

Science (Science Plus)

Entry Level Certificate R482

Examiner's Report

June 2011

R482/R/11

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This report on the Examination provides information on the performance of candidates which it is hoped will be useful to teachers in their preparation of candidates for future examinations. It is intended to be constructive and informative and to promote better understanding of the specification content, of the operation of the scheme of assessment and of the application of assessment criteria.

Reports should be read in conjunction with the published question papers and mark schemes for the Examination.

OCR will not enter into any discussion or correspondence in connection with this report.

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Introduction

An Interim Feedback Form (IFF) is sent to centres which have submitted a sample of work for moderation by the deadline of 9 March. Centres can, where necessary, act on the interim feedback provided by their moderator to ensure that they submit the correct final marks for their candidates by the deadline of 15 May. If a centre does not submit a sample of work to their moderator in March then there may not be time for the moderator to provide helpful feedback.

A 2012 moderation sample from a centre requires:

- 1 A Centre Authentication Form (CCS160)
- 2 A headed piece of paper with the name of the teacher responsible, and preferably including an email address as well as a telephone number and centre address
- 3 A letter stating how standardisation was carried out in the centre
- 4 The work of six candidates from the centre.

For each candidate there should be:

- A **photocopy** of the Candidate Record Card (CRC) which has been completed to show how the final points total has been achieved*
- ALL marked end-of-item tests
- The study of a science topic preferably with a cover sheet
- The data analysis task preferably with a cover sheet.

*Please remember that the final points total should be rounded down.

After the moderation, if the work has been submitted to deadline, centres will be sent back:

- 1 The study of a science topic
- 2 The data analysis task
- 3 An Interim Feedback Form (IFF).

If the centre submits work too late to receive an Interim Feedback Form or submits photocopies of all the work then work is not returned to the centre.

When the results are despatched in August centres will also receive:

- 1 A copy of the moderator's report
- 2 Any adjustments made to the points totals.

The Entry Level Science course has continued to be very successful and it is popular with both teachers and students. Training events have taken place around the country and provide useful support for teachers.

The possibility of using the study of a science topic in Gateway Science or in Twenty First Century Science has led to many centres double-entering candidates for Entry Level Science and GCSE Science. Please note, however, that the Gateway Science writing frameworks do not cover the same criteria as Entry Level Science and using these without adaptation could place extra demands on candidates, reducing their ability to score well.

The introduction of a new Entry Level Science specification this year means that there will be a number of 'Get started' training courses. Dates for these free events are supplied below.

**OCR Entry Level Certificate Science (R591):
Get started – successful first delivery (2011)**

Date	Venue
Thursday 29 September	London
Friday 7 October	Leeds
Wednesday 2 November	Bristol
Wednesday 9 November	Newcastle
Monday 14 November	Manchester
Friday 25 November	Birmingham
Wednesday 14 December	London

The popularity of the course is indicated by the entry numbers: this year 4468 candidates were entered from 384 centres.

Internal moderation procedure

Internal moderation should take place in centres before submission of the sample to the moderator. A piece of headed notepaper should contain information to say how this internal moderation has occurred, even if it states that there is only one teacher and the marks are checked by the Head of Department. It is helpful if a contact email address for the teacher responsible for Entry Level Science is also provided.

Administration

This year there were only a few centres that forgot to submit their Centre Authentication Form (CCS160). This form must accompany any coursework from a centre to a moderator.

Moderators continued to send out letters to centres early in the moderation process pointing out where administration, particularly arithmetic, was not correct (form L3). Sometimes these administrative errors were from centres in which the marking of end-of-item tests, studies of a science topic and data analysis tasks was otherwise exemplary.

Part of internal moderation within a centre should be checking that marks have been correctly added and transferred. Centres should use the Candidate Record Cards as working documents throughout the course. Filling these in at the last minute can lead to errors.

Many of these errors and omissions remain similar to those noted over previous years:

- Delayed submission of the work, even after being contacted by the moderator.
- Not enclosing a covering letter with the sample giving the name of the contact teacher or not saying in the covering letter how internal standardisation was carried out (if the course is taught by one teacher than the letter should simply say this).
- Not putting candidate names on tests or assessed work which causes serious problems over identification of work.
- Submitting end-of-item tests for moderation that had not been entered on a Candidate's Record Card, or had not been marked.
- Incorrect totalling of points for end-of-item tests on page four of the Candidate Record Card.

- Rounding-up the final total of end-of-item test marks and/or final total of can-do tasks to whole numbers rather than to one decimal place.
- Not submitting the study of science topics and data analysis tasks for the chosen candidates.
- Not rounding-down the final mark.
- Sending the moderator a copy of the MS1 in May. It is not necessary to send this to the moderator; the MS1 should only go to OCR.
- Counting more than 30 end-of-item tests. Candidates can take more than the 30 tests, up to the maximum of 39, but only the best 30 are counted.
- Not counting the best eight can-do tasks (or counting more than eight).
- Not posing the study of a science topic as a question. It is difficult to award marks under Aspect C if the study of a science topic task has not been posed as a question.
- Sending the original Candidate Record Cards rather than photocopies. Photocopies should be sent because centres need to refer to the original record cards when the Interim Report Forms come back since there may be errors on the record cards.

