



Examiners' Report Principal Examiner Feedback

January 2023

Pearson Edexcel International Subsidiary /
Advanced Level In Biology (WBI13) Paper 01
UNIT 3: Practical Skills in Biology I

The general standard was maintained in this series, with most students being able to attempt all questions.

Q1ai Good candidates received full marks for clear and concise answers. However, many students misinterpreted the question and thought they had to actually name the tissues. Some of these descriptions included creditable points because they went on to say why, for example, they thought it was xylem.

Q1aii Some candidates gained 3 marks here, but many students found relating longitudinal and transverse sections difficult, recognising the tissue but not ascribing the correct letter from original cross section.

Q1aiii Measuring the number of graticule units accurately caused issues for a significant minority, but many students successfully calculated diameter or radius for single mark. Using standard form for area calculation again was a challenge for many, but some laid out their working clearly.

Q1aiv Common errors were to either subtract the two values being compared or place them the wrong way round. Students were good at expressing the final answer to correct number of significant figures.

Q1av This method allowed many full mark responses. However, a significant number described the details of root tip squash preparation. The details of cutting a thin section were often not mentioned and not many understood that this is a *low power* plan.

Q1bi This question proved a challenge to some who drew a basic fried egg or a very detailed EM view, neither of which were what was asked for. Labelling was sometimes rather sloppy and quite a few simply drew a nucleus, presumably having misread the instructions. On the whole though, it was quite high scoring.

Q1bii Some students referenced what the membranes surrounded rather than giving some detail about their structures or function.

Q2a This question was well answered by the majority.

Q2bi Many candidates gained full marks. However, marks were lost for incorrect data entry or, more commonly, having a pigment column. The latter points to poor attention to what is being asked for in the question. The other common error was to miss out the word released in the y-axis column heading.

Q2bii The pattern of the graph was well described by many, but a significant number failed to ever mention permeability and were thus restricted to one mark, as hardly any mentioned variability for mp4. Again, the question was not being carefully read.

Q2biii This core practical description question was quite well answered, but many restricted themselves to just 2 or 3 marks because they had not

read the instruction to suggest how the *data provided* were obtained. Thus, for example, few talked about needing seven concentrations of the chemical.

Q2c Only mp2 was regularly awarded. Very few expressed anything that could be credited as addressing mp1, which is quite surprising.

Q3a Candidates often just referred to concentration of water rather than *free* water molecules. Few went on to address the fact that the question was designed for 2 marks with some more detail.

3bi In general this question was not all well answered, the vast majority gaining no marks. Much work needs to be done on the meanings of these terms.

Q3bii Most were able to quote a correct IV here.

Q3biii Many went in auto mode and wrote about the effect of temperature on enzymes and not water molecules. Many realised that the method or the results would not be valid for mp3, but expression was often not clear enough for mp1.

Q3ci This novel approach to examining the graph skills proved more challenging than simply being asked to plot a graph. Lines of best fit were good but the existence of a central x axis at zero was not obvious to many.

Q3cii It was pleasing to see a good number able to tackle this. Others really had no idea how to proceed.

Q3ciii This is a core practical, so it was somewhat disappointing to see many who were completely at sea as to what to do. Again, there was a split between those who were clearly in command of this skill and those who had no idea what to do.

Q3civ There were some good answers to this question and, yet again, those who really did not know what was going on.

General comments

- Reading the question carefully and giving a bit more time to interpreting what is being asked would improve candidates' answers. Also giving more detail in questions about describing methods.
- Calculations need to be laid out clearly so that credit can be given for working, even if the final answer is incorrect.
- Make sure you are very familiar with every aspect of each of the 9 core practicals and the 5 recommended practicals, any of these may form the context for questions on this paper.
- For each practical, you should consider the variables involved. The DV, the IV, and the CVs.
- It is important to remember that the DV has to be measured in some way, it needs to be quantitative. It might be a measurement on a suitable piece of equipment or maybe a count may be an appropriate measurement.
- It is very important to be familiar with the meanings of some key terms used throughout science. Accurate and valid are two cases in point in this paper.
- Mathematical skills are also important. Those required are listed in the specification in Appendix 6. A case in point on this paper was the equation for a straight line, $y = mx + c$. It is dealt with in the spec. on page 66, skill A.3.3.
- Try to think about how you might design experiments and get used to this way of thinking. In all experiments, you change a variable, the IV, and look at the effect of these changes on another variable, the DV. All other variables which may affect the DV are kept constant, these are the CVs.
- Make sure you understand what is required from each command word. For example, explain may involve some description, but what has been described must then be accounted for. Determine needs some quantitative element. Comment on needs a synthesis of factors to make a judgement.