

IB Biology 12 (HL) 2023/2024

In IB Biology 11, you covered:

Topic 1 – Cell Biology
Topic 3 – Genetics
Topic 4 – Ecology
Topic 5 – Evolution and Biodiversity
Topic 9 – Plant biology
Topic 10 – Genetics and Evolution
Topic 2 – Water and Molecular Biology
Topic 7 – Nucleic acids

In IB Biology 12, we will cover:

Topic 2 – Enzymes
Topic 6 – Human Physiology
Topic 8 – Metabolism, Cell Respiration and Photosynthesis
Topic 11 – Animal Physiology
Option A – Neurobiology
Internal Assessment

A detailed list of all the IB Biology learning outcomes will be handed out in class.

Evaluation

Students will be assessed through a variety of assignments, labs and tests. Each topic will be weighted to reflect the number of learning outcomes that students must meet. The final IB grade will be on a 7 point scale, which reflects their exams in May of grade 12 and their internal assessments. During IB Biology 12, students will be assessed according to the IB 7-point scale, which reflects which level students are currently at with respect to the IB Biology learning outcomes. For report cards, the current estimated IB grades will be converted to a percentage based on the following chart, which has been approved by the BC Ministry of Education and adopted by BCAIBWS. Please note these numbers are for HL courses only, as SL courses use a different conversion.

Current Anticipated IB grade	Report Card %
7	98-100
6	96-97
5	90-95
4	86-89
3	76-85
2	70-75
1	0-49 (0-69?)

Resources

- Textbook: Biology 2014 Edition Allott and Mindorff
- Notes, powerpoints and videos will also be used in class
- Microsoft Teams, ClassNotebook and the on-line ManageBac program will also be used.

Expectations

Academic Integrity

PMSS's IB Academic Integrity Policy is expected to be followed at all times. Please refer to it on the school's website, and make sure you understand all of the expectations.

- You are expected to work on your own to complete all assignments. Lab partners may collect data together, but the presenting of the data, calculations, discussions and conclusions in labs write ups must be completed **independently**. Working together constitutes academic dishonesty and is a form of plagiarism that is not acceptable.
- You may not discuss tests or other assessments with other students until after EVERY student has written the assessment and you have been given explicit permission from your teacher.
- Plagiarism is not tolerated in any form. You may not use material from the internet, or print material, without referencing. Work done by a tutor and previous course work done by another person is considered plagiarism. Please see the PMSS IB Academic Honesty policy for more information.

Absences

- Please email me if you will be absent from class, so that I can outline the topics that you will need to catch up on.
- If you miss class on the day that we have an assessment, **you must have your parent email me directly that morning**. We can then set a new time for the assessment to be completed.

Deadlines

- All lab work and assignments must be landed in on time, at the beginning of class. If something needs to be printed, it must be done ahead of time, and be ready to hand in at the start of class.

Group 4 aims

Through studying biology, chemistry or physics, 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 characterizes these subjects.

The aims enable students, through the overarching theme of the Nature of science, to:

1. appreciate scientific study and creativity within a global context through stimulating and challenging opportunities
2. acquire a body of knowledge, methods and techniques that characterize science and technology
3. apply and use a body of knowledge, methods and techniques that characterize science and technology
4. develop an ability to analyse, evaluate and synthesize scientific information
5. develop a critical awareness of the need for, and the value of, effective collaboration and communication during scientific activities
6. develop experimental and investigative scientific skills including the use of current technologies
7. develop and apply 21st century communication skills in the study of science
8. become critically aware, as global citizens, of the ethical implications of using science and technology
9. develop an appreciation of the possibilities and limitations of science and technology
10. develop an understanding of the relationships between scientific disciplines and their influence on other areas of knowledge.

Assessment Objectives

The assessment objectives for biology, chemistry and physics reflect those parts of the aims that will be formally assessed either internally or externally. These assessments will centre upon the nature of science. It is the intention of these courses that students are able to fulfill the following assessment objectives:

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, analyse 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.

Component	Overall weighting (%)	Approximate weighting of objectives (%)		Duration (hours)
		1+2	3	
Paper 1	20	10	10	1
Paper 2	36	18	18	2¼
Paper 3	24	12	12	1¼
Internal assessment	20	Covers objectives 1, 2, 3 and 4		10

External assessment details—HL

Paper 1

Duration: 1 hour

Weighting: 20%

Marks: 40

- 40 multiple-choice questions on core and AHL material, about 15 of which are common with SL.
- The questions on paper 1 test assessment objectives 1, 2 and 3.
- The use of calculators is not permitted.
- No marks are deducted for incorrect answers.