End-of-Item Tests

The 'colour' of end-of-item tests that candidates take depends on the year in which they start the course; they should not use a mix of colours.

Moderators take and remark a sample of six candidates' end-of-item tests, selected from the whole range of tests attempted by the centre, so that a balanced overview of the centre's marking is obtained.

Most centres had marked the end-of-item tests closely following the published mark scheme and had marked in accordance with the instructions on the front cover of the schemes. Centres are to be thanked for the care that they put into this part of the assessment.

Errors that did occur with the assessment of end-of-item tests included:

- Marking the tests in colours other than red (especially green, which the moderator uses)
- Marking 'list' type questions incorrectly
- Circling totals at the end of each question (use the one-tick-one-mark method)
- Incorrect transfer of points to Candidate Record Cards
- Failing to record the end-of-item tests on the Candidate Record Card
- Recording a mark for an end-of-item test not sent as part of the portfolio.

Sometimes teachers may consider that an answer a candidate has given is correct but is not covered by the mark scheme. It is acceptable to mark such an answer as correct, but there should be annotation on the script to explain why the mark has been given (even if only BOD – benefit of doubt).

Can-Do Tasks

Some centres had candidates completing several end-of-item tests and practical activities but ticked very few can-do tasks; despite the fact that the skills assessment work carried out must have involved the candidate demonstrating some can-do tasks successfully.

Only the best eight can-do tasks can be chosen. The maximum is therefore eight 3-point tasks, giving a maximum mark of 24 marks which is then halved to give a total out of 12 points. Low level tasks are useful for training and allowing candidates to show their progress, but opportunities need to be given to allow candidates to perform some of the higher level tasks.

Skills Assessment

In attempting to take the course in one year, some centres did not provide candidates with the opportunity of gaining points for the two skills assessments prior to moderation taking place. Some centres had completed no studies of a science topic, others had not completed a data analysis task and a few had done neither. The moderator needs to see how these have been marked by the centre for the Interim Feedback Report.

Study of a Science Topic

Best practice is to allow candidates a limited free choice of titles, and then allow some research time to see if they can find any information 'for and against' the question posed in the title. Research can be from science books, library books, newspapers or the Internet. Candidates need to be encouraged to find suitable visual material, such as science diagrams, charts or data, along with written information. Once the research part has been done, candidates need to write their report. This can be done using IT (word-processing), producing a PowerPoint presentation, printing out material to make posters or handwriting a report.

Where a student has 'cut and pasted' from Internet sites, teachers should annotate the work to indicate this. It is expected that marking will show where awards have been made, and this is best done using the codes, such as 'C=2' if a conclusion has been reached but without using the data found.

Some suitable titles are:

- Should whale hunting be banned?
- Do supermarkets use too much packaging?
- Should smoking be banned in public places?
- Is junk food linked to obesity?
- Is it okay to diet?
- Is skin cancer linked to sunbathing?
- Is drinking alcohol harmful?
- Should we put endangered animals into zoos?
- Should mobile phones be banned for children under eight?

Or more generally:

- Are cell phones dangerous?
- Is the climate changing?
- Is Pluto a planet?

Candidates are able to get better and easier access to Aspects B and C if the topic is posed in the form of a question. 'Car Safety' as a study of a science topic would be better approached as 'Does speed kill?' and 'Petrol versus Diesel' would also be better posed as a question.

'Paints', 'Sunbathing', 'Kilauea Tsunami' and 'Mobile Phones' are not suitable as they stand but also need to be set as a question so that the mark descriptor 4 for Aspects B and C can be reached if relevant data can be found and utilised.

This year:

- There were more writing frames seen but remember that this often limits the ability to access four marks in Aspect D.
- There were some new titles such as 'Is there life on Mars?' but finding patterns can be difficult if this title is chosen.
- The titles 'Global warming', 'Bottled water' and 'Plastic bags' also appeared a number of times, but a title should always be a question for the candidate to answer. Topics with titles that ask no questions, such as 'Pandas', make it difficult to find science patterns in data, and this makes it difficult to reach a suitable conclusion based on the evidence collected.
- There were some PowerPoint presentations submitted which were interesting but they often strayed from the question posed.
- The commonest study of a science topic was 'Is chocolate good for you?' which may be due to the fact that this topic had been mentioned at training events.
- The most common faults with the study of a science topic were for the candidate to omit the references used in the study and to find insufficient science evidence for and against the question, thus making it difficult to reach a conclusion based on sound evidence.

