system of insects.
- ✓ How and why enzyme inhibition occurs.
- ✓ How the structure of DNA is ideally suited to its function
- ✓ The process of DNA replication including the enzymes involved
- ✓ The regulation of gene expression
- ✓ tRNA-activating enzymes illustrating enzyme-substrate specificity.
- ✓ The stages of translation.
- ✓ The 4 levels of organisation to protein structure.
- ✓ The role of antagonistic pairs of muscles in the movement of insect legs.
- ✓ The sliding filament theory of muscle contraction.

Term 3:

- ✓ The stages of respiration; glycolysis, link reaction, Krebs's cycle and oxidative phosphorylation.
- ✓ The structure of mitochondria and how they are adapted to their function.
- ✓ The light dependent stage and light independent stages of photosynthesis
- ✓ The structure of chloroplasts and how they are adapted to their function.

What does excellence look like? (contd)

Term 2:

- Suggest why a surprisingly low number of genes were found in the human genome project.
- Suggest reasons for rigor mortis occurring.

Term 3:

- Explain how some herbicides work.
- Explain why dinitrophenol, used in munitions factories in the First World War, led to weight loss in workers.

How will we assess impact?

- Peer, self and teacher assessment in lessons
- Previous lesson recap quiz
- Teacher questioning
- Landmark tasks
- End of Topic tests
- PPE examinations at the end of the L6, mid U6, combined with mini-PPEs during the year



How can you enhance your learning at home?

- ✓ Bioninja
- ✓ Bioknowledgy
- ✓ AES student science website
- ✓ Royal Society of Biology

Suggested homework tasks

- Learn spelling and definitions of key terms.
- Explore group and independent research projects
- Past examination questions practice
- Practical activity preparation, simulations
- Processing and analysis of data from practical activities



International Opportunities

Visits Programme

Potential opportunities to engage in science in exchange partner schools exploring different approaches to science and teaching methods

Weeklong visit to FSC Orierton, Wales for fieldwork

Community lectures on International themes

International day across the school

Primary research using student cultural diversity

Within the curriculum

The Biology IBS Level curriculum is designed to deepen understanding and appreciation of how our International society makes decisions about world scientific issues. Students can compete in the International Biology Olympiad.

Students are encouraged to research each theme beyond lessons and set work to ensure that they can draw on a worldwide knowledge of the skills, techniques and theoretical understanding required for the further study of Biological Sciences at an International level at global universities