



**General Certificate of Secondary Education  
November 2012**

**Science B**

**SCB3FP**

**(Specification 4500)**

**Unit 3: Making My World a Better Place**

***Report on the Examination***

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## **GCSE Science B**

### **SCB3FP**

#### **Question 1 (Low demand)**

- (a) Two thirds of all students gained two or more marks on this question. Where incorrect answers were given, it was for carbon dioxide or nitrogen.
- (b) (i) There were no issues with this question and virtually all students gained the mark here.
- (b) (ii) This question was generally well answered and the common incorrect response was natural gas.
- (c) (i) There were a significant number of students who believed that lichen were indicators of water pollution. Approximately two thirds of students correctly identified fertilisers as the cause of eutrophication.
- (c) (ii) One third of students gained two marks in this question and could correctly identify the Kyoto agreement and that greenhouse gases cause more heat to be kept in the atmosphere. Where students did incorrectly identify these, there was a mix of incorrect answers.

#### **Question 2 (Low demand)**

- (a) Approximately one third of students gained two or more marks on this question, but one fifth gained no credit at all. Where mistakes were made it was often due to mixing up the roles of phagocytes and lymphocytes.
- (b) A significant number of students gained no credit on this question or did not attempt it. A common misconception that was seen was that pathogens cause clotting and many pupils simply wrote 'It is a disease'. This answer is not precise enough and could not be credited at this level.
- (c) This question discriminated well with an even number of students gaining 1, 2 or no marks.

#### **Question 3 (Low demand)**

- (a) There were no issues with this question.
- (b) This question was answered well and over 90% gained full marks for identifying advantages of selective breeding to the farmer.
- (c) Over two thirds of students could not identify a risk of selective breeding, although there was only a very small number who did not attempt the question. Most commonly students were identifying time, cost and chance it might not work as risks. Some students also stated that the cows could get a disease which is not precise enough for credit. Students would have needed to say that the risk was the higher chance that diseases would spread throughout the whole herd to gain credit for this idea.

### Question 4 (Low demand)

Overall question 4 had a high percentage of students not attempting to answer compared to the other questions in the paper. Students need to be exposed to a range of uses of smart materials and be encouraged to consider the advantages and disadvantages of these products compared to traditional products where possible.

- (a) Lack of precision in answers meant that students were often not awarded the mark in this question. 'Smart material' is insufficient to gain credit in this question. Students needed to identify that this was a photochromic material.
- (b) Over three quarters of students failed to gain marks in this question or did not attempt an answer. A common incorrect response was to state that the advantage of a superconductor was to make the train go faster or to keep the train warm inside.
- (c) Lack of precision in answers meant that students were often not awarded the mark in this question. 'Smart material' is insufficient to gain credit in this question. Students needed to identify that a thermochromic material would be needed to show the temperature of the dog via a colour change.

### Question 5 (Low demand)

- (a) (i) A significant number of students gained full credit in this question. It was clear, however, that a lack of calculators meant that some candidates only gained one mark for showing their working out. It cannot be stressed enough that candidates need to take calculators to science exams or have access to them from invigilators during the exam.
- (a) (ii) Responses to this question indicate that students have a poor grasp of how to calculate percentages and over two thirds gained no marks in this question.
- (b) (i) There were no issues with this question.
- (b) (ii) Answers to this question indicated that a significant minority of students thought that payback time was the equivalent to a loan repayment term and therefore a long payback time was seen as an advantage by some.
- (c) Responses to this question were very disappointing and students were stating possible ways of losing heat from a house that were not relevant to this house and only a small minority correctly identified conduction and convection.

### Question 6 (Low demand)

- (a) No issues with this question.
- (b) Approximately half of students gained full marks on this question, although a significant number of students thought that X-rays can easily pass through bones.
- (c) There was a range of responses to this question and a fifth of students gained two or three marks here. Where students were not gaining credit, it was often because they talked about the safety procedures for the doctor as opposed to ethical issues.

### Question 7 (Standard demand)

- (a) (i) Surprisingly a significant number of students did not correctly identify the anomalous result in the 4% alcohol concentration.
- (a) (ii) Many students correctly calculated the mean for the results at 6% alcohol concentration, but most students used the anomalous result when calculating the mean for 4% alcohol concentration.
- (a) (iii) Students were generally good at plotting the points on the graph but only a small minority gained a mark for a line of best fit. It is important that students understand the need to use a sharp pencil for graph plotting as the tolerance is  $\pm 0.5$  square. In a number of occasions there were three or four points plotted at each concentration which meant that students gained no credit.
- (b) (i) Only a very small number of students were able to attempt a percentage decrease calculation.
- (b) (ii) Students need to have practice at identifying why investigations are or are not valid. Only a small number of students could identify this conclusion as invalid due to daphnia being very different to humans or because the daphnia were immersed in alcohol unlike humans.

### Question 8 (Standard demand)

There was a range of marks credited for this question and student responses at all levels were seen. Most students could correctly identify the reduced time as a disadvantage and less steps in the process reducing the safety precautions in place. To gain credit in level 2, students needed to be able to relate these to the bigger picture advantages and disadvantages. For example, the shorter time for the process is an advantage as the drug gets to the HIV patients much faster and more lives would be saved.

### Mark Ranges and Award of Grades

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

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