Entry Level Certificate
SCIENCE
5960
Report on the Examination

June 2017

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General

Following the assessment and award of ELC Science 5948 the review of the KS4 Programme of study necessitated the introduction of a new specification, 5960.

The subject content for this specification is based on the specification for GCSE Combined Science: Trilogy (8464). Assessments for ELC Science are undertaken at a time chosen to suit the school. There are both single (5961) and a double (5962) awards available.

The subject content is split into six components from each of the subject disciplines:

- biology (components 1 and 2)
- chemistry (components 3 and 4)
- Physics (components 5 and 6)

For each component, the student is assessed by means of an Externally Set Assignment (ESA) and a Teacher Devised Assessment (TDA).

For the double award the work from all six components must be submitted. For the single award work from three components, one across each discipline must be submitted. In the single award, the ESA and the TDA for each subject discipline do not need to be taken from the same component. For example, for biology the ESA could be from component 1 and the TDA from component 2.

For moderation in 2017, three sets of ESAs were available. These ESAs may be downloaded from the Secure Key Materials section of the e-AQA website. They will remain operational for the duration of the specification. Students may attempt all three versions for each component and the one that has resulted in the best mark used for inclusion in the total.

These ESAs must be kept secure and never returned to students. If a school wishes to practise ESAs then they should use the specimen ESAs from the AQA website.

The comments in this report are supplied for the guidance of teachers and schools. The comments should not be taken to imply criticism. The majority of schools operate to a very high standard in terms of their marking of the ESAs and TDAs, and their compliance with the administrative procedures.

Administration

Marks are submitted electronically using E-subs system. This has proved to be beneficial to both schools and moderators and helps to speed up the moderation process. Likewise, the introduction of the electronic form MOD/CEN/ADM/E-SUBS has made it much quicker to inform schools and AQA of any mark changes.

Common themes noted:

- Not going back into E-subs to correct marks. This means that moderators cannot enter their marks and the school may then wrongly go out of tolerance.
- Withdrawing all students and not indicating on E-subs. The school then sits in the 'Awaiting School Marks' section of the system.
- Problems with the E-subs system should decrease.
- Most schools managed to meet the 15 May deadline for submission of marks. However, with E-subs, schools can upload marks and submit the sample to the moderator before this deadline. If they do so, this greatly helps the moderation process.
- Most schools supplied all the correct forms for each student.
- Most students signed the CRF. Failure to do so can result in a delay in the moderation process.
- Some schools were still sending bulky folders containing the complete portfolio of notes, worksheets, etc. These are superfluous to the moderation process! Moderators only require the student's marked ESAs and TDAs which have contributed to the subject total mark.
- For the single award almost all schools correctly submitted evidence from three different complete components. Students who did not complete any of the required components were still submitted for an award – they simply scored zero for any missing component.
- Page 44 of the Specification (Section 4.3) and the CRF outline the requirements for the evidence that needs to be submitted
- If a student is missing a number of pieces of evidence for the double award then an entry for single award could well be advantageous. This can be done free of charge up until a point.
- Schools should ensure that the student's name and number and the school number appear on all the pages of the student's work.
- The ESA and the TDA should be stapled or, preferably, treasury tagged together with the CRF on top and not submitted in A4 plastic wallets.

Marking of the ESAs

The standard of marking of the ESAs was generally excellent this year. The great majority of schools were adhering closely to the published mark scheme. There were very few errors of judgement in evidence.

It is important to follow the procedure below. Failure to do so often led to incorrect totals on the CMF.

- ESAs should be marked in red, using one tick for each mark awarded.
- Subtotals should be put in the right-hand margin at the end of each part of each question.
- Incorrect answers should be marked with a cross.

Hardly any schools made the mistake of using a specimen ESA or one from the previous specification. It is perfectly acceptable to use these for practice but they must not be used for submission for an award.

Marking and annotation of the TDAs

One key change between the legacy specification and the new is that the practical skill areas are now designated:

- A - experimental design
- B - working safely and making measurements and observations
- C - recording data
- D - presenting data
- E - identifying patterns and relationships.

Most teachers annotated work to indicate where and why they had made their judgements of the students' levels in each skill area. This annotation is extremely helpful for the moderators where borderline judgements were made. The simplest way to record marks on the script is to write, for example, 'C2' to indicate that an award of 2 marks has been given in skill area C. If this is written at the point where the student has met the criterion, the moderator can then easily verify whether the mark is appropriate.

When the student has been unable to provide written evidence of their achievements, annotation must be provided to justify the award of marks in a skill area.

Annotation is particularly important with regard to the amount of help that the student has been given. Without such annotation, it is extremely difficult for the moderator to form a judgement.
Although the criteria for marking the TDAs appear hierarchical, it is possible to award marks on a 'best-fit' basis. Therefore, if a student has matched the criteria for Level 1 and for Level 3 but has missed out some of the requirements for Level 2, two marks could be awarded on a 'best-fit' basis.

