# May 2015 MYP eAssessment:

# On-screen examination pilot

# Subject report for Biology

## Grade boundaries

| **Grade**: | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
|---|---|---|---|---|---|---|---|
| **Mark range**: | 0 – 19 | 20 – 39 | 40 – 50 | 51 – 62 | 63 – 73 | 74 – 84 | 85 - 120 |

## General comments

Based on comments from G2 forms and the grade award meeting, the questions on the exam were challenging but appropriate for a Year 5 candidate and allowed candidates to demonstrate a range of knowledge and skills based on the MYP objectives. The comments also indicated that the expectations of the exam were similar to those of moderation and they were clearly based on the MYP descriptors found in the criteria.

The length of the exam appeared to be appropriate for candidates who had a good foundation in biology related to the topic list. Although many candidates appeared to have a good understanding of some topics, the performance of candidates was fairly inconsistent when considered across the full exam.

The examiners also commented on the range of demand in the questions on the exam. There were a number of questions that allowed candidates to demonstrate abilities at even the lowest levels of achievement. Questions related to identification of cells, organization of cells and systems, and identification of variables allowed candidates of all abilities to earn marks and demonstrate their level of understanding. The longer response questions also allowed candidates to demonstrate skills at each level of achievement. Some candidates earned one or two marks for attempting to define terms or state examples. These questions also allowed more able candidates to reach the highest levels of achievement by discussing and evaluating ideas.

The examining team discussed the fairness of the questions, the connection to the topic list, and the relationship to the MYP science criteria. It was the consensus of the group that the questions were fair, based on the topics in the topic list, and closely linked to the objectives found in the MYP criteria descriptors at each level of achievement.

The examining team believes that candidate performance will improve in the future as schools have access to the topic list for the entire length of the MYP programme and candidates are more familiar with the objectives and command terms.

## The areas of the programme and examination which appeared difficult for the candidates

Candidates struggled with the graphing software. No candidates were able to graph the average of the 2 groups and only some of the candidates that chose the correct graph were able to complete it correctly.

For questions 4b and 4c, many candidates repeated their answer for both parts. The candidates appeared to not understand the distinction between the two questions.

Candidates struggled with extended answers (questions 6 and 8). The prompts in the questions helped the candidates organize their answers but very few candidates addressed all of the information required. Very few candidates went into the depth expected to reach the highest levels of achievement. Candidates who responded to all of the prompts generally earned at least a grade 3 while stronger candidates were able to reach higher levels.

Many candidates tried to use the shape of the cell or complexity of cells to differentiate between plant and animal cells rather than responding to the question which asked for the identification of key cell structures.

Candidates struggled to compare gills to lungs which is an unfamiliar situation presented to allow candidates to demonstrate the higher levels of achievement related to criterion A.

Many candidates struggled with the scientific design questions (criteria B and C) and very few made scientific explanations. Almost no candidates commented on safety, equipment, or range although these are requirements of criterion B (strand iv).

Many candidate responses appeared to be based more on popular media reports than on scientific understanding. An example of this was the often repeated statement that GMO food or plants cause cancer or have negative impacts on the environment. Candidates made these general comments but did not use scientific knowledge or facts to support such statements. Others quoted documentaries rather than scientific literature. While the use of popular documentaries and news stories can be an effective way to increase candidate interest, it is important to include an emphasis on evidence-based science

Candidates often struggled to answer questions according to extent or depth indicated by the command term. The marks awarded to candidates were significantly limited when candidates failed to fully respond to the requirements of the questions. Questions used prompts as a scaffold to assist candidates in responding to the complete question.

## The areas of the programme and examination in which candidates appeared well prepared

Candidates scored well on the question related to the impact of gill disease on the ecosystem and society.

Candidates were well prepared to answer questions related to scientific content but struggled to make connections or add value to the questions. As scientific knowing and understanding (criterion A) accounts for 25% of the on-screen examination, it is important for candidates to expect to answer questions that require them to reflect on the application of science and how the application interacts with given factors (criterion D). Candidates should also be prepared to answer questions related to inquiring and designing (criterion B) and questions based on processing and evaluating collected data (criterion C). The on-screen examination covers the four criteria equally so candidates should

be prepared to respond to questions related to each criterion. Incorporating a greater number of independently designed investigations in classroom practice, as well as extended writing opportunities to reflect on the impacts of science in context, will improve candidate preparation for the on-screen examination.

Candidates responded well in the criterion A questions about cells, tissues, body systems. Candidates also collected data well but unfortunately included outliers in their collected data**.**

Candidates had a good understanding of questions 1a, 1b, 3a, 3b, 4a and 7a and answered these questions well. Question 1a was related to the structure and function of all living things and most candidates were able to list 3 functions of living things. Many candidates generalized about animal cells. Question 1b asked candidates to identify cells as plant or animal and to provide a reason. Most candidates correctly identified the cells and provided support for their answer. Question 3a asked candidates to read a graph and 3b asked them to outline information presented by a graph. Most candidates were able to answer these questions correctly. Question 4a was also related to interpreting a graph and many candidates responded correctly. Question 7a presented candidates with an investigation scenario and asked candidates to identify variables and to justify their answer. Candidates were able to correctly identify independent, dependent and control variables but struggled with justification.

A large number of the candidates were able to identify plant and animal cells, organize complexity of organization, differentiate that lungs received oxygen from air and gills from water, identify variables, and use information from graphs to answer questions.

## The strengths and weaknesses of the candidates in the treatment of individual questions

Candidates were expected to use the prompts to organize their answers. Many candidates used the prompts to organize their answers and this assisted them in earning 2 to 3 marks with fairly simple responses. Candidates who did not use the prompts often failed to earn marks because they did not answer the question asked.

Candidates also used information in the prompts to start their answers. This ensured that their answers contained a basic level of information related to the topic and some candidates were able to add in-depth answers that were well structured based on the prompts.

Candidates often answered the Multiple Choice Questions and short answer questions correctly but many candidates left the extended answer questions blank.

No candidate was able to graph the two averages or correctly identify that the averages alone were required and not the recorded data as a whole sample.

## Recommendations and guidance for the teaching of future candidates

It would be beneficial for candidates to conduct student-led and designed investigations and to analyse and evaluate investigations. There should also be a focus on the justification of the hypothesis and the variables. The on-screen exam will assess all four of the criteria equally so it is critical that candidates are familiar with all of the criteria and have been provided with opportunities to practice the skills related to each of the criteria.

Candidates would benefit from more practice evaluating the application of science and writing longer responses and detailed answers.

Candidates need to be aware of the meaning and application of the command terms using the definitions in the assessment terms and appendices of the *MYP Sciences guide* (2014) and in MYP: *From principles into practice* (2014). Teachers are encouraged to use this in instructional and assessment practices.

## Recommendations and guidance regarding technology literacy within on-screen assessment

The formats and functions of the on-screen examinations highlight the fact that students often encounter complex technologies in academic and non-academic environments. Students need to be very familiar with the on-screen examinations source material formats and response formats, so it is advisable to use MYP eAssessment familiarization tools in ways that provide students multiple opportunities to understand how the interface works. Teaching and learning with other technology interfaces (for example, library databases, web-based mathematics and sciences applications, video editing software, and other creative tools) can help to build students' technology literacy as well. Students also need specific support in learning how to work with technology in *timed* situations, as most technology use in school is related to longer-term projects or more open-ended. For example, analysing a two-minute video in a classroom discussion is very different from doing so in a timed exam, which requires a number of technology literacy and affective skills. The MYP eAssessment familiarization tool can help foster students' technology literacy as well as build their skills with technology operations and functions.