



**General Certificate of Secondary Education
June 2011**

Environmental Science 44402

(Specification 4440)

Unit 2: Investigations in Environmental Science

Report on the Examination

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This year was the first examination of Investigative Skills Assignments (ISAs) in AQA GCSE Environmental Science.

Teacher Standardisation meetings were held last Autumn to help explain the new procedures and give the teachers some experience of marking ISAs.

Due to the change from a centre-based investigation to the controlled assessment, the work produced by candidates was of a different nature to that seen in previous years. It was difficult at times to interpret some of the selective comments made in answers which referred to their own centre-based work. The moderators were satisfied, however, that the marking guidelines allowed teachers to reflect the ability of their candidates through the published mark scheme. There was little deviation from the suggested answers to questions although there were specific misunderstandings in some answers that are mentioned below.

Teachers responded well, overall, to the changes in the specification and to the new format of the ISA examination. The teachers who fared best appeared to be those who shared their new challenge with colleagues in the science departments in their centres, who had been using ISAs for several years.

Administration of the ISA examination

Many centres had some difficulty with administering the examination. A high proportion of centres submitted work well after the published deadline. Some centres with 20 candidates or less did not send their mark sheets and scripts to the moderator by 7 May. Some centres when asked about 'non receipt' of work claimed that they were working to a different deadline - 15 May. Teachers are advised to work closely with their Examinations Officers to ensure that the regulations are understood; this is particularly important where 'new' or 'inexperienced' staff are in charge of the marking.

Several centres were tardy in dealing with requests for sample scripts; with a few taking more than two weeks to respond. About a quarter of centres did not send a fully completed Centre Declaration Sheet and a high proportion failed to send or sign Candidate Record Forms. This paperwork was the same as in previous years and it was difficult to understand how best to assist teachers in their administrative work in future years.

Once received, the ISA papers were generally in good order. Apart from a few centres, where the presentation was untidy and the work of some candidates difficult to read, the scripts were generally well produced and based on some good centre-based investigations. As in previous years some centres submitted unbound work (and sometimes with lack of page numbers and out of order) which made the physical processing of the work slower. Some teachers failed to write their marks on the scripts, or wrote insufficient annotations to assist the moderators in finding evidence to award marks. Several errors in addition of marks and the omission of Practical Skills Assessment (PSA) marks from the main mark sheet also slowed down the moderation process.

Teachers are requested to familiarise themselves with the necessary administrative procedures before the start of the 2012 examinations. There is sufficient time, after receiving the teacher notes, for teachers with queries to contact either AQA or the Principal Moderator to request and receive advice.

General comment on both Fieldwork and Laboratory ISAs

- In general the graph and table construction was untidy. This made it difficult to verify the accuracy of the work. Many graph axes and tables were unlabelled.
- In the questions 7/8 'Table, Graph' most centres failed to indicate their mark in the ISA paper. It is important that markers demonstrate how they have awarded each of the 6 marks to justify the mark awarded.
- Some centres awarded marks for titles and 'neatness', when there were none given in the mark scheme and some teachers awarded 5 marks (out of 4 max) for a graph.
- In many cases candidates crossed out part of their scripts without replacing with a new statement. Sometimes the original negated statement was correct. It is thus important that candidates are fully briefed on examination techniques and be advised not to rule out what they have written without an alternative put in place.
- Several candidates referred to variables and data which were not in the graphs and tables submitted. It was, thus, impossible to verify their accuracy.
- Many basic terms need to be learnt thoroughly by candidates. For example, the words 'accuracy' and 'reliability' are not interchangeable. Candidates are advised to make full use of all resources provided.
- There was a lack of quantification in answers which required evidence for showing links between variables.
- When requested to use evidence from their own work in an answer, some candidates were reluctant to do so and thus lost marks.
- Moderators would welcome more information from centres on the work done by candidates in their investigations. Some centres did this and it was a great help in interpreting work and giving best marks available.
- Most investigations done by centres were straightforward and well organised. Most candidates appeared to have understood the work they had done. This made it easier for them to tackle Part 2 of each paper successfully.

ISA 1 Fieldwork Investigation

Question 1

The independent and dependent variables must be the same as those shown on the candidates' graphs, unless there is a valid explanation. Only one independent and dependent variable should be discussed in ISAs, even if several were measured on the day. For example, only water pH and insect numbers, not all of pH, oxygen levels, temperature, insect numbers and biotic index - as in some papers.

Question 3

Many candidates failed to expand their answers to gain a mark: eg it was not enough to say, simply, 'get an average' or 'to make it a fair test'.

Question 4

In 4(c), it was not enough to just say ‘weather’ –an identified element of weather is required.

Question 5

The answer should have identified anomalies by their distance from the best fit line if there was a ‘yes’ answer. A number of candidates failed to note any simple pattern.

Question 6

In 6(b) most candidates did not achieve the second mark because they failed to quote numerical evidence. The full explanation and mark relies on that evidence.

Question 10

Few candidates made the point that factors affecting the spatial distribution of pollution were not evenly distributed across all bands. Thus comparisons between bands was difficult.

Question 11

The mean calculation was generally well carried out, but most candidates did not give the correct answer. An answer to one decimal place was expected but many gave 17.6 which was wrong. 17.6 recurring was satisfactory and 17.7 was expected.

Question 12

Most candidates answered parts 12(a) and 12(b) correctly.

Question 13

Usually single word answers failed to gain a mark.

Question 14

Most candidates showed good practical application for the data obtained.

Question 15

In 15(b) many candidates referred to gravestones again when they had been told that this was a different survey across the whole area. The quality of language used was highly variable, but mainly poor, in this question which rewarded good English and use of specialist terms. It is recommended that teachers give guidance on how to organise information clearly within a few lines.

Specific comments – ISA 2 Laboratory Investigation

Question 1

Several teachers did not allow a mark for what appeared to be valid risk factors. Generally a one word answer was not allowed.

Question 3

Again one word answers were not accepted. 'Insulation' was not enough but 'thickness of insulation' was acceptable.

Question 4

To gain full marks it was necessary to quote numerical evidence. Many students did not do this and lost easy marks.

Question 7

This question was generally well answered.

Question 9

Very few candidates gave a correct answer. A definition of 'random' was required. Many candidates repeated the question as their answer.

Question 10

A wide range of possible control variables were allowed. Few candidates managed to suggest more than one and many repeated either the previously stated dependent or independent variable in their answer. As in the previous ISA the quality of presentation of English was poor in many cases and very few candidates gained full marks.

Question 11

In 11(c)(ii) few candidates mentioned specific properties of the insulating material which made it a good insulator.

Question 14

In 14(b) almost all candidates identified the need for additional energy to process the Minwoolins which made it less environmentally-friendly.

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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