



**General Certificate of Education (A-level)
June 2012**

Science in Society

SCIS1

(Specification 2400)

Unit 1: Exploring key scientific issues

Report on the Examination

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General Comments

The paper this year was accessible to candidates with a good range of marks achieved. The majority of candidates were able to tackle most questions, and there was little evidence that they ran out of time.

Many candidates were able to identify HSW ideas, and candidates who gained higher grades were able to support the points they made with examples or explanation. Some candidates answered questions related to specification section 3.5.1A with vague statements such as 'increases reliability' when a more detailed explanation is required. Candidates should be encouraged to explain themselves clearly in an answer, rather than resort to single word generalisations.

On a related note, this year, as most years, a small number of candidates felt compelled to correct the questions on their answer paper. This occurs for questions where the stem begins "Do the data....?". Inevitably, a few candidates 'corrected' this to "Does the data....?", not realising that data is technically plural, and thus the stem is phrased appropriately.

Question 1

This question was generally well answered, with many candidates confidently handling the data in both the pie chart and the table.

In part 1(a)(ii) candidates who scored full marks identified both a suitable prevention method for their chosen disease, and also how the spread of the disease-causing microbe was stopped by that method.

Many candidates were able to use the data given in the question to support their discussion about the likelihood of meeting the millennium development goal in 1(c)(ii), with suitable simple calculations carried out to compare the rate of decrease already achieved with that which is required to meet the goal.

Question 2

The suggested link between air quality and appendicitis was an unusual context for transport issues. However, candidates were able to tackle most of the key HSW ideas which were raised by the question.

In 2(c)(i) there was a large number of potential conclusions about air quality and appendicitis that could be identified from the rich data in the question. Candidates who scored highly on this section were able to identify suitable conclusions linked to specific data. A number of candidates tried to provide more generalised conclusions but these did not allow them to access the full range of marks for the question. A typical example of this type was 'Overall, ozone was more dangerous than sulfur dioxide', which did not gain a mark, whereas a statement such as 'the risk of appendicitis decreased with age when there was an increase in ozone 5 days before the attack' was considered creditworthy.

Many candidates were able to identify different ways in which the existence of a correlation between air quality and appendicitis could be strengthened in answer to 2(c)(ii). However, the majority of candidates did not recognise that a specific mechanism which could explain the effect of air quality on the body would be needed to allow a causal link to be made (2(c)(iii)).

Question 3

This question was concerned with an example of ‘human induced evolution’.

In 3(b)(i) a number of candidates rephrased the question in their answer, giving answers such as ‘so researchers knew the concentration of the solution’. However, over half of the candidates were able to give answers which explained why this was an advantage in terms of experiment design.

A similar pattern of response was noted in 3(c)(i) with some candidates responding that the error bars were there to ‘show the error’ in the data, and did not appear to realise that, in this particular graph, the bars show the *range* of data taken from 64 different fish and so are useful to see how wide the range of swimming times is for each area.

Q3(d) asked candidates to suggest how natural selections and human behaviour could have led to a change in the population of the fish over time. Pleasingly, 24% of candidates were able to give a cogent and complete explanation and gain full marks. However, as in previous years, we did see a number of answers in which fish ‘choose’ to evolve in order to survive, missing the random nature of natural selection.

Question 4

The parts of this question relating to the Science Explanation (specification section 3.6.1C) were generally answered very well. In 4(b)(ii) two-thirds of candidates were able to correctly calculate the likelihood of a child having cystic fibrosis, and explain their answer using a punnet square.

In 4(c) a number of candidates did not read the question correctly and gave answers which suggested that the testing being discussed was embryo testing (such as amniocentesis). However, the testing referred to was that of prospective parents, before conception had taken place. Candidates who did not realise this were unable to gain marks for this question part.

Question 5

This question was set in the context of the placebo effect in medical practice. Many candidates recognised that the use of a double blind trial would be used to minimise the effect of the placebo effect on the results of a clinical trial. However, fewer candidates described how the results from the placebo and treatment arms of the trial would need to be compared to identify, and account for, any potential placebo effect.

Some candidates misread the x-axis of the graph in Figure 8 and in 5(b)(i) answered in terms of days, not hours. In this case, candidates were not penalised for this misreading, as long as their answer was otherwise appropriate. A number of candidates gave answers which included an explanation of the shape of the graph, rather than using the data to compare the different parts of the graph.

In 5(c)(i) and 5(d) a surprising number of candidates suggested that doctors would make use of a placebo treatment instead of suitable ‘real’ treatment possibly as a way of saving money. This answer was not credited. Similarly, when candidates suggested that the placebo treatment would be used first, rather than as a last resort in 5(d) they were often unable to access the higher mark bands with their answers.

Question 6

This question was generally answered well. The exception to this was the Science Explanations required in 6(a)(iii). Very few candidates were able to give an answer which addressed the significance of both the type of radiation and the activity of the source. A number of candidates also confused ionising radiation and electromagnetic radiation, discussing the wavelength of the waves in their answer and not referring to the ionising nature of alpha, beta and gamma.

Question 7

This was one of the harder questions on the paper, testing as it did, Science Explanations (specification section 3.6.1D). As in previous years, candidates find radioactive decay and half-life difficult, and struggle to answer questions which make use of these ideas. In 7(c)(iii) many candidates were able to identify the correct half-life to use, but more than half of the candidates did not know what to do with the value they had chosen.

In 7(c)(iv) a small number of candidates appear to have misread the question and thought that the time referred to was the actual time it took them to work out the answer in 7(c)(iii), rather than the time require to reduce the amount of U-238 in the meteorite by $\frac{1}{4}$.

7(d) was an example of a question where candidates gave vague answers such as 'more accurate' and 'more reliable' without explaining their answer. To obtain credit, candidates needed to explain why having two answers could be more reliable. Candidates should also realise that having two values for the age of the meteorite would not allow anomalies in the data to be spotted.

Question 8

As usual, the final question on the paper is based on a comprehension passage related to one of the contexts in the specification. This year the context appeared to be accessible to all candidates, and many were able to use the passage suitably in the answers to the question parts. For example, in 8(c)(ii) many candidates were able to make a good attempt at describing the essential characteristics of a prospective study using the information in the passage.

The level marked-question part allowed almost all candidates to gain at least 1 or 2 marks in their answer by identifying suitable data from the passage and presenting it to support their viewpoint. However, candidates should be encouraged to write in their own words, rather than quote extensively from the passage. Candidates who scored in the top mark band were able to include ideas about risk (including that there was little evidence of harm in eating 5-a-day) as well as support their argument with additional information about lifestyle and diseases.

Mark Ranges and Award of Grades

Grade boundaries and cumulative percentage grades are available on the [Results Statistics](#) page of the AQA Website.