

### Diploma Programme subject outline – Group 4: sciences

<b>School Name</b>	High Point Central High School	<b>School Code</b>	0875
<b>Name of DP Subject</b>	SL IB Biology		
<b>Level</b>	Higher <input type="checkbox"/> Standard completed in two years <input checked="" type="checkbox"/> Standard completed one year <input type="checkbox"/>		
<b>Name of teacher who completed this outline</b>	Brie Elking and Enkhnasan Enkhbold	<b>Date of IB Training</b>	<b>Elking:</b> July 2 <sup>nd</sup> , 2014 and Online October 7, 2015 <b>Enkhbold:</b> Online December 22, 2016
<b>Date when outline was completed</b>	12/20/2016	<b>Name of workshop</b>	DP - Biology C2

#### 1. Course outline

	Topic (as identified in the IB subject guide)  <i>State the topics in the order you are planning to teach them</i>	Contents	Allocated Time	Assessment instruments to be used	Resources  <i>List the main resources to be used, including information technology if applicable</i>
			One class is: <input style="width: 40px; text-align: center;" type="text" value="90"/> minutes  In one week there are: <input style="width: 40px; text-align: center;" type="text" value="2-3"/> classes		
Year 1	2: Molecular Biology	2.1-2.5	13 classes	Test, practice internal assessments, interactive notebooks,	Computers, scientific calculators, basic scientific equipment (balances, graduated cylinders, beakers, etc..)
	1: Cell Biology	1.1 to 1.4	10 classes		
	2: Molecular Biology	2.8 and 2.9	6 classes		
	2: Molecular Biology	2.6 and 2.7	6 classes		
	1: Cell Biology and 3: Genetics	1.6 and 3.3	6 classes		
	4: Ecology	4.1-4.4	10 classes		
Year 2	5: Evolution and Biodiversity and 1: Cell Biology	5.1-5.4 and 1.6	10 classes	Rubric-based assessment of practice internal assessments. Tests based on DBQs, short response and multiple choice. Rubric-based assessment of online class discussions	Online discussion forms, computers, basic scientific equipment and personal protective equipment
	6: Human Physiology	6.1, 6.2, 6.3, 6.4, 6.6	13 classes		
	Option A: Neurobiology and Behavior	6.5, A.1-A.3	12 classes		
	3: Genetics	3.1, 3.2, 3.4, 3.5	10 classes		

## 2. The group 4 project

As the IB guides say, “The group 4 project is a collaborative activity where students from different group 4 subjects work together on a scientific or technological topic, allowing for concepts and perceptions from across the disciplines to be shared in line with aim 10 – that is, to ‘encourage an understanding of the relationships between scientific disciplines and the overarching nature of the scientific method.’” Describe how you will organize this activity. Indicate the timeline and subjects involved if applicable.

The Group 4 project is performed collaboratively between IB Biology, IB Chemistry and IB Physics. Each group of students will consist of a mixture of disciplines with a minimum of Biology and Chemistry in every group (the IB Physics program is still growing). All of the teachers involved work together to determine an appropriate topic that can be examined within their disciplines (for example, this year we are doing Water). Teachers then determine the groups and the students work to create and present an original research project. This project begins in the middle/ end of May during the junior year. Students have 8 class periods to work on the project and 1-2 days of presentations at the start of June.

## 3. IB practical work and the internal assessment requirement to be completed during the course

Name of the topic	Experiment	Any ICT used? <i>Remember you must use all five within your programme</i>
Acid and bases	Titration	Yes
Topic 1: Cell Biology	Microscope Viewing and Magnification Calculation	Yes
Topic 2: Molecular Biology	Design lab on the factors that affect enzymes	Yes
Topic 3: Genetics	Virtual drosophila breeding experiment. Students generate their own data, conduct chi-square tests and calculate distances of gene loci.	Yes
Topic 4: Ecology	Owl Pellet dissection to examine prey availability and creation of a food pyramid	Yes
Topic 5: Evolution	Data based using BLAST and GenBank	Yes
Topic 6: Human Physiology	Comparing vital signs (respiratory rate, pulse and blood pressure) after different levels of exertion	Yes
Option A: Neurobiology and Behavior	Measuring reaction time using different types of sensory stimuli	Yes

#### 4. Laboratory facilities

Describe the laboratory and indicate whether it is presently equipped to facilitate the practical work that you have indicated in the chart above. If it is not, indicate the timeline to achieve this objective and describe the safety measures that are applicable.

