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General Certificate of Secondary Education
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Science B (Specification 4500) SCB1FP

Unit 1: My World

Report on the Examination

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Science Specification B

SCB1FP

General Comments

A significant number of candidates displayed poor writing skills. Imprecise use of language often meant that the meaning of the response was ambiguous and so could not be awarded the available marks. The importance of practicing writing continuous prose responses to scientific questions cannot be overemphasised. It is not appropriate to abbreviate answers. A significant minority of candidates did not read the question carefully and follow the instructions. Candidates need to practice their exam techniques and be given guidance. Instances will be apparent in the detailed report below. A significant number of candidates seemed unfamiliar with the elements and compounds stated in Appendix E of the specification.

Question 1 (Low demand)

(a) Surprisingly few candidates gained full marks on this question. A significant number used two lines from the same substance, so losing the mark. Many incorrectly linked salt with an element. Many candidates also incorrectly linked iron to an ion, perhaps due to similarity in spelling. Other incorrect responses included linking salt to a mixture and crude oil to a compound. Students are expected to be familiar with all the elements listed in Appendix E of the specification.

(b) Very few candidates failed to gain this mark. Most incorrect responses were for magnesium.

(c) Only a minority of candidates gained full marks on this question. Most candidates failed to put reduction in the final sentence, with the most common incorrect response being oxidation.

Question 2 (Low demand)

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

(b) Surprisingly few candidates gained full marks for this question. The most commonly correct response was for the second question (carbon dioxide). A significant number of candidates gained two marks with either billion and carbon dioxide or carbon dioxide and water.

(c) A significant number of candidates gained two marks for this question but few gained full marks. Most commonly, two marks were gained in the first two sentences. Many candidates did not even attempt the final sentence and those that did often incorrectly responded by writing respiration or global warming.

(d) Although many candidates have a clear understanding of what causes earthquakes, few understand how we detect earthquakes. Schools / colleges need to ensure that their students have studied information given in the Additional Guidance. The most common misconception is that minor tremors and tectonic plate movements come before the main earthquake rather than as 'after shocks' following the main earthquake. Most common correct answers related to being able to see the tsunami wave out at sea or to the tide retreating. However, quite a few candidates incorrectly referred to changes in the weather as indicators of either earthquakes or tsunamis.

Question 3 (Low demand)

(a) (i) Disappointingly few candidates named the element correctly. Candidates are expected to be familiar with the symbols of the first 20 elements of the periodic table, as indicated in Appendix E of the specification. The most common incorrect responses were nitrogen and neutrons.

(a) (ii) Candidates found this question difficult and the most common incorrect answer was 11. A significant number of candidates circled more than one response, negating the mark.

(a) (iii) Just over half the candidates gave the correct response.

(b) It is clear that schools / colleges are attempting to teach candidates about the information given in the periodic table but candidates often responded to this question by stating it is 'the largest number', rather than giving the meaning of mass number. It is important that candidates are taught how define such key terms.

(c) (i) 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.

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

Question 4 ((a) Low demand / (b) Standard demand)

(a) (i) Surprisingly few candidates gained full marks here, many giving an order that clearly would not be achievable, such as putting woodlice into the chamber before collecting them.

(a) (ii) Even though half of the candidates gained a mark for the question, many were putting the answer as a decimal even though the mean refers to living organisms. Candidates were awarded the mark in this instance but should be encouraged to think about mean calculations and should understand that when dealing with organisms answers should be given as whole numbers.

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

(b) Few candidates at Foundation tier gave a Level 3 response, most achieving Level 2 or Level 1. Most commonly correct responses referred to fur colour, camouflage and hiding from prey or predators. Some candidates referred to 'thick fur keeping the arctic fox warm' but few mentioned the scientific term insulation. Many candidates incorrectly referred to the large ears on desert fox giving better hearing and so missed the link with heat loss. Some candidates gave vague responses such as 'it has thick fur' and not being specific about fox and feature. Some candidates just repeated the data from the images but did not suggest what the differences meant about their adaptations. Some candidates were incorrectly writing about 'white fur keeping them warm', rather than either 'thick fur keeping them warm' or 'white fur for camouflage'. Some candidates incorrectly referred to the size of fox, for example 'the desert fox being smaller so it can hide in holes'. At this level few candidates managed to correctly discuss surface area to volume ratio. For example, some candidates wrote that the 'arctic fox has **larger** surface area to **absorb more heat**'. Some candidates also referred to adaptations not given in the pictures and then found it difficult to write a good answer, for example 'arctic foxes eat fish and desert foxes eat spiders'. Although these may be true they are not describing how this helps the fox survive in that particular environment.

