



IBS Level Biology – U6

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

Biology, meaning the science of all life, is a late notion – Leon Kass

Students will learn: -

Autumn Term – Term 1

- ✓ About the structure and functioning of ecosystems.
- ✓ How humans impact ecosystems.
- ✓ About the structure and function of the digestive system, blood system and gas exchange system in humans.
- ✓ How the body defends itself against disease,

Spring Term – Term 2

- ✓ About the structure and function of the nervous system.
- ✓ About the role of hormones in the body.
- ✓ About the evidence and mechanism for evolution.
- ✓ How organisms are classified.

What does excellence look like?

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

Term 1:

- Explain how some autoimmune diseases can affect the nervous system.
- Explain why the use of mitochondrial DNA is uniquely useful in tracing human history.

Knowledge, understanding & Skills

Term 1:

- ✓ The distribution of species in relation to abiotic and biotic factors.
- ✓ Community structure as an emergent property of an ecosystem.
- ✓ The interactions between species within a community.
- ✓ The use of models to represent energy flow in an ecosystem.
- ✓ The process of primary succession.
- ✓ The effect of alien species in ecosystems.
- ✓ The process and consequences of biomagnification.
- ✓ Methods to assess environmental conditions.
- ✓ Conservation methods.
- ✓ The role of enzymes in digestion.
- ✓ The structure of the wall of the small intestine in relation to its function.
- ✓ The structure and functioning of the heart.
- ✓ How the structure of the blood vessels adapts them to their function.
- ✓ The process of blood clotting.
- ✓ The role of phagocytes and lymphocytes in defending the body.
- ✓ Ventilation and gas exchange in humans.
- ✓ The causes and consequences of some lung diseases.

Term 2:

- ✓ The structure of neurones.
- ✓ How nerve impulses are transmitted.
- ✓ The use of hormones when signals need to be widely distributed.
- ✓ The role of insulin and glucagon in the control of blood glucose levels.
- ✓ The role of thyroxin, leptin and melatonin in body functioning.
- ✓ The role of sex hormones in prenatal development and during puberty.
- ✓ The role of female sex hormones in the menstrual cycle.
- ✓ The use of the fossil records and selective breeding as evidence for evolution.
- ✓ The processes of adaptive radiation and gradual divergence as evidence for evolution.
- ✓ The process of evolution by natural selection.
- ✓ The binomial system for naming organisms.
- ✓ The current system of classification which uses eight taxonomic levels.
- ✓ The use of cladistics as a method of classifying organisms.
- ✓ The use of biochemical evidence in classification.

What does excellence look like? (contd)

Term 2:

- Explain how some autoimmune diseases can affect the nervous system.
- Explain why the use of mitochondrial DNA is uniquely useful in tracing human history.

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.
- 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