



XV. GIMNAZIJA
International Baccalaureate Department
Diploma Programme



BIOLOGY
SL & HL
COURSE OUTLINE

WHAT IS THE COURSE ABOUT?

The Biology as a subject belongs to the Group 4 of the Diploma Program. The subject is taught 5 lessons per week for HL, and 3-4 lessons per week for SL over the course of two years. The IB Diploma Program Biology course combines academic study with the acquisition of practical and investigational skills through the experimental approach. The syllabus for the Diploma Programme SL and HL Biology course can be taught following 2 different teaching strategies: teaching by **themes**, or by **units**. The approach depends on the teacher's decision and preferences.

Both courses develop scientific inquiry and practical skills. HL students study additional content, engage with topics in greater depth, and complete a larger number of teaching hours (240 hours compared to 150 hours at SL).

AIMS

The Biology course covers the essential principles of the subject and allows teachers some flexibility to tailor the course to meet the needs of their students. Throughout this challenging course, students become aware of how scientists work and communicate with each other. Further, students enjoy multiple opportunities for scientific study and creative inquiry within a global context. In addition, the course is designed to:

- provide opportunities for scientific study and creativity within a global context that will stimulate and challenge students
- provide a body of knowledge, methods and techniques that characterize science and technology
- enable students to apply and use a body of knowledge, methods and techniques that characterize science and technology
- develop an ability to analyze, evaluate and synthesize scientific information
- develop experimental and investigative scientific skills
- engender an awareness of the need for, and the value of effective collaboration and communication during scientific activities
- develop and apply the students' ICT skills in the study of science
- raise awareness of the moral, ethical, social, economic and environmental implications of using science and technology
- develop an appreciation of the possibilities and limitations associated with science and scientists

THEMES

Table 1: Syllabus roadmap

Theme	Unit (levels of organization)			
	1. Molecules	2. Cells	3. Organisms	4. Ecosystems
A - Unity & diversity	Water Nucleic acids	Origins of cells (HL) Cell structure Viruses (HL)	Diversity of organisms Classification and cladistics (HL)	Evolution and speciation Conservation and biodiversity
B – Form & function	Carbohydrates Lipids Proteins	Membranes and membrane transport Organelles and compartmentalization Cell specialization	Gas exchange Transport Muscles and motility (HL)	Adaptation to environment Ecological niches
C – Interaction & Interdependence	Enzymes and metabolism Cell respiration Photosynthesis	Chemical signaling (HL) Neural signaling	Integration of body systems Defense against disease	Populations and communities Transfer of energy and matter
D – Continuity & Change	DNA replication Protein synthesis Mutations and gene editing	Cells and nuclear division Gene expression (HL) Water potential	Reproduction Inheritance Homeostasis	Natural selection Stability and change Climate change

- the teaching sequence may vary from the one shown in the table above

ASSESSMENT

The student's official assessment consists of:

- **External Assessment** (two written Papers)
- **Internal Assessment** (experimental investigation designed and conducted by the student)

School internal assessment: Student progress is monitored through a variety of assessment methods, including unit tests, quizzes, practical laboratory work, lab reports, homework, class participation, and end-of-semester or mock examinations. These assessments provide opportunities for students to demonstrate their knowledge, understanding, practical skills, scientific inquiry, and engagement throughout the course.

Assessment objectives

The most important aim of Diploma Programme assessment is to support curricular goals and encourage appropriate student learning. The assessment objectives reflect those parts of the aims that will be formally assessed either internally or externally. These assessments will focus on the nature of science. It is the intention of these courses that students are able to fulfil the following assessment objectives an aim:

1. Demonstrate knowledge and understanding of:
 - a. facts, concepts, and terminology
 - b. methodologies and techniques
 - c. communicating scientific information.

2. Apply:
 - a. facts, concepts, and terminology
 - b. methodologies and techniques
 - c. methods of communicating scientific information.
3. Formulate, analyze and evaluate:
 - a. hypotheses, research questions and predictions
 - b. methodologies and techniques
 - c. primary and secondary data
 - d. scientific explanations.
4. Demonstrate the appropriate research, experimental, and personal skills necessary to carry out insightful and ethical investigations.

