



Examiners' Report
Principal Examiner Feedback

January 2023

Pearson Edexcel International A Level
In Biology (WBI16)
Paper 01: Practical Skills in Biology II

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Publications Code: WBI16_01_ER_2301

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WBI16 2301

Some general points:

Question one always asks candidates to describe a method based on a core practical they are expected to have personally carried out.

Question two can be based around any biological context, the key parts of the question are always the same, data presentation and analysis.

Question three is based on a core practical, the context should be familiar. This question focused on data processing and points of methodology.

Question four is based on a core practical.

In general candidates showed knowledge of the core practical methods. Students clearly identified variables that needed to be controlled but their descriptions as to how monitoring or control could be achieved frequently lacked the precision required for this examination. However, most students did try to tailor their answers to the context of each question.

Question 1

1a

Candidates were asked to describe a method to investigate the effect of different nitrate ion concentrations on the growth of an aquatic plant. Many descriptions of the method were logically presented. The most frequent omissions were providing a statement clearly identifying the dependent variable and a method for calculating rate of growth.

1b

Candidates were asked to describe the role of nitrate ions in cell division of growing plants. All the points on the mark scheme were regularly given by candidates. However, there was a tendency to describe details of mitosis, this was beyond the scope of this question.

Question 2

The context of this question was liquid bacterial culture.

2a

Most candidates did identify an appropriate risk to humans and a suitable method to reduce the risk.

2b

Most candidates attempted to calculate the growth constant using the formula and data provided. Candidates often gained the correct answer, however, some candidates did not give their answer to three significant figures.

2ci

Many candidates stated appropriate variables. A small number of candidates failed appreciated the difference between abiotic and biotic variables.

2cii

Many candidates described their control of a variable adequately

Question 3

This question was about investigating the response of a marine animal to stimulation by light.

3a

Most candidates provide a clear null hypothesis.

3bi

Most candidates presented a suitable table of raw data. However, a good number of candidates did not present both mean values consistently. They should have either given both means to one or two decimal places.

3bii

Nearly all the candidates presented correctly plotted and labelled graphs. Some y axis labels did not state mean time /s.

3ci

Most candidates worked through the given formula and correctly calculated the value of t . A small number of candidates used the given values of $(SA)^2$ and $(SB)^2$ and then incorrectly squared the value again.

3cii

Most candidates correctly identified the critical value from the table and compared this with the calculated value of t . The explanations that followed were usually worthy of credit.

3d

Candidates made sensible suggestions as to how the presence of opsins allowed the animal to respond to light using a reflex action. Some details about rhodopsin were not relevant to this question.

4a

The context of this question was an ecological study of the habitat of one species of grasshopper,

Candidates were asked to describe preliminary work to ensure a proposed method would work. The candidates that had engaged with the context of the investigation gave descriptions that covered at least one of the points on the mark scheme.

Candidates were not given credit for the idea of practising the method to see if it works unless they provided some specific details.

4b

Nearly all the candidates described a method of their investigation in a logical sequence. However, a significant number of answers had the potential to gain more marks by making clear statements, for example, specifying exactly how to control a variable.

All the marking points were seen regularly, however, there were only a few examples that gained maximum marks.

4c

Candidates were asked to explain how the data from their investigation would be recorded presented and analysed. Most candidates either described or drew tables with headings and graphs with labelled axes. It should be clear what type of graph is being proposed either in the drawing or in the supporting text. Only a small number of students suggested a statistical test that was not a suitable statistical test for the raw data they envisaged collecting. Tables should only have headings with units for raw data.

4d

Most candidates suggested at least one of the points on the mark scheme.

Advice for students:

- Read the whole question before you start to answer, and check that your answer covers everything the question asks for.
- Make sure your answer relates to the specific context of the question.
- When studying Core Practicals, think about what the techniques might be used for and the types of scientific question they might help to answer.
- Carry out every Core Practical for yourself, so you understand how it works and any difficulties that might be encountered.
- If you are given the procedure for a practical technique, put yourself in the shoes of the person writing the procedure: how would they have worked out the details (such as volumes, concentrations and times)? They will have used preliminary practical work.
- Consider the strengths and limitations of each Core Practical technique.
- Practice writing null hypotheses for experiments you carry out, even if you will not necessarily be applying a statistical test.

