Sixth form website 2023

Biology HL and SL

https://www.bexleygs.co.uk/page/?title=Biology&pid=57
(Sixth form video included)

"Biology is the study of life. The first organisms appeared on the planet over 3 billion years ago and, through reproduction and natural selection, have given rise to the 8 million or so different species alive today. An interest in life is natural for humans; not only are we living organisms ourselves, but we depend on many species for our survival, are threatened by some and co-exist with many more."
IB Diploma Biology Specification

Biology is still a young science and great progress is expected in the 21st century. This progress is important at a time of growing pressure on the human population and the environment. By studying biology students should become aware of how scientists work and communicate with each other. While the scientific method may take on a wide variety of forms, it is the emphasis on a practical approach through experimental work that characterises the sciences.

Biology is an intellectually demanding subject at IB and is a big step up from the demands of GCSE. Nationally students taking GCSE Biology find the subject less hard and do better than most others, including English, Music Drama & Art, French & German, Maths and History or Geography. However at higher level (IB or A-Level) students nationally perform less well in Biology compared to English, Languages and even Chemistry & Physics. We require students to have obtained at GCSE level a grade **7, 7** in the **Combined Science** Award or '**7**' in the **Biology Separate Science** Award. The course builds upon the GCSE curriculum in terms of both depth and breadth. Students particularly notice the large quantity of material to be covered. Successful students are self-motivated and take responsibility for their learning.

The main aim of this course is to provide opportunities for scientific study and creativity within a global context which will stimulate and challenge students.

Course description

As one of the three natural sciences in the IB Diploma Programme, biology is primarily concerned with the study of life and living systems. Biologists attempt to make sense of the world through a variety of approaches and techniques, controlled experimentation and collaboration between scientists. At a time of global introspection on human activities and their impact on the world around us, developing and communicating a clear understanding of the living world has never been of greater importance than it is today.

Through the study of DP biology, students are empowered to make sense of living systems through unifying themes. By providing opportunities for students to explore conceptual frameworks, they are better able to develop understanding and awareness of the living world around them. This is carried further through a study of interactions at different levels of biological organisation, from molecules and cells to ecosystems and the biosphere. Integral to the student experience of the DP biology course is the learning that takes place through scientific inquiry. With an emphasis on experimental work, teachers provide students with opportunities to ask questions,

design experiments, collect and analyse data, collaborate with peers, and reflect, evaluate and communicate their findings.

DP biology enables students to constructively engage with topical scientific issues. Students examine scientific knowledge claims in a real-world context, fostering interest and curiosity. By exploring the subject, they develop understandings, skills and techniques which can be applied across their studies and beyond.

IB Biology falls within group 4. You will be externally assessed at the end of the course on the following theory topics for the standard or higher course.

Biology syllabus content overview

Unity and diversity	Form and function	Interaction and interdependence	Continuity and change
• Water • Nucleic acids • Origins of cells* • Cell structure • Viruses* • Diversity of organisms • Classification and cladistics* • Evolution and speciation • Conservation of biodiversity	• Carbohydrates and lipids • Proteins • Membranes and membrane transport • Organelles and compartmentalization • Cell specialisation • Gas exchange • Transport • Muscle and motility* • Adaptation to environment • Ecological niches	• Enzymes and metabolism • Cell respiration • Photosynthesis • Chemical signalling * • Neural signalling • Integration of body systems • Defence against disease • Populations and communities • Transfer of energy and matter	• DNA replication • Protein synthesis • Mutations and gene editing • Cell and nuclear division • Gene expression* • Water potential • Reproduction • Inheritance • Homeostasis • Natural selection • Sustainability and change • Climate change
Experimental programme Practical work Collaborative sciences project Scientific investigation			

* Topics with content that should only be taught to HL students

Assessment outline

Type of assessment	Format of assessment	Time (in hours)		Weighting of final grade
		SL	HL	
External Assessment		**3**	**4.5**	**80**
Paper 1	Paper 1A: Multiple-choice questions Paper 1B: Data-based questions (four questions that are syllabus related, addressing all themes)	1.5	2	36
Paper 2	Data-based and short-answer questions Extended-response questions	1.5	2.5	44
Internal		**10**		**20**
Scientific investigation	The scientific investigation is an open ended task in which the student gathers and analyses data in order to answer their own formulated research question. The outcome of the scientific investigation will be assessed through the form of a written report. The maximum overall word count for the report is 3,000 words.	10		20

Experimental programme

The IB has a strong focus on practical skills. Students at standard level are required to spend 40 hours, and students at higher level are required to spend 60 hours on **practical work**.

Students are assessed on a **scientific investigation** which they design, carry out and evaluate. This counts towards 20% of your final grade. We aim to take students on a field trip to support the ecology modules and as an opportunity to carry out coursework.

The IB programme also includes a **collaborative sciences project** which is an interdisciplinary science project addressing global issues. This typically takes 10 hours of timetabled time and results in a presentation of findings and self-reflection on your contribution to the process. The exercise should be a collaborative experience where the emphasis is developing skills in team building, negotiation and leadership.

Enrichment Opportunities

(could a link to an STEM enrichment opportunities that which outlines the STEM opportunities at sixth form - see end of document)

- Ecology based Fieldwork
- Senior Science Society
- Medicine Society
- Operating Theatre Live
- Biology Olympiad competitions
- Biology in Action

Further study

Many students take Biology-related degrees including Medicine, Veterinary science, biochemically-related degrees and a wide range of other Life Sciences courses.