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General Certificate of Secondary Education March 2012

Science B (Specification 4500) SCB2HP

Unit 2: My Family and Home

Report on the Examination

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GCSE Science B

SCB2HP

General Comments

It was pleasing to see few blank spaces on many of these papers. However, some bizarre answers were seen to quite simple questions. It was noted that a number of candidates were unable to write legibly, making answers difficult to decipher. Failure to use black ink also makes some answers illegible. It is important to encourage candidates to write clearly and use only black ink. Responses that cannot be read cannot gain marks. It is surprising that candidates following a contextualised course should often display a lack of knowledge in the contextualised areas of the specification. Questions based on properties and uses of materials were often poorly attempted.

Question 1 (Standard demand)

(a) (i) A majority of students were able to gain this relatively straightforward mark. Incorrect answers included 'pylons', 'fractional distillation' and 'carbon dioxide.'

(a) (ii) 'Fission' or 'fusion' was not well known.

(b) Most candidates gave the complete answer, 'national grid', or an acceptable variant. A significant minority were unable to attempt this question.

(c) Very few candidates failed to score at least one mark on this question, with a majority scoring 2 or 3. Most candidates scored 2 marks for the age-related and distance-related points. Any valid relationship was awarded a mark. A number of candidates described the pattern of numbers rather than the relationships. The table shows the relationship between risk and age / distance for A and B and not a comparison of relative risk for A and B, as some candidates thought. It does not show that B is more common, nor does it show that there is no risk of the disease at 500 m. Candidates confused 'chance' and 'increased risk'. Often a candidate would make a correct response and then waste time and answer space giving the converse: eg 'the closer you live the greater the risk', and 'the further away you live the smaller the risk.'

Question 2 (Standard demand)

(a) Most of the candidates were able to suggest copper as the metal, and aluminium was accepted. Fewer candidates went on to give the full answer that it is used because it is a **good electrical** conductor. The question asked for one property, which meant that candidates giving more than one were likely to lose the mark because of the list principle. There was some confusion between 'ductile' and 'malleable' as properties. Surprisingly, a number of candidates suggested copper because it is 'a good insulator'. 'Gold' was seen, as was 'concrete'.

(b) This question was less well answered than 2(a) with fewer candidates giving aluminium. A number suggested 'concrete', 'wood' or 'PVC' as a result of not reading the question carefully. Even fewer gave corrosion resistance for the second mark. Rust is not an alternative to corrosion, and erosion and corrosion were sometimes confused. The property had to be reasonable for the use so light weight was ignored.

Question 3 (Standard demand)

(a) This common question was generally better answered by Higher tier candidates. The lack of structure seen in some responses would suggest that these candidates either have not carried out much practical work or have not had the opportunity to practice writing up practical work in a way which would allow the experiment to be repeated. The first test of each response was, again, to decide whether any results could be obtained from the described method. Many answers did not meet this criterion. The structure of descriptions was often poor. Candidates commonly demonstrated a lack of understanding of the terms heat' and 'temperature' and what a thermometer measures. Fewer candidates demonstrated lack of precision in their writing such as 'about 5 minutes', and 'about 5 degrees'. A number made predictions, which were not required by the question.

(b) (i) Just over half of the candidates scored marks on this question. Candidates who failed to show working and gave the incorrect answer could gain no marks, but a few who did fail at an intermediate stage did gain one or two marks for working shown. A common incorrect answer, again, was to give the inefficiency number.

(b) (ii) The most common response was that the halogen bulbs are more efficient. Many candidates failed to appreciate that the efficiency values being the same does not equate to the same light output. Just saying that halogens produce more light must be qualified with a statement indicating that the wattage is the same.

Question 4 ((a), (c), (d) Standard demand / (b), (e) High demand)

(a) About two-thirds of candidates were able to suggest a reasonable advantage.

(b) Many candidates failed to score marks for incorrect use of symbols. This is a concern which is reported repeatedly in science examinations. Upper and lower case letters must be clear, and numerals clearly subscripted or superscripted as appropriate. $CaCo_3$ is not acceptable for $CaC\underline{\mathbf{O}}_3$, nor is H2O or H^2O or H_2o acceptable for H_2O. Half of the candidates failed to score any marks on this question.

(c) (i) A majority of candidates gave sand as one answer, with water being the most common incorrect answer.

(d) Knowledge of the composition and production of concrete is poor. A number of candidates think that 'cement' is the material which comes out of a cement mixer, that is, mortar. A surprising number of candidates think that concrete is made by heating materials together. A number of candidates suggest that concrete sets by drying, which is incorrect, rather than the result of chemical reactions.

(e) It was not unexpected that few candidates scored full marks on this high-demand question. Where symbols were correctly used the state symbols were often missed out. Many candidates gave word equations for specific neutralisation reactions.

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

(a) The majority of candidates knew 'homeostasis' though there were many different versions of the spelling. The most common error was to refer to temperature control specifically.

(b) A number of candidates did not see the cue in the stem of the question which led to 'negative feedback' as the answer.

(c) A pleasing number of candidates were able to demonstrate understanding of this high-demand topic and so scored full marks. Many candidates recognised that the pancreas and liver are involved, but failed to assign the correct roles to them. A significant number of candidates suggested that insulin increases blood sugar levels. The correct spelling of 'glycogen' and 'glucagon' was essential. A common misconception was that the brain detects blood sugar level and controls the response of the pancreas.

Question 6 (High demand)

Candidates who failed to show working and gave the incorrect answer could gain no marks, but a few who did fail at an intermediate stage did gain one or two marks for working shown. A number of candidates gave the correct numerical answer but failed to give the unit while a similar number gained the unit mark having given the incorrect numerical answer. About half the candidates were unable to attempt the question.

Question 7 ((a(i)) Standard demand / (a)(ii), (b) High demand)

(a) (i) It was surprising that fewer than half of the candidates scored this mark.

(a) (ii) Identifying the differences, colour (of flowers) and the height of the plants was a straightforward task that most candidates could do. Giving the reasons for the differences was more demanding. Flower colour is clearly genetic, reinforced by the context of the question, and a majority of candidates achieved this mark. The variation in height required a deeper level of thinking and understanding, which was shown only by the more able candidates. Very few recognised that both genetics and environment were involved, and that it would be competition for light towards the centre which resulted in increased growth.

(b) To gain all five marks candidates were required to produce a reasoned explanation for the production of the white offspring including the use of the term 'allele'. Candidates often gained two marks for the Punnet square, with a third mark for identifying that 'gg' was the white phenotype. Few candidates went on to explain how they concluded that the white allele was recessive and the effect of the dominant allele on the parents' phenotype. Candidates should not qualify the term 'dominant' with 'more'.

Question 8 (High demand)

This question was an evaluation, which requires a conclusion justified by both pro and con arguments. Very few candidates gave a conclusion to their evaluation. Most candidates gave only the negative aspects of biofuel production, meaning that 3 marks was the maximum mark achievable, a common score. Candidates must realise that they have to **use** the information given, with knowledge where appropriate, to synthesise a response. Merely copying the information given wastes time and answer space and gains no marks. Few candidates grasped that the main ethical issues implied by the information given were about rainforest destruction and the consequent environmental effects, and the effect on food supplies and affordability.

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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