version 1.0

General Certificate of Secondary Education June 2012

Science B (Specification 4500) SCB2FP

Unit 2: My Family and Home

Report on the Examination

Further copies of this Report are available to download from the AQA Website: www.aqa.org.uk

Set and published by the Assessment and Qualifications Alliance.

The Assessment and Qualifications Alliance (AQA) is a company limited by guarantee registered in England and Wales (company number 3644723) and a registered charity (registered charity number 1073334). Registered address: AQA, Devas Street, Manchester M15 6EX

GCSE Science B

SCB2FP

General Comments

Students and teachers should realise the importance of following the instruction to use black ink. They should also realise that if the work is illegible with poorly formed letters and numerals examiners may not be able to interpret what is written and so not be able to award marks. Where an answer space is given for numerical questions students should write their answer in the space provided: if their answer is buried in a maze of calculations it may well be missed. A calculator is essential for this unit.

Question 1 (Low demand)

It was surprising how poorly this question was done, given that the labels were provided, with only a quarter of responses gaining all 3 marks. Most students correctly identified the nucleus, fewer identified the cytoplasm and many were giving cell wall for cell membrane.

Question 2 (Low demand)

'Fossil fuel' was the only correct response given by many students, and a surprising number failed to link radioactive waste with nuclear. About a third of students gained full marks. Many of the responses appeared to be random guesses as it is difficult to see any logic to the suggested link between flooding and wood.

Question 3 (Low demand)

Very few students had much of an idea about this section of the specification, and only about a third gained the mark in each case. All of the incorrect responses were seen.

(a) 'Quicklime' was a common incorrect response to this question.

(b) 'Calcium hydroxide' was frequently given instead of the correct response of calcium oxide.

(c) Concrete was a common incorrect response.

(d) Many students chose calcium hydroxide, which is slaked lime, instead of the correct response, calcium oxide.

Question 4 (Low demand)

(a) Few students gave the role of hydrochloric acid as setting optimum conditions for stomach enzymes, gaining the softer alternative, 'breaks down food'. The second marking point was less frequently seen. A third of students gained no marks for this question.

(b) Only half of the students managed to answer this question correctly. Many students responded by rewording parts of the stem and therefore did not gain the mark. Most correct answers related to neutralisation. Students struggled to give the idea of a physical barrier, or mechanical separation of stomach lining and stomach contents.

Question 5 (Low demand)

(a) (i) This question was not well attempted, with few students gaining all 4 marks and a quarter gaining none. Many students appeared to be unaware of the receptor and its function, giving sensory neurone instead. If they did know the correct sequence of neurones, which many students did not, they went on to label the sequence one place out. The most common correct responses were sensory and motor neurone. Students were often confused about the meaning of 'receptor and effector'.

(a) (ii) Students found this question difficult, over half of the responses gaining no marks and very few gaining full marks. 'Stimulus' was often the only correct response seen. Often students wrote a long sentence for the last part without mentioning the muscle.

(a) (iii) Only about a third of students were able to supply the correct answer ('reflex').

(b) Many students did not even attempt this question. Of those who did attempt it, two-thirds gained no marks. The most commonly seen correct answer was 'hormones' for the first sentence.

Question 6 ((a), (b) (ii), (iii), (c) Low demand / (b) (i) Standard demand)

(a) Although two-thirds of students were able to gain the mark, it was surprising that a significant number think that typhoid and malaria can be inherited!

(b) (i) Very few students failed to score this mark.

(b) (ii) Students often were able to attempt this question, with suggestions of the greater density of bone, which was sufficient for the mark. Many did not then explain that since bone absorbed / blocked X-rays a paler image was produced on the film.

(b) (iii) Most students attempted this question but a surprising three-quarters failed to notice the extra finger. Polydactyly is given as an example of an inherited genetic disorder in the specification and students should be familiar with a simple explanation of its nature. Students often referred to 'joined bones' or 'bones not joined'. Other incorrect answers included 'the hand looked swollen' or 'the bones were weak', possibly as the X-ray showed lots of bones not connected so they may have assumed that one large bone had broken into lots of parts.

(c) (i) This was a very well answered question with three-quarters of students gaining all 3 marks. Students sometimes changed their minds about G or g and the resulting lack of clarity led them to make errors or made the response so uncertain that marks could not be awarded.

(c) (ii) About half of the students gained this mark.

