Examiners' Report/
Principal Examiner Feedback

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IAL Biology

Unit 2: WBI03_01

Practical Biology and Research Skills

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General

Overall, the standard on this paper was in line with previous series. Poor expression was, as always, something of as hindrance to some candidates, as was poor writing. One common problem is candidates who write in a very small hand which is almost impossible to read. Knowledge of the basics of the scientific method have improved over the life of this paper, but there is still a significant minority who struggle with the minutiae of variables, reliability, validity and controls.

Question 1(a)(i)

Surprisingly over half of candidates got this wrong. The most common error was thinking that the concentration of fenitrothion was being varied.

Question 1(a)(ii)

This question was quite well answered, and much better than when a similar one was asked in the past. A good number were able to talk about a colorimeter, suggest that the solution bathing the discs was measured and what would be looked for as the reading. The most common error was a discussion of measuring the discs rather than the solution.

Question 1(a)(iii)

The vast majority were able to suggest a sensible temperature but only the more able went on to suggest that temperatures above or below this would affect the membrane or its permeability. Many were content to talk vaguely about an effect on enzymes. Candidates need to concentrate on the context in which they are writing rather than produce answers from rote learning.

Question 1(a)(iv)

A worryingly large number (over a third) scored nothing here. This was usually because they read the question as 'what should be controlled'. Of those who suggested distilled water, they were frequently unclear about keeping other relevant conditions the same as in the experiment.

Question 1(b)(i)

The graph plotting question is nearly always well done and this year was no exception, two thirds achieved full marks. Of those who did not, incomplete y-axes, lack of units on axis labels and inappropriate lines of best fit were the main issues. In regard to this last point, candidates should be encouraged to think about both the pattern they can see on the grid and the biology of what is happening in the experiment.

Question 1(b)(ii)

Attempts at this question were much better than on similar items in the past. However, there are still some issues, evidenced by the fact that fewer than a third got full marks. The easy mark was to suggest that the experiment should be repeated. After that a good number failed to say that this would allow the calculation of a mean and an SD or the generation of ranges. The most commonly lost mark was that which asked candidates to do something with their SD or error bars, simply to plot it on the graph, which is actually what the question asked for.

Question 1(c)
Most were able to make a sensible suggestion about a similarity but failed to realise that they were supposed to be looking at *trends* for the difference. In consequence, many quoted something about a specific moment in time, usually time 0.

Question 1(d)
This question was very discriminating. A significant number (a third) found it beyond them, usually because their thinking was stuck in the world of enzymes, despite the question clearly being about membrane structure. Of those who got past this barrier, few were able to put everything they had been told together and link the delay in betalain leakage with its location inside the vacuole, only 10% gained full marks.

Question 2 (a)
This was question was not well answered, with fewer than 50% gaining the mark. Many candidates saw the problem in far too general terms.

Question 2 (b)
This question was very well answered with very few problems.

Question 2(c)(i)
Again, this question was well done with candidates showing great facility in getting information from the passage.

Question 2(c)(ii)
In this case, although the information was there, candidates had to read the information a little more carefully, many did not ands thus gave benefits to farmers again.

Question 2(c)(iii)
This question was almost universally answered well.

Question 2(d)
Most candidates were able to deduce that there were fewer incidents of crop damage and fewer elephants involved in them when there was a bee fence in place. However, some were too vague and just talked about less crop damage, which is not what the data give information about. Many thus gained 2 marks. As has so often been the case in the past by not referring to the actual data at all.

Question 2(e)
This question was good discriminator, proving very difficult for some (over a third) who scored nothing. After this, a further 20% scored only one, usually by stating that there was some replication mentioned (but not linking it to reliability) or there was a control (but not linking it to validity). Too often reliability and validity were lumped together, in such phrases as 'there was a control which makes it reliable and valid'.

Question 2(f)
This question was generally well answered, although few gained full marks. This was usually due to the fact that they simply restated that farmers could gain money from sales of honey without linking this to offsetting the fence costs.

Paper Summary

In order to improve their performance students should:-

- Learn the details of the scientific method including variables, reliability, validity
- Apply the above in novel situations in preparation
- Remember that, when asked for conclusions or descriptions from or of data, manipulations of that data are normally needed to illustrate the points being made
- Note that, although sometimes it is enough to find an answer to a question in a provide passage, this sometimes may not be enough