



**General Certificate of Secondary Education
June 2011**

Environmental Science 44401F

(Specification 4440)

**Unit 1: Topics in Environmental Science
(Foundation)**

Report on the Examination

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General

As this is the first time this specification has been examined it was pleasing to see a good spread of responses by candidates demonstrating good subject knowledge. Candidates scored well on those core topics that have been examined for some time, but many struggled with some of the newer topics such as biofuels.

There were no candidates on the Foundation tier that were entered for the wrong tier.

Question 1

Candidates demonstrated a good understanding of the enhanced greenhouse effect and its consequences. Weaker candidates tended to give answers that were too general such as pollution as an answer to parts 1(a) and 1(c). Better candidates gave a range of suitable consequences of an increased greenhouse effect.

Question 2

Several candidates seemed not to understand the term ‘property of a rock’ with a very large number of candidates giving an example of a rock type as a answer to 2(a)(i). The majority of candidates identified sandstone as a suitable aquifer rock in 2(a)(ii).

It was disappointing how poorly a significant number of candidates answered the parts of this question based around practical investigation. Given this style of question is used in the controlled assessment it was expected that candidates would find it familiar.

A significant number of candidates found even the simple calculation question challenging and centres would be advised to give candidates more practice at this type of question.

A common error on 2(c)(i) was that greater pollution resulted in more biotic indicator species. 2(c)(iii) was the part of this question that candidates answered most successfully with approximately half the candidates correctly identifying eutrophication as a consequence of nutrient pollution.

Question 3

Candidates were generally more confident with this question, scoring well on the data response questions. Most candidates gave global warming as a reason for increasing water demand but several also identified increasing population/demand for food and increasing standards of living.

3(c)(ii) produced a good range of sensible responses. Weaker candidates tended to give impractical responses such as water companies restricting supply or homes drinking less water.

Question 4

Of all the questions on the Foundation paper this was the one with which candidates seemed most secure, with the smallest number scoring no marks. Unfortunately, in part 4(c), which was in the new style of extended question, although generally candidates scored well, very few achieved the maximum 4 marks available because this required clear structuring of candidates answers with concise use of scientific terminology and good spelling, punctuation and grammar.

Question 5

Candidates had a good understanding of intensive and extensive agriculture. 5(a) was particularly well answered. Least well answered was part 5(c) which required candidates to explain the link between increased mechanisation and soil erosion, with 75% of candidates unable to make a valid suggestion.

Question 6

A surprising number of candidates were unaware of the Sun's position in the sky throughout the day. Of all the calculation questions on the paper 6(b) was the one most candidates correctly answered.

In question 6(c) several candidates lost marks by giving answers that related to changes in infrastructure such as putting in solar panels, rather than behavioural changes such as switching off lights when leaving the classroom. 6(d)(i) was well answered but 6(d)(ii) caused greater difficulty for candidates.

Question 7

This was another question that candidates answered well. The main issue was candidates giving answers which were too general such as 'causes pollution' in part 7(a) rather than giving a specific example of a type of pollution caused by landfill.

Question 8

Candidates found this question more challenging. The majority of candidates achieved well on part 8(a) but several candidates lost marks on part 8(b) by not giving units. Candidates should be made aware that if units are not given in the answer box then they should always state them.

Ecological Footprint is a concept that many candidates did not understand.

Question 9

Many candidates were unaware of the need for large volumes of water for cooling nuclear power stations, or that nuclear power stations do not produce significant amounts of carbon dioxide. Given recent events in Japan it was also surprising that so many students could not think of a reason why environmentalists might oppose the building of more nuclear power stations.

Most candidates were able to name the materials used in the nuclear power stations but fewer were able to describe their functions.

Question 10 (common with Question 1 Higher Tier)

Several candidates identified food miles as relating to trade between different countries but then failed to relate it to the distance the food has to travel, concentrating on fuel consumed or carbon dioxide produced. In part 10(b) a common error was to discuss the energy used in food production rather than in transporting. Candidates listing resources rather than describing the resources gained no credit.

Candidates were able to make good use of the stimulus material in part 10(c)(i) to suggest how 'Planet Thanet' uses natural resources. In part 10(c)(ii) a lot of candidates thought that increasing heat caused greater photosynthesis. Better candidates were able to discuss the concept of optimum temperatures and rate limiting factors in photosynthesis. Foundation tier candidates often confused respiration and photosynthesis.

In part 10(d) most candidates understood the need for additional energy in the form of heat to grow tropical plants in the UK but a few went down the route of the need to transport crops or fertiliser application. In part 10(e) most candidates were able to make at least one sensible suggestion. Common misconceptions related to global warming and the cost of transporting crops to MEDCs.

Question 11 (common with Question 2 Higher Tier)

Although much of the required information could be gleaned from the stimulus material, many Foundation tier candidates found this question challenging. It was pleasing to see candidates giving full answers rather than giving one word responses.

Candidates found part 11(c) the most challenging. Any suitably described survey technique was acceptable but just saying carry out a survey was not. Part 11(d) produced better answers but Foundation tier candidates found parts 11(e) and 11(f) particularly challenging.

Question 12 (common with Question 3 Higher Tier)

The concept of biofuels was poorly understood by both Higher and Foundation tier candidates. Better candidates understood that all biofuels rely on photosynthesis either directly or indirectly.

Many weaker candidates thought that cattle might be a good source of methane as a fuel, and while cows produce a lot of methane, we are unaware of a method to successfully harness this!

Many candidates thought carbon neutral meant that the fuels did not produce carbon dioxide. In part 12(d) candidates frequently ignored the word 'growing' in the question and talked about pollution caused by fuel conversion/transport.

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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