**Year 1 – Rm 211:** We have 6 lab sinks and lab counters on the left side and in the back of the room. The right side of the room has windows that we use when doing the photosynthesis labs. We also have a fume hood and environmental chamber in the back of the room as well. The students sit at lab tables where they do most of their lab work. There is an attached storage area with a fridge, freezer, incubator and chemical storage. Rm 211 is equipped to do all of the labs above.

**Year 2 - Rm 313:** We have 5 lab sinks and lab counters along the right and back sides of the room. We have a fume hood in the back of the room and students work in clusters of 6 on lab tables for group activities and experiments. We have access to a laptop cart and two computer labs for conducting the virtual experiments. Our school district has access to *Canvas*, an online discussion platform, which is used for students to collaboratively investigate assigned primary research pertaining to the current unit. Room 313 is equipped with all of the necessary materials for the labs of year 2.

#### 5. Other resources

Indicate what other resources the school has to support the implementation of the subject and what plans there are to improve them, if needed.

Computers are available for online labs to supplement any that cannot be done in the classroom due to a lack of supplies.

#### 6. Links to TOK

You are expected to explore links between the topics of your subject and TOK. As an example of how you would do this, choose one topic from your course outline that would allow your students to make links with TOK. Describe how you would plan the lesson.

Topic	Link with TOK (including description of the lesson plan)
6.4 Gas Exchange	Today, it is commonly accepted that smoking can lead to numerous pulmonary disorders, such as emphysema and lung cancer. This was not the case prior to the 20 <sup>th</sup> century, and even after scientists had gathered large-scale epidemiological data, it was not enough to immediately change popular sentiment. Students will watch excerpts of a documentary called “Merchants of Doubt,” which focuses on professional skeptics hired by corporations to discredit research on issues such as climate change and adverse effects of tobacco use. Students will follow up on an issue brought up during the documentary, and share their findings in small online discussion groups, and will respond to questions and replies from classmates.

### 7. Approaches to learning

Every IB course should contribute to the development of students' approaches to learning skills. As an example of how you would do this, choose one topic from your outline that would allow your students to specifically develop one or more of these skill categories (thinking, communication, social, self-management, or research).

Topic	Contribution to the development of students' approaches to learning skills (including one or more skill category)
6.6 Hormones and Reproduction	Communication, self-management and research: After learning about the controversy over IVF and the major stances, students will independently conduct research in order to develop their own opinions. In small groups of 3-4, they will post in a discussion group and are encouraged to share their findings and thoughts on the topic. The emphasis of the activity is in effective communication in an academic environment. It is expected that students are going to disagree and will feel some frustration, so the activity is preceded by a class discussion of group norms. Students are assessed on their ability to communicate respectfully with classmates, citing reliable sources and synthesizing information to make their own argument. These activities are self-paced, with an initial post deadline in the middle of the week and the follow-up posts due by the end of the week.

### 8. International Mindedness

Every IB course should contribute to the development of international-mindedness in students. As an example of how you would do this, choose one topic from your outline that would allow your students to analyze it from different cultural perspectives. Briefly explain the reason for your choice and what resources you will use to achieve this goal.

Topic	Contribution to the development of the attribute(s) of the IB learner profile
2: Molecular Biology	We discuss global water conservation issues. We watch part of the movie "Blue Gold" and talk about droughts/ water shortages in California and Yemen and how shortages in one country can affect other countries. We also discuss international policy governing the use of water resources. To summarize the topic, we examine what we as individuals can do to conserve water in our homes and communities.

**9. Development of the IB learner**

Through the course it is also expected that students will develop the attributes of the IB learner profile. As an example of how you would do this, choose one topic from your course outline and explain how the contents and related skills would pursue the development of any attribute(s) of the IB learner profile that you will identify.

Topic	Contribution to the development of the attribute(s) of the IB learner profile
6.6 Hormones and Reproduction	Communicators, open-minded, caring, risk-takers, reflective Continuation of IVF research activity: By having a class discussion of group norms, students have the opportunity to reflect on how their words are perceived by others. Many students are initially primarily concerned with “winning” a debate, rather than seeking to understand, but this activity challenges them to consider perspectives different from their own. Others may be hesitant to share their opinions in a classroom setting, so the small group aspect of an online discussion board gives them the opportunity to synthesize their thoughts without the stress of talking in front of a large group.