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General Certificate of Secondary Education March 2012

Science B (Specification 4500) SCB1FP

Unit 1: My World

Report on the Examination

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GCSE Science B

SCB1FP

General Comments

A number of candidates showed poor use of scientific terminology, which resulted in marks not being awarded. Centres need to ensure that candidates fully understand key terms and can use them during the writing of continuous prose. A significant number of candidates simply repeated information given in the question (including that given in diagrams) rather than answering the question given. A significant minority of candidates were seen to list responses to questions, often resulting in an incorrect response negating the mark. Candidates need to practice mathematical skills as listed in Section 3.7 of the specification as often these sections of the paper were not attempted.

Question 1 (Low demand)

(a) (i) There were no issues with responses to this question.

(a) (ii) A significant number of candidates incorrectly gave the response of carbon dioxide.

(b) The majority of candidates gained both marks here. Most commonly, students lost a mark by responding with the answer 'fossil fuel formation' for the first sentence. This shows a lack of understanding that living organisms involved during fossil fuel formation did not appear on Earth until the crust had cooled.

(c) (i) Less than half the candidates gave the correct response here, with an even number of incorrect responses for 'expanded' and 'heated'.

(c) (ii) The majority of candidates gained both marks here, with the most common incorrect response being 'ocean' currents.

Question 2 (Low demand)

(a) Disappointingly, many candidates did not gain full marks for this question. Candidates were frequently seen getting either Moon and Earth or Solar System and Milky Way Galaxy the wrong way round. Some candidates were also seen to get the whole sequence upside down and so failing to gain full marks.

(b) (i) The majority of candidates gave the correct response here but some candidates clearly do not fully understand the process and gave incorrect responses such as 'red shifting' or 'redder shifted'. It is important that candidates are taught to be precise in their use of scientific terms so they do not lose the meaning and therefore the mark.

(b) (ii) There were no issues with responses to this question.

(c) There were no issues with responses to this question.

Question 3 (Low demand)

(a) The majority of candidates gained the mark here, with the most common incorrect response being 'growth'.

(b) Disappointingly, less than half of the candidates gained all three marks here, with many giving contradictory answers such as 'dry' and 'moist'.

(c) Few candidates gained full marks for this question, although a significant number gained one mark. Almost no candidates mentioned 'surface area of metal'; instead many referred to 'size of metal' – which was allowed, although not an ideal response. Again, almost no-one gave the scientifically correct response of 'concentration of acid'; candidates tended to refer to 'amount of acid' – which was allowed. Many candidates incorrectly referred to 'water' or 'liquid' despite hydrochloric acid clearly being labelled on the diagram. This clearly shows that some candidates are not reading the question carefully before responding.

Question 4 (Low demand)

(a) The whole of this question was poorly answered by the majority of candidates. Many either placed the words neutrons and protons the wrong way round or guessed incorrectly.

(b) (i) Again, candidates struggled to give the correct response, with many responding by counting all the nuclear particles and giving the answer 9.

(b) (ii) Candidates found this question difficult, and many did not attempt this part at all. Although some candidates obviously understood how to do this they did not have the correct number from the previous question (eg they had counted circles in the nucleus, getting 5 or 9).

Question 5 (Low demand)

(a) (i) Disappointingly, only just over half of candidates gained the mark here. Most incorrect responses were due to candidates not being able to interpret this type of evolutionary tree data. It is important that candidates have the skills to understand how to interpret unfamiliar data formats.

(a) (ii) Although more candidates gained the mark here than that for part (i), they still clearly struggled with this data format. Some candidates also struggled to transfer the words from the diagram correctly and so lost a mark due to it being unclear whether the response was Palaeocene or Pliocene.

(a) (iii) Out of the three responses candidates performed best on this question. The most common incorrect response was for 'apes and monkeys'.

(b) Some candidates had clearly been taught about this, and discussed common names and scientific names; however, some candidates were very vague in their answers (eg. 'so they know who is who', 'it's easier to remember them' or 'so scientists can study them more easily'). Very few responses related to the need for the same scientific name regardless of language.

Question 6 (Low demand)

(a) Although almost three-quarters of candidates gave the correct sequence a significant number gave the organisms in reverse order.

(b) A disappointingly low number of candidates gained the mark here, often losing a mark for listing more than one response. Candidates must be made aware that listing on such questions may well negate a correct response.

(c) (i) As already mentioned, candidates on the Foundation paper find even simple mathematical calculations difficult and must be given practice of such calculations if they are to gain the marks in exams. Few candidates managed to gain the marks here, with the most common mistake being 1620 × 15 = 108. It was also clear that a few candidates knew how to complete the calculation but did so without the aid of a calculator and therefore did not get the right answer.

