



To see a world in a grain of sand
And a Heaven in a wild flower
Hold infinity in the palm of your hand
And eternity in an hour

William Blake

INTRODUCTION

This course helps students to better understand the world that they live in and the world within them. It allows an in-depth study of a wide range of biological concepts as they apply them to diversity, interactions, systems and interacting communities. The IBDP develops an understanding of biological systems.

This course is suitable for students who have a keen interest in the living world. The student should also possess good reasoning ability grounded on scientific principles. Students selecting Higher Level (HL) Biology should have done well in the 'O'-Level Biology or at the Pre-IB course having acquired a distinction for the relevant subject.

Structure of the syllabus and conceptual understanding

The biology syllabus comprises four themes, each made up of two concepts. Each theme is a lens through which the syllabus content can be viewed.

- **Theme A:** Unity and diversity
- **Theme B:** Form and function
- **Theme C:** Interaction and interdependence
- **Theme D:** Continuity and change

The arrangement of syllabus content follows four levels of biological organization, which also serve as conceptual lenses.

- **Level 1:** Molecules
- **Level 2:** Cells
- **Level 3:** Organisms
- **Level 4:** Ecosystems

The content is further arranged into topics, each with two guiding questions as signposts for inquiry. These questions help students view the content of the syllabus through the conceptual lenses of both the themes and the levels of biological organization.

Coursework (HL and SL)

The course comprises a substantial amount of laboratory based work requiring regular experimental reports throughout the two years of study. In addition, students will work on a Collaborative Sciences Project which may not be syllabus related but will not be assessed.

Assessment (HL and SL)

Internal assessment (10 hours) : 20%

The internal assessment consists of one task: the scientific investigation.

This component is internally assessed by the teacher and externally moderated by the IB at the end of the course.

(Total 24 marks)

Written Examinations (80%):

HL BIO

External assessment (4 hours 30 minutes)

Paper 1 (2 hours) : 36%

Paper 1A—Multiple-choice questions

Paper 1B—Data-based questions (four questions that are syllabus related, addressing all themes)

(Total 75 marks)

Paper 2 (2 hour and 30 minutes) : 44%

Section A—Data-based and short answer questions

Section B—Extended-response questions

(Total 80 marks)

SL BIO

External assessment (3 hours)

Paper 1 (1 hour and 30 minutes) : 36%

Paper 1A—Multiple-choice questions

Paper 1B—Data-based questions (four questions that are syllabus related, addressing all themes)

(Total 55 marks)

Paper 2 (1 hour and 30 minutes) : 44%

Section A—Data-based and short answer questions

Section B—Extended-response questions

(Total 50 marks)

University Courses and Careers

HL Biology lays the foundation for courses in 'pure sciences' and is also valuable for courses in applied sciences, Medicine, Pharmacy, Biochemistry, Microbiology, Life Sciences, Veterinary Science, Forestry, Physiotherapy, etc.

Distinction between SL and HL

Students at SL and HL share the following.

- An understanding of science through a stimulating experimental programme
- The nature of science as an overarching theme
- The study of a concept-based syllabus
- One piece of internally assessed work, the scientific investigation
- The collaborative sciences project

The SL course provides students with a fundamental understanding of biology and experience of the associated skills. The HL course requires students to increase their knowledge and understanding of the subject, and so provides a solid foundation for further study at university level.

The SL course has a recommended 150 teaching hours, compared to 240 hours for the HL course. This difference is reflected in the additional content studied by HL students. Some of the HL content is conceptually more demanding and explored in greater depth. The distinction between SL and HL is therefore one of both breadth and depth. The increased breadth and depth at HL result in increased networked knowledge, requiring the student to make more connections between diverse areas of the syllabus.

IBDP Higher Level and Standard Level Biology Syllabus Outline

Theme	Level of organization			
	1. Molecules	2. Cells	3. Organisms	4. Ecosystems
A Unity and diversity	Common ancestry has given living organisms many shared features while evolution has resulted in the rich biodiversity of life on Earth.			
	A1.1 Water A1.2 Nucleic acids	A2.1 Origins of cells <i>[HL only]</i> A2.2 Cell structure A2.3 Viruses <i>[HL only]</i>	A3.1 Diversity of organisms A3.2 Classification and cladistics <i>[HL only]</i>	A4.1 Evolution and speciation A4.2 Conservation of biodiversity
B Form and function	Adaptations are forms that correspond to function. These adaptations persist from generation to generation because they increase the chances of survival.			
	B1.1 Carbohydrates and lipids B1.2 Proteins	B2.1 Membranes and membrane transport B2.2 Organelles and compartmentalization B2.3 Cell specialization	B3.1 Gas exchange B3.2 Transport B3.3 Muscle and motility <i>[HL only]</i>	B4.1 Adaptation to environment B4.2 Ecological niches
C Interaction and interdependence	Systems are based on interactions, interdependence and integration of components. Systems result in emergence of new properties at each level of biological organization.			
	C1.1 Enzymes and metabolism C1.2 Cell respiration C1.3 Photosynthesis	C2.1 Chemical signalling <i>[HL only]</i> C2.2 Neural signalling	C3.1 Integration of body systems C3.2 Defence against disease	C4.1 Populations and communities C4.2 Transfers of energy and matter
D Continuity and change	Living things have mechanisms for maintaining equilibrium and for bringing about transformation. Environmental change is a driver of evolution by natural selection.			
	D1.1 DNA replication D1.2 Protein synthesis D1.3 Mutation and gene editing	D2.1 Cell and nuclear division D2.2 Gene expression <i>[HL only]</i> D2.3 Water potential	D3.1 Reproduction D3.2 Inheritance D3.3 Homeostasis	D4.1 Natural selection D4.2 Stability and change D4.3 Climate change