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**General Certificate of Secondary Education**
**June 2012**

# Environmental Science 44401H

# (Specification 4440)

# Unit 1: Topics in Environmental Science (Higher)

# *Report on the Examination*

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## General

Students seemed much better prepared for the demands of this paper compared with last year. There were no noticeable gaps in subject coverage and the range of answers demonstrated an excellent depth of knowledge across the specification.

If schools and colleges could work with students to clarify the differences between *explain*, *describe* and *suggest* in question stems, it would be highly beneficial to students.

## Question 1 (common with Question 8 Foundation Tier)

**(a)** A few students lost marks by saying the level of fishing impacted on sustainability without saying in what direction. Many *described* without *explaining*.

**(b)** Generally well answered with using wild fish to feed farmed stocks being the most popular answer. There was some confusion between fish farming and factory fishing.

**(c)** Several students thought that quotas were for total fish caught rather than being species specific. Net size was well answered. Only better students identified that restricted areas gave fish there a chance to breed to help repopulate the areas around. Line fishing – many students correctly suggested the elimination of by-catch as the most important advantage.

**(d)** Well answered.

## Question 2 (common with Question 9 Foundation Tier)

**(a) (i)** Some students only gained half the available marks because they *described* but did not attempt to *explain* or described more than two changes.

**(a) (ii)** Several students failed to read the question and explained the changes in demand rather than saying how the energy resources we have available in the UK can be used to meet these fluctuations. A significant number of students suggested solar and wind energy could be stored until needed.

**(b) (i)** Well answered.

**(b) (ii)** Some students gave the same but converse answer so did not get the two marks available eg countries with a high GDP have more money to spend on energy, countries with low GDP have less money to spend on energy. Other students described the data on the graph rather trying to suggest reasons for the relationship.

## Question 3 (common with Question 10 Foundation Tier)

**(a)** This question discriminated well, with students scoring marks across the mark range. The majority of students at this tier gained three marks or more. Least well covered overall were the advantages / disadvantages of rivers as sources of drinking water.

**(b)&(c)** Very well answered.

**(d)** Some confusion about the term permeable ie 'reservoirs should be built on permeable rock', otherwise well answered.

**(e) (i)** Some students failed to identify particular users or identified the users without suggesting the source of conflict between them.

**(e) (ii)** Most students identified space and time zoning for both marks.

**(f)** Some confusion between 'grey water' and collected rain water or untreated water.

**(g)** Most students obtained at least two marks.

**Question 4**

**(a) (i)** The main error here was that students concentrated on the high death rates rather than the small population having a lower growth potential.

**(a) (ii)** Most students correctly calculated the increase to be 4 billion.

**(a) (iii)** A good range of answers, although a few students lost marks by using imprecise language such as shortage of energy or resources rather than non-renewable energy or resources which is needed at this level.

**(b)** Well answered apart from those students who confused developed and developing.

**(c) (i)** Students should be advised not to use the words they are trying to define in their definitions.

**(c) (ii)** Most students gained at least one mark natural disasters, wars or famine being the most popular answer.

**Question 5**

**(a)** Very well answered.

**(b)** Many of the answers given were 'we used more coal' without any suggestion as to why this might be.

**(c)** A lot of confusion suggesting greenhouse gases damage the ozone layer. Many answers described the greenhouse effect in detail, but unfortunately a range of problems were needed for full marks.

**(d)** Energy density was the most popular answer.

**Question 6**

**(a)** Several students ignored the instruction "*apart from an increase in average temperature*" or wrote about the consequences of global warming.

**(b)** Many students concentrated on the loss of cold weather crops. Better students suggested the growing of existing crops moved northwards and that we could grow Mediterranean crops in the south.

**(c)** Students frequently thought carbon taxes were directed at individuals which was not accepted unless it was linked to vehicle taxes. Another common misconception was that carbon capture enabled the reuse of the carbon dioxide in some way.

**(d)** Some very good answers with students being able to quote which countries did not sign up to the treaty.

**(e)** A lot of confusion regarding damage to the ozone layer being linked to climate change.

**Question 7**

**(a)** Some really excellent, well thought through answers. The range of science used to explain oxygen depletion was particularly impressive, ranging from bacterial respiration and loss of photosynthetic capacity to reduced surface diffusion.

**(b)** A challenging question which gave better students the opportunity to demonstrate their knowledge and understanding.

**Question 8**

**(a)** Several students lost marks by not making clear what countries they were referring to.

**(b)** A good range of excellent suggestions. Some students mistakenly gave examples which would not increase output, such as greater uniformity or enhanced nutritional content.

**(c)** Not as well answered as expected for what is a quite straight forward question. Some answers were not "environmental" particularly for housing animals indoors where ethical answers were common.

**(d)** Many students did not attempt this question. Better students covered the uses of subsidies and or guaranteed pricing for crops.

**Question 9**

**(a)** The majority of students understood what CITES was, but failed to get the second mark by not suggesting how this helped protect the rhino by making it less profitable to poach.

**(b) (i)** A good range of answers covering the full range of possible answers, captive breeding and reintroduction being the most popular suggestions.

**(b) (ii)** The majority of students gained only one mark. Tame behaviour and lack of hunting skills were the most popular answers.

**(b) (iii)** This question discriminated well and there were some very good answers.

**(b) (iv)** No issues, although a few students thought this listed endangered animals in zoos.

**Question 10**

**(a) (i)** A challenging question which produced answers of varying quality for a wide range of habitats. Several students used last year's question about using cattle grazing to improve the habitat for choughs, to answer this very different question to good effect.

**(a) (ii)** As might be expected, if the student did not understand the previous question they could not answer this follow up question. However students who only managed one mark in part (a) frequently achieved both available marks here.

**(b)** Not well answered. It seems many students have not had the opportunity to carry out fieldwork which would have helped them answer this question. Many students thought quadrats were used for small areas and transects for large areas.

**(c)** Many students gained the first mark for describing a method to measure pH but then did not explain how to improve the reliability of their technique, eg if using an electronic probe it should be calibrated before use.

**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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