



**General Certificate of Secondary Education
June 2012**

**Science B
(Specification 4500)**

SCB3FP

Unit 3: Making My World a Better Place

Report on the Examination

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GCSE Science B

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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 (Low demand)

- (a) Disappointingly, fewer than half of the students attained full marks on this question. Students often incorrectly identified the cathode.
- (b) (i) The vast majority of students correctly identified the metal used to electroplate jewellery and food cans. Of the few who did not achieve full marks, a significant minority incorrectly identified the metal used to electroplate food cans as 'Lead'.
- (b) (ii) Well over half of all students gained credit for this question. Incorrect answers seen included 'plugs', 'wires' and 'coins'.
- (c) The majority of students gained 1 mark here. However, imprecise use of language often meant that the response was ambiguous and could not be awarded full credit, with students failing to clearly communicate the risk of breathing in fumes to the worker.

Question 2 (Low demand)

- (a) (i) Over half of all students gained full credit on this question. Where students did have an incorrect response it was often because they stated that X-rays cannot penetrate skin or fat but can penetrate bone.
- (b) (i) A significant minority of students restated the material that would stop the radiation, ie 'thin paper', rather than giving the radiation the material would stop.
- (b) (ii) A significant minority of students restated the material that would stop the radiation ie 'thin aluminium', rather than giving the radiation the material would stop.
- (b) (iii) No issues with this question.

Question 3 (Low demand)

- (a) (i) A surprising number of students did not attempt this question or did not gain credit. Most commonly, incorrect answers stated 'bacteria'.
- (b) (i) Lack of precision in writing often meant that the response was ambiguous and so could not be awarded full credit. For example, a significant number of students stated that the number of people getting measles fell **in** 2005, which is incorrect as the number fell from 2003 **until** 2005. As a result of this, approximately one-third of all students did not gain credit in this question.
- (b) (ii) Generally there were no significant issues with this question. The most common incorrect response was 'More babies were born'.
- (c) (i) Over half of all students gained full marks on this question. Where students only gained 1 mark it was often for stating the brand name of two types of painkillers that contain the same active agent, eg 'paracetamol' and 'calpol' or 'ibuprofen' and 'nurofen'. A small number of students did state 'painkillers', which is insufficient for the mark to be awarded.
- (c) (ii) Disappointingly, three-quarters of students did not gain credit on this question, which is AO1 from the specification. A worrying number of students wrote about the dangers of overdose or addiction instead of identifying the risk of antibiotic resistance and cost to the NHS.
- (d) There was evidence that students grasp this area of the specification well, with over two-thirds gaining full credit for sequencing the process of drug testing.

Question 4 (Low demand)

- (a) Disappointingly there was a range of incorrect answers to this question relating to smart paints, superconductors and photochromic plastic. Incorrect responses included superconductors being used for dental braces and spectacle lenses.
- (b) The majority of students could identify the benefit that the thermochromic baby spoons indicate if the food is too hot, but all too often failed to link this to reducing the risk of burning the mouth of the baby. A significant number of students talked about the risk of metal spoons to young babies' gums, which whilst correct, is not relevant to the question about **thermochromic** spoons.

Question 5 ((a) Low demand / (b) Standard demand)

- (a) (i) A majority of students understood that the calculation was £30 / £60 and gained 1 mark. It was clear, however, that a lack of calculators meant that a significant number of students stated the answer as 2 instead of 0.5. It cannot be stressed enough that students need to take calculators to science exams or have access to them during the exam.
- (a) (ii) There were no significant issues with this question. Where students did not gain credit it was often due to imprecise use of language that often meant the answer was not complete. For example, students might state 'cavity walls' which is insufficient, or 'sheeps wool'.
- (b) Whilst-two thirds of students gained 1 mark on this question only a very small number 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.

Question 6 ((a) Standard demand / (b) Low demand)

- (a) Very few students at Foundation tier gave a Level 2 or 3 response, most achieving Level 1. 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.
- A small minority of students incorrectly described the processes of IVF or genetic modification instead of selective breeding.
- (b) There were no significant issues with this question.

Question 7 (Low demand)

- (a) (i) Imprecise use of language often meant that the answer was not complete. For example, students often stated ‘cars’ which is insufficient, where the correct answer would be ‘driving cars’.
- (a) (ii) One-fifth of students did not attempt this question and again imprecise use of language often meant the answer was not complete. For example, students might state ‘farming’ instead of ‘cattle farming’. A significant number stated that decomposition would cause methane, which is incorrect, and students would need to be clear that it is decomposition in anaerobic conditions that would produce methane.
- (a) (iii) One-third of students did not attempt this question.
- (b) Students struggled with this question, and there was little evidence of clear teaching about how greenhouse gases cause global warming. Many students wrote extensively about the ozone layer, which is not covered in this specification.

Question 8 (Standard demand)

- (a) A number of students analysed the graph and claims well, with over a quarter 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.

Mark Ranges and Award of Grades

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