(c) (ii) Very few candidates gained full marks here. Most commonly, a mark was gained for moving or movement. It was pleasing to see a number of candidates referring to respiration. Some candidates incorrectly referred to keeping warm rather than lost as heat energy to the environment. Other candidates incorrectly referred to 'wasted energy' rather than energy in waste. A significant number of candidates incorrectly referred to energy being stored for the caterpillar to turn into a butterfly. In addition, a significant number of candidates referred to 'energy being lost in reproduction' and thus not understanding that it is not individual organisms but the organisms in a habitat's food chain that are being referred to.

Question 7 ((a), (b) Low demand / (c), (d) Standard demand)

(a) Very few candidates managed to gain marks here, with candidates most commonly incorrectly referring to wax coating reflecting the sun or to spikes protecting the plants from being eaten by predators. It was clear that such candidates had been taught cactus examples for adaptation and struggled to apply this knowledge to other plants. It is important that candidates are taught a range of different types of plants for adaptations.

(b) Generally this was answered much better than the previous question but some candidates gave answers that were too vague (eg 'to blend in with the background', which is not an advantage but a description of the term camouflage). Other vague answers included 'to protect themselves from prey'. It was also disappointing that some candidates were unable to use the terms predator or prey correctly.

(c) Very few candidates gained more than one mark on this question. Quite a few candidates simply repeated information given in the stem of the question. Quite a few candidates continued describing the camouflage of the fur and so did not answer the question correctly (eg 'polar bears are white to blend in with the snow'). Some candidates referred to surface area even though the question asks for answers relating to the 'thick fur'. Many candidates discussed other adaptations such as increased body fat, white fur for camouflage or large feet to stop sinking in the snow, which showed a clear misreading of the question. There were also many candidates who described

the fur stopping polar bears getting wet even, though the question is about the thick layer not the waterproofing of the hairs. There was also evidence of vague responses such as 'it acts like a thick coat' but without a further explanation. Some candidates incorrectly referred to fur warming the bear up by keeping cold air out rather than trapping warm air in.

(d) Very few candidates gained marks on this question. Most commonly candidates gave the incorrect response as C, then went on to incorrectly explain that it is because they are larger in size therefore can retain more heat. Some candidates misinterpreted the table figures to mean that B is a smaller organism and so did not understand what surface area to volume ratio referred to. Many candidates gave answers referring to surface area only and not surface area volume ratio even though it is mentioned in the table in the stem of the question.

Question 8 ((a) Standard demand / (b) Low demand)

(a) The QWC question was poorly answered by candidates on this paper, with few gaining many marks and most responses being only worthy of Level 1. Many candidates just described the diagram (eg 'carbon dioxide is released into the sea and then moves to the sediments then forms limestone rock'). Candidates' lack of understanding of scientific terms led to confused responses where words such as dissolve and condense were incorrectly used. Many candidates gave responses where they were clearly describing either the process of acid rain or the carbon cycle even though neither process is in Unit 1.

(b) Quite a few candidates gained at least one mark on this question. Incorrect responses included reference to humans and the amount of respiration they complete. Candidates need to be taught that an answer of 'pollution' is too vague to gain a mark and that they need to be more specific about the process that generated pollution. Some candidates referred to deforestation without referring to the burning or decomposition of these trees so could not gain the mark.

Question 9 (Standard demand)

(a) Very few candidates seem to have been taught such a basic chemical test and often described the 'pop test' for hydrogen. Some candidates incorrectly referred to carbon dioxide as extinguishing lit splints even though many other gases will also have the same effect. There were many responses that were too vague, for example 'react it with a chemical and see what comes out' and 'look for a colour change'. Some candidates incorrectly referred to the need of plants for carbon dioxide by suggesting 'put in a container with a plant to see if plant stays alive'.

(b) (i) Few candidates gained the mark here and instead referred to the cotton wool stopping gases getting out. Many candidates were aware that a gas is released but believed that it was oxygen and not carbon dioxide. Most candidates who did gain the mark achieved it for allowing the gas to escape and not for preventing the acid splashing from the flask. Some candidates incorrectly referred to it stopping 'harmful' gases escaping. A minority of candidates believed it was to stop oxygen getting in and reacting with the hydrochloric acid.

(b) (ii)/(iii) Candidates who had poor graph interpretation skills struggled to answer this question correctly. Most of those who did gain the mark did so for getting the correct time frame for the reaction to finish. Few candidates could explain their answer.

(b) (iv) Again, few candidates gained any marks on this question; those who did gain a mark achieved this for describing a gas being released. Some candidates incorrectly referred to the calcium carbonate dissolving in the hydrochloric acid (rather than reacting with it) and that it is this dissolving which results in a loss of mass.

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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