If you are reading this, probably you like biology and you are considering choosing it from the science subjects offered in IB Diploma. Or maybe you do not like biology but you happened to be reading this. Whichever is true, continue reading… Thank you.

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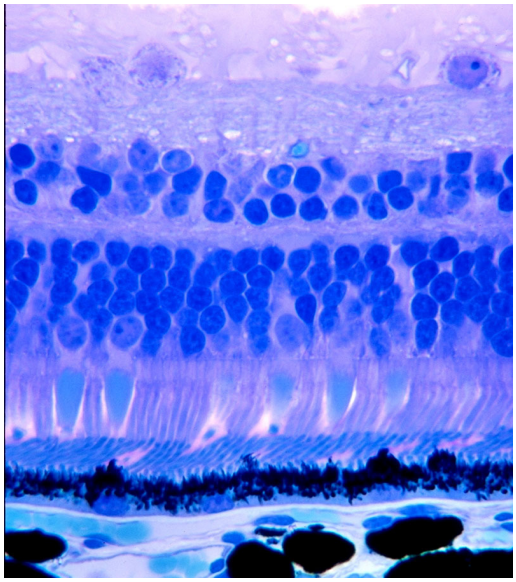
IBD Biology teacher

What is IB Diploma Biology course about?

It is about nature and living organisms and everything related, obviously:) The course is aimed at understanding the things and processes we see in nature and thinking about all these things.

When you start with IBD Biology, you actually do not need to know much biology, because it is a complete course. So we start from the very beginning – cells – step-by-step getting through biochemistry and genetics to human biology and a bit of evolution biology and ecology.

Once again, it is about *understanding*. Biology students, *naturally*, have to memorize some things but the aim of the lessons is also to see that biology and nature are almost as logical as physics or chemistry.



Take a look at the pictures above – you can find many differences between the two things shown, although both of them are used for receiving and processing information. And all the small stuff is connected in some way that makes *sense and order*. If you ever had the feeling that physicists or computer scientists are those who *understand* things and biologists are the ones who only know how things *look like*, you were, hopefully, wrong. There is much to understand in biology too.

Our biology students are expected to know, analyze and understand the nature. And understand it enough to be able to *explain* what they know. And, of course, to work hard and enjoy it at the same time :-)

What do we study?

The main topic in IBD Biology is the human anatomy and physiology. However, to understand all the processes, we need to start from the basics. So the first topic is Cell, we continue with Biochemistry (yes, you need to know some chemistry to understand biology), followed by Genetics and finally, the Human Body. The final topics are Ecology and Evolution, as we should not think the nature is all about humans.

Those, who take more lessons of biology (Higher Level - HL) do the same topics although we go into greater details. Of course, as a result, we understand more. The only extra topic at HL lessons are the Plants.

At the end of the study, we (as whole class) choose so-called Options – two extra topics out of eight offered. Usually, these are Neurobiology and Behavior, and Evolution Extra. Besides these, we also have Further Human Physiology (so HL students study 3 Options altogether), at HL.

How does this differ from biology in the national curriculum?

The IBD biology is neither better, nor worse than common high school biology. However, it is surely different and shorter. Since we have less than two years before the final exams, we focus on humans and almost completely skip the classification of animals and plants (including their anatomy and physiology). These are only taught in very limited form in the topic of Ecology and Evolution.

What do we do at the lessons?

All students are taught by the same teacher. If you take Standard Level (SL) you will have 3 lessons a week. If you choose Higher Level (HL), you will have the same 3 lessons with SL students, plus 2 extra lessons.

Most lessons are in form of being taught theory, so it is either teacher's explanations or discussion with the students. Some of the lessons are practical, which means that students do experiments/observations/ something else, which have to be written in form of lab reports made at home. The students are also expected to produce some experimental designs – to make up their own experiments (lab reports and experimental designs make cca 25% of the mark at final exams).
To do lab reports, we need to know something from 'statistical processing' but just a little of it – that should not make anyone scared :-)

Of course, we write tests. No oral exams, just writing. So the students are expected to express themselves in written English (and get better at that all the time).

BIOLOGY - SYLLABUS

The actual order of the topics at the lessons may differ. The SL topics are studied by everyone, the HL topics by the HL students only. The SL students study the core of D and E options, the HL students study all three options listed below, in full extent.

SL TOPICS:

Topic 1: Statistical analysis

Topic 2: Cells

- 2.1 Cell theory
- 2.2 Prokaryotic cells
- 2.3 Eukaryotic cells
- 2.4 Membranes
- 2.5 Cell division

Topic 3: The chemistry of life

- 3.1 Chemical elements and water
- 3.2 Carbohydrates, lipids and proteins
- 3.3 DNA structure
- 3.4 DNA replication
- 3.5 Transcription and translation
- 3.6 Enzymes
- 3.7 Cell respiration
- 3.8 Photosynthesis

Topic 4: Genetics

- 4.1 Chromosomes, genes, alleles and mutations
- 4.2 Meiosis
- 4.3 Theoretical genetics
- 4.4 Genetic engineering and biotechnology

Topic 5: Ecology and evolution

- 5.1 Communities and ecosystems
- 5.2 The greenhouse effect
- 5.3 Populations
- 5.4 Evolution
- 5.5 Classification

Topic 6: Human health and physiology

- 6.1 Digestion
- 6.2 The transport system
- 6.3 Defence against infectious disease
- 6.4 Gas exchange
- 6.5 Nerves, hormones and homeostasis
- 6.6 Reproduction

HL ONLY TOPICS:

Topic 7: Nucleic acids and proteins

- 7.1 DNA structure
- 7.2 DNA replication
- 7.3 Transcription
- 7.4 Translation
- 7.5 Proteins
- 7.6 Enzymes

Topic 8: Cell respiration and photosynthesis

- 8.1 Cell respiration
- 8.2 Photosynthesis

Topic 9: Plant science

- 9.1 Plant structure and growth
- 9.2 Transport in angiospermophytes
- 9.3 Reproduction in angiospermophytes

Topic 10: Genetics

- 10.1 Meiosis
- 10.2 Dihybrid crosses and gene linkage
- 10.3 Polygenic inheritance

Topic 11: Human health and physiology

- 11.1 Defence against infectious disease
- 11.2 Muscles and movement
- 11.3 The kidney
- 11.4 Reproduction

SL & HL OPTIONS:

Option D: Evolution

Core (SL and HL)

- D1 Origin of life on Earth
- D2 Species and speciation
- D3 Human evolution

Extension (HL only)

- D4 The Hardy- Weinberg principle
- D5 Phylogeny and systematics

Option E: Neurobiology and behaviour

Core (SL and HL)

- E1 Stimulus and response
- E2 Perception of stimuli
- E3 Innate and learned behaviour
- E4 Neurotransmitters and synapses

Extension (HL only)

- E5 The human brain
- E6 Further studies of behaviour

HL ONLY OPTION:

Option H: Further human physiology

- H1 Hormonal control
- H2 Digestion
- H3 Absorption of digested foods
- H4 Functions of the liver
- H5 The transport system
- H6 Gas exchange