



**General Certificate of Education (A-level)
June 2011**

Biology

BIO6X

(Specification 2410)

**Unit 6X: Externally Marked Practical
Assignment**

Report on the Examination

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General Comments

A wide range of marks was seen with all questions being correctly answered, although not on any one script. Candidates were well rehearsed in the use of statistics and demonstrated good understanding of the practical task they completed; they experienced greater difficulty, though, interpreting the data on the test.

BIO6X: Task 1

Question 1

This was answered well with the majority of candidates achieving full marks.

Question 2

Again, this question was generally well answered; most candidates achieved both marks. Those who did not missed the 'Describe how' method mark.

Question 3

Misinterpretation of this question was common with many candidates not relating it to their own investigation but designing new investigations into the effect of temperature on maggot behaviour.

Question 4

The idea of small sample size was appreciated by most candidates although not all could then relate this to not being representative of the maggot population. 'Not reliable' was often quoted. This is insufficient at this level.

Question 5

This question was generally well answered, although unacceptable answers of 'the same breed' and 'same sex' were often seen.

BIO6X: Task 2

Question 6

Many candidates achieved 5 or 6 marks for this task but there are still clear areas for improvement in this skill.

- (a) Although the majority of candidates gained the mark for a null hypothesis, expression was often weak.
- (b)&(c) Nearly all candidates selected the chi squared test and could use the statistics sheet to give a reason for their choice.
- (d) Most candidates were able to perform the calculation correctly although some did not select left and right as their two categories. Candidates who used each maggot more than once often tried to do a separate calculation for each maggot. Incorrect expected values were also seen – with maggots all expected to turn one way.
- (e) If the correct critical value was selected, candidates successfully accepted or rejected their null hypotheses. Interpretation in terms of chance and probability was less well understood. Many candidates wrote vaguely of "good" or "poor" probabilities failing to express this as more than, or less than, 0.05 or 5%. References to chance were occasionally absent.

BIO6X: EMPA Written Test Section A

Question 7

This was usually well answered although, once again, much discussion of reliability was seen – this is insufficient for this level.

Question 8

This question was generally well answered by those who did use their maggots only once (as should have been done to maximise the number of maggots observed).

Question 9

Disappointing responses were observed to this question, with many candidates simply agreeing that this was an anomaly.

Question 10

- (a) The vast majority of candidates could describe a taxis. Errors usually related the directional idea to the stimulus but not to the response.
- (b) Those candidates who did not score two marks generally lost the ‘Describe how’ method mark.

Question 11

Full marks were not uncommon on this question. The most common error was to include the forced turn and therefore miss out on the first mark.

BIO6X: EMPA Written Test Section B

Question 12

Candidates were surprisingly poor at describing a trend accurately enough to gain credit

Question 13

Some processing of the data was required to score marks here. Many candidates quoted that 50% turned one way not making it clear that, therefore, 50% turned the other way. Very few candidates could then relate this to the values expected by chance.

Question 14

The alternative mark point was the most commonly awarded. Better candidates gave good descriptions to gain full marks.

Question 15

Candidates often used **Figure 3** to gain the first mark point and related the distance between turns to the frequency of turn alternation. Few could go on to describe how this affected the overall direction of the woodlice.

Question 16

Poor levels of expression spoilt some responses –allowing time for ‘adaptation’ or ‘equilibration’ of woodlice to humidity was not uncommon. Several candidates did not appreciate that the humidity was uniform in the Petri dish so suggested that it gave woodlice time to ‘find’ an appropriate humidity.

Question 17

The majority of candidates achieved the second mark point, that correlation may be the result of other factors. Surprisingly few candidates made the statement that correlation does not mean that there is a causal link.

Question 18

Very few candidates scored all three marks here, the most common mark awarded was for the curve of best fit. Many candidates appreciated that the woodlice show variation but very few could describe how environmental factors may vary or change.

Question 19

- (a) Most candidates could complete this calculation correctly although errors in rounding and missing out the division by the original were seen.
- (b) Most candidates gave good responses with three marks not uncommon. Errors observed included discussion of temperature/respiratory rate/gas exchange changing due to clumping, and woodlice taking in water from other woodlice. Some candidates tried to use their knowledge of spiracles to answer this question rather than use the information they had been given about woodlice having gills.
- (c) Answers were often not related to differences in the initial mass.

Question 20

Many candidates were confused about low relative humidity environments and whether they were dry or moist. Also, many did not use the data from **Resource B** to state that more woodlice move in a low humidity environment. Several candidates linked low humidity to water on the gills and so decreased gas exchange.

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