



**General Certificate of Education (A-level)  
June 2012**

**Biology**

**BIO6X**

**(Specification 2410)**

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

***Report on the Examination***

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## General Comments

All students were able to access the paper – very few blank answer spaces were seen. Students who made careful use of the information given in the stem of the question were able to answer most successfully.

### Task 1

#### Question 1

- (a) Most gave good methods of selecting seeds at random such as drawing a grid and using a random number table to generate coordinates. The most frequently seen error involved selecting random numbers using a 'random number generator' – a more specific statement relating to use of a calculator or random number table was required. Some students used methods involving such activities as dropping their pens with their eyes closed. These do not result in genuinely random selection and were not credited.
- (b) Although this was very well answered by the vast majority of students, the converse question, how bias is avoided, was answered by some. This was not credited.

#### Question 2

Most students could successfully complete these calculations. Some showed confusion when inserting their actual and observed measurements into the equation they had learned.

#### Question 3

- (a) Generally very well answered with the idea of spread being most commonly seen. The weakest students gave answers referring only to 'deviation from the mean'; this was insufficient to gain the mark.
- (b) Most students gained the mark for the idea of the seeds being more widely spread from the tree but not all gave the rest of the explanation, i.e., making a statement about a wide variety of seed lengths and then linking seed length with surface area or mass and, therefore, distance blown.

### Task 2

#### Question 4

- (a) There was a sound understanding of null hypotheses although several students incorrectly stated there would be no difference between height dropped and distance travelled.
- (b) Nearly all students chose the appropriate test. Please note that mention of standard error is required to gain this mark (not just confidence limits). Spearman rank was seen very occasionally. This was not suitable as the two sets of data were not taken from the same sample.
- (c) Generally very well answered, only occasionally did students write a general statement about comparing the data – missing the idea of comparing **means**.
- (d) There was much potential for error here. Errors were seen in calculating standard deviation, in calculating standard error (using mean instead of SD in the equation for SE, or failing to use square root of n) and in calculating spread about the mean (commonly forgetting to multiply the SE by 2). More errors seemed to be made by students who calculated SD long-hand rather than using their calculator.

- (e) Most students linked overlap to acceptance/rejection of the null hypothesis and so gained one mark (although statements about the null hypothesis being 'proved correct' were seen and not credited). Many students failed to gain the second mark with a poor understanding of the idea of the probability that results occurred by chance being greater than or less than a probability of 5%.

### Written test: Section A

#### Question 5

It was necessary for students to be quite precise with this answer and give more than they had been told in the Task 2 instructions. To gain credit, they should have made reference to such features as from where on the ruler they dropped the seeds and how they maintained the seed in the same orientation each time.

#### Question 6

Some students gave generalised answers about what a plumb line is, not relating it to its importance in measuring the distance travelled, or commented on the nature of reliability. The best answers related to identifying a fixed point on the floor from which to measure the distance travelled by the seeds.

#### Question 7

This question revealed a poor understanding of collecting data in conditions where some variables cannot be controlled. Better students achieved both marks with a 'yes' answer but many students achieved one mark either for the idea of a wide range of wind speeds or for being able to calculate a more reliable mean.

#### Question 8

- (a) Well answered by the majority. Answers relating to finishing more quickly were not credited.
- (b) This part of the question was also well answered by most although answers relating to it being harder to measure the seeds were not uncommon. These were not credited.

#### Question 9

The majority gained two marks here. Occasionally students wrote about negative influences or exhaust gases improving the growth of the plants. Such answers failed to gain credit.

### Written test: Section B

#### Question 10

Most students gained the first mark for the idea of placing quadrats at intervals along the transect, although some wrote about grids and random coordinates. Few scored the second mark, failing to recognise the units on the graph so not mentioning the size of the quadrat in order to give the number of seeds per m<sup>2</sup>.

#### Question 11

- (a) Most students could identify the wind direction but not all linked the distribution with the seeds blowing further, referring instead to more seeds.
- (b) This question was generally very well answered. Only a very small number of students referred to their own investigation for mark point 3 but the other two mark points were accessible.

### Question 12

- (a) Many failed to pick out the information about the 'large number of seeds' from the stem of Resource A. Few students gained the second mark; demonstrating a poor understanding of this aspect of succession.
- (b) Again, many failed to pick out 'small seeds' from the stem of the resource or the stem of the question. Those who did frequently failed to link growth to light and photosynthesis, or to a lack of nutrients within the seed. Many wrote generalised answers about unsuccessful competition that did not gain credit.

### Question 13

- (a) Generally well done although some students wrote 'random' distribution or that 'each plot was in a different row or column', failing to point out that there was one of the seed densities concerned in each row and column.
- (b) Only the better students could appreciate the reason for arranging the plots this way. Many incorrect answers were seen relating to 'reducing competition' or 'the same conditions' or 'fair test'.

### Question 14

Some students wrote about inappropriate factors that cannot easily be controlled in the field, for example light, temperature and carbon dioxide concentration.

### Question 15

- (a) Better students gave good fluent answers here with the two main trends supported by some figures. Schools and colleges must encourage their students to look for trends – many answers were seen here describing the individual figures at great length without identifying overall patterns in the data.
- (b) Many students failed to refer to intraspecific competition. Some only wrote about competition for space. This was insufficient to gain mark point 2.

### Question 16

- (a) This question was extremely well answered by the vast majority.
- (b) Most students gained the first mark for referring to a small number of seeds but not all went on to give a further reason why not all those seeds would survive.

### Mark Ranges and Award of Grades

Grade boundaries and cumulative percentage grades are available on the [Results statistics](#) page of the AQA Website.