Question 7 (Low demand)

(a) (i) This question was answered reasonably well, with most students managing to score at least 1 mark out of the 3 available. The majority got 2 marks for plotting the points correctly, though few gained the third marking point for the line of best fit. Too many of these lines were drawn dot-to-dot or not near the points on the graph. Many students also seemed to produce really thick lines or multiple lines on the graph. Some students still think a line of best fit must be a straight line.

(a) (ii) Most students gained the first mark for the 'increased angle, increased voltage' idea, which could apply to a straight line or a curve. Few students gained the second mark because they did not say that the relationship was not directly proportional (eg 'the increase in voltage was greater for increases at smaller angles').

(b) (i) Just over half of the students were able to answer this question correctly.

(b) (ii) Students often gained a mark for stating that the selected option in (b) (i) was closest to 90°, but failed to refer to graph or table to justify their answer. Two-thirds gained no marks.

Question 8 (Standard demand)

(a) This question was structured to help the student with their description of the sequence of events in the production of electricity in a power station. It was surprising how poor some of the responses were, demonstrating little knowledge and understanding of the process. A significant number of students made no attempt to answer the question. Students should be encouraged to learn that to refer to '**energy** being **made**' is incorrect.

Both the name of the part **and** its function were required for the mark.

(a) (i) A number of answers were acceptable here for the name of the part. The function was to produce steam (from water). Several students incorrectly suggested that gas from coal was produced to turn the turbine or thought that the steam came from the fossil fuel itself, eg 'turning the fossil fuel into steam'.

(a) (ii) Students needed to correctly name the turbine ('fan' is insufficient) and convey the idea of converting the movement of the steam into rotation to turn the generator. 'Move' was not accepted for 'rotate'.

Often students did give turbine, but 'fan', 'windmill' and 'condenser' were also commonly seen.

Students also struggled with the description where many believed that the turbine just spins the steam or transfers the steam to the generator, or that it was the generator. Many students also believe that the turbine creates energy, eg 'turns the steam into electricity'.

(a) (iii) Only few students were able to give an acceptable name for this part (the generator), and there were a number of incorrect responses. These included 'battery', 'transformer', 'energy box' and 'energy storer', together with other incorrectly sited power station parts.

(a) (iv) 'Stepper upper', 'power upper' and 'electricity upgrader', were among the more inventive suggestions by students who did not know the answer, even though there was a very large clue to the function given in the diagram! Fewer than a tenth of students gained this mark.

(b) (i) Most students were able to give the correct answer to this question. The small number who did not gain the mark either gave 15.96 (p) as the answer without putting the £ in front of it, or the digits they wrote were illegible. Some students obviously did not have, or use, a calculator when attempting this question.

(b) (ii) Very few students were able to calculate percentages, and those who could often failed to gain the mark because they ignored the decimal fraction and wrote '31', which is incorrect, or gave an incorrect rounding.

(b) (iii) Students who showed their working out frequently got 1 mark for calculating that the microwave cost 45p a week though some then changed this answer into 0.45p for no apparent reason. Often the calculation was not clearly laid out, meaning that intermediate stages in the calculation could not be awarded any marks. Very few students scored 4 marks. The most common wrong answer was 18, as students took the £91.80 and divided by 5.04. A significant number of students did not attempt this question, and two-thirds of those who did gained no marks.

(c) Students failed to realise that the time for a unit of electricity is 1 hour, and this resulted in completely unrealistic values for the power of the kettle. Students who did realise this often gave 30 minutes as 0.3 hours. This question was left blank by many students.

Question 9 (Standard demand)

This question was common to both tiers of paper, so should have been accessible to more able students taking this paper. It was disappointing that few students achieved above Level 2, although very few gained no marks at all. When answering Quality of Written Communication questions students need to read the question carefully and think about their response before putting pen to paper. Jotting down a brief outline could help.

Responses to this question rarely commented upon the results table, dealing only with the practical method. Good and bad points were often jumbled together because of a lack of initial thought and planning. To gain higher marks students were required to give a scientifically correct justification for the point chosen. The colour differences of the surfaces, for example, being a bad feature because black absorbs (not attracts!) heat better than the others.

Mark Ranges and Award of Grades

Grade boundaries and cumulative percentage grades are available on the **Results statistics** page of the AQA Website.

UMS conversion calculator www.aqa.org.uk/umsconversion