Question 5 (Low demand)

(a) Very few candidates gained full marks here, with most gaining one mark for drawing the plant growing horizontally at first. Teachers need to be aware that phototropism is not the only response that is indicated on the specification and that gravitropism also needs to be taught.

(b) Few candidates gained any marks on this question. Although a few understood that auxins have a role in plant growth responses they obviously did not understand the mechanisms involved. Often candidates wrote about auxins 'moving away from the light' or 'moving to the shaded side' but did not realise that the plants were in the dark so that the movement is due to gravity alone. It was clear that most candidates had been taught about auxin and plant growth only as a response to light and not gravity, although both are covered in the specification. Many candidates referred to the plants dying due to lack of photosynthesis and nutrients even though the experiment was only over two days, which is not long enough for this to have an effect.

(c) Very few candidates gained the mark for this question. Most gave phototropism or described rather than named the response, for example, 'it's a response to gravity'. Quite a few candidates referred incorrectly to photosynthesis or respiration.

(d) Almost no-one gave the correct response here: most candidates were writing vague statements such as 'to see if it grew in the dark', 'to see if it would survive in the dark', 'to compare light and dark', 'to see what conditions effect it' or 'to see if it grows the same'.

Question 6 (Standard demand)

(a) (i) Very few candidates failed to gain this mark. Most incorrect responses were 'photosynthesis' or candidates repeating information from the diagram – for example, 'carbon in plants'. It was clear that many candidates do not understand the term 'process' when used in a scientific context.

(a) (ii) Again, very few candidates failed to gain this mark. Most incorrect responses were of 'respiration' or 'decomposition' following on from incorrectly photosynthesis in part (i). Quite a few candidates wrote mining or pollution, or simply repeated information from the diagram, for example, 'carbon in fuels'.

(a) (iii) More candidates gave the correct response here than for parts (i) and (ii). However, many again simply repeated information from the diagram, for example 'organic remains in the soil'. Some gave vague answers such as 'insects'.

(b) It was disappointing to see that few candidates managed to gain more than one mark for this question with the most common correct response being either damp or moist. If candidates gained two marks these were usually for writing damp and warm with quite a few incorrectly referring to 'dark'. Some candidates gave vague answers such as conditions needing to be 'fresh' but it was not clear what they meant by this – fresh air or fresh not rotting? Other incorrect responses referred to compost heaps needing to be 'compact'.

(c) Few candidates gained any marks on this question and many clearly struggled to evaluate the data shown on the graph. Many candidates tried to give responses in terms of the causes of elevated carbon dioxide; for example, 'the graph doesn't show other causes of global warming'. Most responses were very vague and often unrelated to the data shown on the graph. The few correct responses seen related to either identifying that the time scale is too short or that the data was from only one location. Disappointingly, very few realised that the graph only showed carbon dioxide and not temperature changes.

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

(a) Candidate responses to this question showed an even number of responses with one, two, three or four marks. Incorrect responses included stating 'north star' as the nearest star to Earth, that our solar system contained 'stars' and that the nearest natural object to Earth is 'Mars'.

(b) Very few candidates gained any marks on this question. Most candidates had very little idea about the Doppler effect and those that had clearly been taught it only referred to Doppler effect on sound and could not link it to light. Many candidates wrote incorrectly about pitch getting either quieter or louder when object moves away or towards the observer. Quite a few candidates wrote about red and blue shift with no clear idea understanding of the concepts they were trying to discuss. There were also many vague references to waves 'changing' as the object moves away from the observer but not stating how they change.

(c) This question was answered better than part (b) with most correct answers referring to red-shift of the spectrum line or the black lines moving nearer the red end. Few candidates could link this, however, to the stars moving further away from Earth and instead wrote vague answers. Some candidates incorrectly referred to 'the light becoming red' or 'the star becoming red'.

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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