Data Analysis Task

It is expected that the data analysis task should be a practical exercise rather than a research activity. So, for example, one unusual task submitted by a centre required candidates to carry out computer research to collect melting points and boiling points of alkanes. Candidates then plotted graphs and identified trends such as the 'more carbon atoms then the higher the melting point', but this did not involve any practical activity for the candidate.

Many centres again used the whole class to collect data. When this is the case it would be useful if teachers annotated work so that an individual's contribution can be identified.

Investigating craters and electromagnets proved popular but few surveys were seen. 'Burning candles in different volumes of air' was used as a whole class activity but poor analysis of the results often ensued.

Best practice is to use a class activity where candidates can collect data, share it and then make an individual decision about how much and what to use. This would allow full access to the Aspect A marking criterion of selecting results and plotting charts and the Aspect B criterion of stating a trend.

Tasks which involve both science and using equipment are preferable, so that a trend can be explained using knowledge of science and so that comments can be made on the reliability of the data using experience gained through carrying out the experiment.

Practical activities that have been found suitable for data analysis tasks include:

- The effect of exercise on pulse rate.*
- Which foods contain most energy? Which foods contain most water?
- Investigating the effect of exercise on breathing.*
- The effect of temperature on the flow of gravy.
- The effect of temperature or pH on enzyme activity.
- Investigation into the stretchiness of fibres.
- Investigation into the strength of fibres.
- Investigation into the strength of 'concrete' beams.
- Investigation into the strength of paper bridges.
- The effect of length or thickness of wire on a current.

- Investigation into the size of a current needed to burn out a wire.
- Investigation into how to make an electromagnet stronger.
- Relating stretching force to extension and thickness for elastic bands.
- Investigation into the effects of changing the relative positions of a screen, a puppet and a light source on shadows.
- The effect of speed and 'weight' on the size of craters made by falling objects.
- The effect of using packaging materials of different types to keep a small beaker of water warm.
- Investigation into how effective various materials are at insulating something to keep it cool.
- The effect of friction on stopping distance.

*A simple activity so beware of over-marking.

Sometimes interesting activities are not suitable as data analysis tasks because there are no continuous variables to investigate, so candidates cannot find a trend in the data they collect.

Key Points

- Make sure your candidates are entered for final certification before the 21 February deadline.
- Check that each candidate's work in the moderation sample is accompanied by a Candidate Record Card and that the points have been added together correctly to give a final points total (rounded-down).
- Make sure that the study of a science topic is posed as a question, and encourage candidates to find information 'for and against', so they can reach a conclusion. Include references and visual material.
- Try to investigate a single continuous variable for the data task so that candidates can discover a trend and plot a graph.
- Send in work for moderation in early March, including a study of a science topic and a data analysis task. This means that you can get an Interim Feedback Form and, if necessary, make amendments before submitting marks by the final deadline of 15 May.

R591 and 2013

A revised Entry Level Science specification will be available from September 2011 and the first certification will be in June 2013. In June 2013 candidates can only be entered for R591 certification.

There will be changes to the:

- specification content
- assessment components
- moderation procedures.

The specification content will include 39 items: 13 Biology, 13 Chemistry and 13 Physics items. There will be an end-of-item test for each item. The end-of-item tests are available from OCR's secure website Interchange. They are no longer available to order as hard copies.

The assessment components will comprise:

- end-of-item tests 70 points
- can-do tasks 10 points
- practical task 20 points

Interim certification is possible when students have accumulated sufficient points:

- Bronze certificate 40 points
- Silver certificate 60 points
- Gold certificate 80 points

Final certification is as follows:

- Entry Level 1 40 points
- Entry Level 2 60 points
- Entry Level 3 80 points

R591 End-of-Item Tests

The points from a maximum of 35 tests can be counted. Each test has a maximum of 15 marks and the marks are converted to points. There is a change in the way in which the marks are converted to points for R591 and the new conversion is shown below.

Marks to points conversion for R591

Marks	Points
12 – 15	2
8 – 11	1.5
5 – 7	1
2 – 4	0.5

R591 Can-Do Tasks

The can-do tasks have been arranged as 1 mark, 2 mark and 3 mark tasks and the best 10 count. Therefore the maximum mark is 30 (10 x 3 = 30 marks) and this mark is divided by 3 to give a maximum of 10 points.

No marks are awarded for a task only partially completed.

R591 Practical Task

The practical task is a question that the candidates are given to answer and they will need to:

- plan a procedure to arrive at an answer
- collect and display appropriate data
- process the data and identify trends
- interpret the data and link it to the science
- review the data and the procedure.

The practical task will be teacher-devised with some exemplars provided. Other key features include:

- teacher assessed
- five Aspects of performance to assess
- each Aspect marked from 0 to 4 marks
- a maximum total of 20 marks
- total mark directly converted into points.

There will be a change to moderation procedures in 2013. From 2013 the moderation sample will be requested by OCR once candidate marks have been submitted to OCR in May.

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