Paper 2

Duration: 2¼ hours

Weighting: 36%

Marks: 72

- Data-based question.
- Short-answer and extended-response questions on core and AHL material.
- Two out of three extended response questions to be attempted by candidates.
- The questions on paper 2 test assessment objectives 1, 2 and 3.
- The use of calculators is permitted. (See calculator section on the OCC.)

Paper 3

Duration: 1 hour

Weighting: 20%

Marks: 35

- This paper will have questions on core and SL option material.
- Section A: candidates answer all questions, two to three short-answer questions based on experimental skills and techniques, analysis and evaluation, using unseen data linked to the core and AHL material.
- Section B: short-answer and extended-response questions from one option.
- The questions on paper 3 test assessment objectives 1, 2 and 3.
- The use of calculators is permitted. (See calculator section on the OCC.)



IB learner profile

The aim of all IB programmes is to develop internationally minded people who, recognizing their common humanity and shared guardianship of the planet, help to create a better and more peaceful world.

As IB learners we strive to be:

INQUIRERS

We nurture our curiosity, developing skills for inquiry and research. We know how to learn independently and with others. We learn with enthusiasm and sustain our love of learning throughout life.

KNOWLEDGEABLE

We develop and use conceptual understanding, exploring knowledge across a range of disciplines. We engage with issues and ideas that have local and global significance.

THINKERS

We use critical and creative thinking skills to analyse and take responsible action on complex problems. We exercise initiative in making reasoned, ethical decisions.

COMMUNICATORS

We express ourselves confidently and creatively in more than one language and in many ways. We collaborate effectively, listening carefully to the perspectives of other individuals and groups.

PRINCIPLED

We act with integrity and honesty, with a strong sense of fairness and justice, and with respect for the dignity and rights of people everywhere. We take responsibility for our actions and their consequences.

OPEN-MINDED

We critically appreciate our own cultures and personal histories, as well as the values and traditions of others. We seek and evaluate a range of points of view, and we are willing to grow from the experience.

CARING

We show empathy, compassion and respect. We have a commitment to service, and we act to make a positive difference in the lives of others and in the world around us.

RISK-TAKERS

We approach uncertainty with forethought and determination; we work independently and cooperatively to explore new ideas and innovative strategies. We are resourceful and resilient in the face of challenges and change.

BALANCED

We understand the importance of balancing different aspects of our lives—intellectual, physical, and emotional—to achieve well-being for ourselves and others. We recognize our interdependence with other people and with the world in which we live.

REFLECTIVE

We thoughtfully consider the world and our own ideas and experience. We work to understand our strengths and weaknesses in order to support our learning and personal development.

The IB learner profile represents 10 attributes valued by IB World Schools. We believe these attributes, and others like them, can help individuals and groups become responsible members of local, national and global communities.

Approaches to Teaching and Learning

The IB Diploma Programme Approaches to Teaching and Learning are deliberate strategies, skills, and attitude that permeate the IB Teaching and Learning environment. The IB believes that a large influence on a student's education is not only what you learn by how you learn. Teaching students how to learn will improve the quality of teaching and learning across the entire IB spectrum of programmes.

The IB approaches to learning skills are:

- Thinking skills
- Communication skills
- Social skills
- Self-management skills
- Research skills

The IB approaches to teaching skills are:

- based on inquiry
- focused on conceptual understanding
- developed in local and global contexts
- focused on effective teamwork and collaboration
- differentiated to meet the needs of all learners
- informed by formative and summative assessment.

Links to Theory of Knowledge

- In Theory of Knowledge, students will be introduced to 5 Areas of Knowledge (Language, Arts, Human Sciences, Natural Sciences and Mathematics) and 4 elements of each area of knowledge (Scope, Methods/Tools, Perspectives and Ethics). In IB Biology, we will connect to the TOK course content as we learn about the history and production of biological knowledge. We will also ask knowledge questions that relate to the content, particularly in the areas of perspectives and ethics.

International Mindedness

- Science itself is an international endeavour—the exchange of information and ideas across national boundaries has been essential to the progress of science. Indeed, the idea that science is a Western invention is a myth—many of the foundations of modern-day science were laid many centuries before by Arabic, Indian and Chinese civilizations, among others. The scientific method in its widest sense, with its emphasis on peer review, open-mindedness and freedom of thought, transcends politics, religion, gender and nationality. Increasingly there is a recognition that many scientific problems are international in nature and this has led to a global approach to research in many areas.
- Throughout the two years of IB Biology, students will be introduced to examples of international efforts working together to increase scientific knowledge and examine how scientific breakthroughs affect people in different regions of the world.