



# IBH 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

- ✓ Core material (see IBS curriculum map)
- ✓ How populations change over time
- ✓ How nitrogen and phosphorous are cycled in the ecosystem
- ✓ Sexual reproduction involves the development and fusion of haploid gametes

#### Spring Term – Term 2

- ✓ Core material (see IBS curriculum map)
- ✓ How meiosis brings about variation
- ✓ How linked and unlinked genes are inherited
- ✓ How the body defends itself against infection
- ✓ Gene pools change over time

### 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:

- Evaluating methods to increase fish stocks.
- Evaluating the use of use of crop rotation.
- Assessing risks of estrogen pollution.

### Knowledge, understanding & Skills

#### Term 1:

Core IBS material plus:

- ✓ How populations change over time and the factors that affect them.
- ✓ The methods used to estimate population size.
- ✓ The role of bacteria in the nitrogen cycle.
- ✓ The phosphorous cycle and why the availability of phosphate may become limiting to agriculture in the future.
- ✓ Eutrophication and its effects.
- ✓ The processes of gametogenesis, fertilization, implantation and birth.
- ✓ The role of the placenta.

#### Term 2:

Core IBS material plus:

- ✓ The processes of independent assortment and crossing over during meiosis
- ✓ Differences between linked and unlinked genes
- ✓ Discrete and continuous variation.
- ✓ The inheritance of polygenic traits.
- ✓ The specific immune response.
- ✓ Vaccines and how these lead to immunity
- ✓ The production and use of monoclonal antibodies.
- ✓ The role of changes in allele frequencies in evolution.
- ✓ The process of speciation

Higher level material is taught in discrete HL only lessons. However, students should work on developing a sound understanding of the SL material to support this extension work.

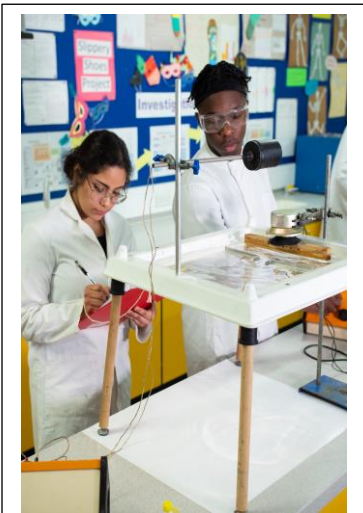
## What does excellence look like? (contd)

Term 2:

- Solving genetics problems involving epistasis.
- Explaining differences between different types of immunity.

### 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
- ✓ Bioknowledgey
- ✓ 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

Community lectures on International themes

International day across the school

Primary research using student cultural diversity

### Within the curriculum

The Biology IB 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