ASSESSMENT OVERVIEW

External Assessment

- Paper 1
- Paper 2

Internal Assessment

- Scientific Investigation

School Assessment

- Unit tests
- Practical work
- End-of-semester examinations
- Mock examinations

Table 2A: Grade boundaries for class tests and exams HL

	Grade boundaries HL		
Grade	Class test + Exam Paper 1a	Exam paper 1b	Exam paper 2
7	91-100%	87-100%	87-100%
6	81-90%	75-86%	71-86%
5	71-80%	65-74%	55-70%
4	61-70%	55-64%	45-54%
3	51-60%	45-54%	31-44%
2	31-50%	25-44%	20- 30%
1	0-30%	0-24%	0-19%

Table 2B: Grade boundaries for class tests and exams SL

	Grade boundaries SL		
Grade	Class test + Exam Paper 1a	Exam paper 1b	Exam paper 2
7	90-100%	87-100%	87-100%
6	80-90%	75-86%	70-86%
5	70-80%	65-74%	55-69%
4	60-70%	55-64%	45-54%
3	50-60%	45-54%	31-44%
2	30-50%	25-44%	20-30%

1	0-29%	0-24%	0-19%
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Table 3: term grades and final grades will be determined according to the table below

Semester	Component				
	Paper 1a, 1b	Paper 2	Knowledge& understanding	Class engagement	Internal assessment (lab reports)
2nd	5+10=15%	15%	50%	5%	15%
4th	5+5=10%	25%	40%	5%	20%

Official assessment

Internal assessment

The IA requirement is worth **20%** of the final assessment, consisting of one task – **the scientific investigation**.

The scientific investigation is an open-ended task in which the student gathers and analyses data to answer their own formulated research questions. 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 **3000 words**.

The research question should be of interest to the student. The scientific investigation must have sufficient depth and extent. The investigation of the research question must involve the collection and analysis of quantitative data that should be supported by qualitative observations.

The scientific investigation allows a wide range of techniques for data gathering and analysis: hands-on practical lab work, fieldwork, use of spreadsheets for analysis and modelling, extraction and analysis of data from a database, use of simulations. The investigation will be assessed against 4 criteria: **research design, data analysis, conclusion and evaluation**. Each assessment criterion has level descriptors describing specific achievement levels, together with an appropriate range of marks.

Addition to school internal assessment

During 3rd semester students should design the experiment for the IA. Teacher will provide feedback after which the student should finalize the design and start conducting the experiment. During 4th semester a draft containing **data analysis, conclusion, and evaluation** should be submitted. The teacher will assess the draft and provide comments. Both drafts might be graded (2 grades in e-dnevnik might be awarded).

The final student scientific investigation will not be graded in e-dnevnik since it needs to be upgraded after teacher's feedback. This IA form will be uploaded for external moderation.

External assessment

Students are externally assessed at the IB Finals through the final exam provided by IBO.

Table 4: external assessment details—SL

Component	Duration	Marks	Overall weighting	Format
Paper 1	1,5h	30+25=55	36%	Paper 1A: 30 multiple-choice questions on SL material. No marks are deducted for incorrect answers; 30 marks
				Paper 1B: four data-based questions related to experimental work and the syllabus; 25 marks
Paper 2	1,5h	50	44%	Section A: data-based and short answer questions on SL; 34 marks Section B: extended response questions on SL. One of two extended response questions to be chosen by candidates; 16 marks

Table 5: external assessment details—HL

Component	Duration	Marks	Overall weighting	Format
Paper 1	2h	40+35=75	36%	Paper 1A: 40 multiple-choice questions on SL and AHL material. No marks are deducted for incorrect answers; 40 marks
				Paper 1B: four data-based questions related to experimental work and the syllabus; 35 marks
Paper 2	2,5h	80	44%	Section A: data-based and short answer questions on SL and HL; 48 marks Section B: extended response questions on SL and HL. Two of three extended response questions to be chosen by candidates; 32 marks

IB Learner Profile

The course develops students as inquirers, thinkers, communicators, principled, reflective and knowledgeable through scientific investigation and inquiry.

Academic Integrity

Students are expected to uphold the principles of academic integrity in all aspects of the Biology course. All submitted work, including laboratory reports, the scientific investigation, research tasks, and assessments, must be authentic and appropriately acknowledge the ideas, data, and work of others. Students will receive guidance on ethical scientific practice, responsible data collection and analysis, and correct citation of sources in accordance with IB and XV. gimnazija Academic Integrity policies.

ATL Skills

The course clearly develops research skills, thinking skills, communication skills, social skills and self-management skills.