



**General Certificate of Secondary Education  
June 2012**

**Science B  
(Specification 4500)**

**SCB3HP**

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

***Report on the Examination***

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## GCSE Science B

### SCB3HP

#### General Comments

A significant number of students displayed poor writing skills. Imprecise use of language often meant that the response was ambiguous and so could not be awarded the available marks. The importance of practising writing continuous prose responses to scientific questions cannot be overemphasised. A significant minority of students did not read the question carefully and follow the instructions given. Students need to practise their exam techniques and be given guidance.

It is also important to note that scripts must be legible in order for examiners to read and credit responses. Students also need to be reminded to write in black ink and not to write too small.

#### Question 1 (Standard demand / (a)(iii) High demand)

- (a) (i) Surprisingly only 40% of students were able to answer this question correctly.
- (a) (ii) All students attempted this question, but only a third gave a credit-worthy answer. Common incorrect responses referred to 'convection' as the method by which energy transfer is reduced by the silver jacket.
- (a) (iii) Most students gained the maximum 2 marks in this question. Where students did not, they were often dividing instead of multiplying when rearranging the equation.
- (b) Whilst most students gained 1 mark on this question only very few gained full credit. Where marks were gained it was for the idea of type B being a much better insulator or for the idea of savings over time. The other marking point required students to appreciate that the U-value of B was less than half that of A and therefore B was more than twice as efficient.
- (c) It was disappointing that students scored poorly on this question. To gain credit students needed to appreciate that bubble wrap has trapped air and that **air** is a good insulator.
- (d) Most students correctly stated the risk of carbon monoxide production from incomplete combustion of fuel. Relatively few identified the issue that incomplete combustion results in an inefficient use of fuel.

#### Question 2 (Standard demand)

- (a) A number of students analysed the graph and claims well, with over half of students gaining 2 or 3 marks. Sadly, no-one scored the maximum of 4 marks as accounts were invariably one sided. To gain full credit on an 'evaluate' question students must give at least one pro and one con.
- (b) (i) Approximately half of all students gained credit in this question and were able to identify the trends in the graph. Often where students did not gain credit, they stated that the females had gone up and males had come down, but

gave no indication that they understood that the prediction was based on the decreasing and increasing trends.

- (b) (ii) Many students correctly identified that changes in smoking habits could occur which would alter the prediction. However, only a very small percentage also identified that a cure or new treatment might be developed which would affect death rates.

### **Question 3 ((a), (b)(ii), (b)(iii) Standard demand / (b)(i) High demand)**

- (a) (i) Students clearly struggled to explain how an ion is formed, and over two-thirds of all students failed to gain credit here. Often imprecise use of language meant that students only gained 1 mark for the gain or loss of electrons but didn't clearly identify that it was the atoms that were gaining or losing electrons.
- (b) (i) Approximately 40% of students gained 2 marks for this question. Legibility of symbols was crucial here as examiners can only award credit for what they can see.
- (b) (ii) Over half of all students gained credit on this question.
- (b) (iii) Students struggled with this question, and there was little evidence of clear understanding about the need for the electrolyte to be aqueous.

### **Question 4 ((a) Standard demand / (b), (c) High demand)**

- (a) Very few students gave a Level 2 or 3 response, most achieving Level 1 or 2. Many students described either the process of selective breeding or the advantages to the farmer. However, Level 2 and 3 responses required students to give a full answer that addressed both aspects of the question. For a good Level 2 or Level 3 answer students needed to add value to the advantages, for example pigs with less fat will produce leaner meat which may be in more demand and therefore would produce better profits for the farmer.

Where students did describe the process of selective breeding they often missed out the need to repeat this over many successive generations resulting in exaggerated characteristics.

- (b) Imprecise use of language meant that many students failed to communicate clear and correct ideas in this question. Many students stated the advantage that you can produce lots of plants, which, whilst true, does not answer the question as you can also produce lots of plants in a traditional way. There was very little evidence of students understanding that the plantlets would be sterile and that transportation costs would be less as you can pack many in one box due to their initial size.
- (c) The majority of students gained at least 1 mark on this question. Lack of value added to advantages and disadvantages often prevented them gaining full credit. For example, they stated the need for repeated treatment as a disadvantage but didn't explain why, such as the loss of time at school or work.

### Question 5 ((a), (b) High demand / (c) Standard demand)

- (a) This question was very well answered in a number of cases, and evidenced understanding beyond the scope of the specification, such as antigen presentation. In a number of responses there was confusion over the roles of lymphocytes and phagocytes.
- (b) (i) Students struggled with this calculation of percentage decrease and only a quarter gained full credit in this question.
- (b) (ii) There were no issues with responses to this question.
- (c) (i) Many students identified one reason why people were in favour of vaccination programmes. There were very few responses linked to the idea that it is cost effective compared to treating the disease or that vaccination would reduce the risk to the population as a whole.
- (c) (ii) Most students gained credit for the possible side effects of vaccinations, but only a small number identified the concern that too many vaccinations may overload the immune system.

### Question 6 (High demand)

- (a) This question was well attempted and answered by a number of students, who gave logical accounts of the process of eutrophication. Where there were issues it was often due to confusion about the role of the algae and how this leads to the reduction of oxygen in the lake or pond.
- (b) (i) There was clear confusion demonstrated between the modes of breakdown in photo-degradable and oxo-degradable plastics and the idea of biodegradable plastics.
- (b) (ii) Many students correctly identified the reduction in the need for landfill sites as an advantage of biodegradable bags but most failed to identify a second advantage.
- (c) There were no issues with this question.

### Question 7 (High demand)

There was good evidence in this question that students have a clear understanding of the process of drug development and testing, and over half of all students gained 3 or more marks. Where accounts were incomplete it was most commonly the 'approval gained' for the release of the drug point that was omitted.

### 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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