Choice of suitable investigations

Nearly all schools used an appropriate context for the practical investigation, ie one that was related to the subject content of the specification. The majority of teachers used the suggestions given in the specification or through 'discussion' during an AQA online training session. Schools continue to be encouraged to develop new ideas for TDAs so that they fit in with the school's teaching and learning program.

Moderators felt that students were clearly enjoying their practical work. This was evidenced by the many photographs that were included in some of the portfolios showing students at work.

A number of schools undertook paper chromatography practical. Care must be taken to enable students to present their results as data in order to score in Skill area D.

A number of schools submitted investigations that had formed Required Practicals in the Double Science Trilogy programme as well as TDAs for the ELC. When there is such overlap care needs to be taken that ELC candidates are still able to show their own work, particularly in skill areas A C and D. AQA runs on line and face to face training on these issues as well as more broadly on practical work

Worksheets:

- Many schools produced excellent worksheets for their students.
- Worksheets can be very useful providing that they are generic and not specific to a particular investigation.
- There are many examples of suitable worksheets on the AQA website.
- Where worksheets were not used, students generally scored fewer marks.
- In a few cases the worksheets were over-prescriptive. This limits access to higher marks in some skill areas.
- If a school is unsure of the suitability of a given worksheet or investigation, they should contact their coursework adviser who can provide guidance.

Skill area A: experimental design

Level 1 (1 mark): students should be able to identify the technique or equipment that can be used to investigate the chosen problem. This may be done by using a worksheet which lists or shows diagrams of different items of equipment. The students can then tick or circle the ones which they think appropriate to use.

Level 2 (2 marks): students need to describe the way in which the technique or equipment could be used. This may be achieved by use of a flow chart showing the different steps in the method. Students can then join up the different steps in the correct order to show the method.

The student's method should be capable of producing sensible and meaningful results. Ideally the method should be capable of being carried out by another person.

Level 3 (3 marks): students need to make a simple prediction and justify it so that it is more than a guess. Most students made a good attempt at a prediction. However, teachers are asked to encourage their students to make a prediction rather than a guess.

The best worksheets this year included statements such as:

Prediction: What do you think will happen?
Why do you think this will happen?

Skill area B: working safely and making measurements and observations

Level 1 (1 mark): most worksheets seen by moderators this year included a reference to safety, such as:

Safety: Are there any dangers in this experiment?
What will you do to make sure you are safe?

If a worksheet does not contain something similar to this, an annotation to confirm that the student worked safely should be given.

Level 2 (2 marks): students need to show the ability to make simple measurements or observations. The fact that students have made such measurements or observations may be recorded by a scribe. Schools should remember that there is a full range of access arrangements available for those students who require them. However, schools should remember to include the appropriate JCQ cover sheet.

Level 3 (3 marks): students should explicitly show recognition of the need for the results to be meaningful. Often moderators saw repeated procedures, but without any link to meaningful results. Similarly, lower-attaining students often fail to talk about the reason for a fair test or accurate readings in pursuit of meaningful results.

Skill area C: recording data

Level 1 (1 mark): students simply need to record their results. This does not need to be made in any organised way.

Level 2 (2 marks) and Level 3 (3 marks): students need to record their results in a table.

Most schools this year gave students the opportunity to construct their own table. If done correctly, this would enable the award of three marks. If a teacher deems a student's constructed table is not adequate, a blank table can be provided. This would then limit the award to a maximum of two marks.

Tables should have the correct headings and units. Some teachers were being too generous in awarding three marks to tables that had incorrect headings or missing units. In addition, if results are inaccurately recorded or calculated the student cannot score full marks against skill area C.

Skill area D: presenting data

Level 1 (1 mark): students simply need to select the most appropriate form of graphically showing the results.

Normally this would be:

- a bar graph if the data is categoric (eg different species of plant or different types of metal)
- a line graph if the data is continuous (eg how temperature is changing with time).

In some worksheets multiple choice questions were included. This enabled students to indicate the correct format even if they were unable to produce the actual graph. Some schools were awarding this mark when the student had made the wrong choice.

Level 2 (2 marks) and Level 3 (3 marks): students need to display their results graphically.

Most schools gave students the opportunity to draw their own pie chart, bar graph or line graph. If done correctly this would result in three marks. If a student's attempted graph is not adequate, the teacher may give the student a framework to complete. For example, the teacher could give the student a piece of graph paper with the axes already scaled and labelled. This would then limit the award to a maximum of two marks.

If the student draws a line graph, we would normally expect a smooth trend line or line of best fit. Some schools had not supplied their students with graph paper: some used centimetre squared paper, and some used plain paper. This disadvantages the students as they are unable to show that they can plot data correctly. The best choice of paper is 2 mm^2.

It is important that teachers check that students have plotted the values correctly. And that the student has shown the correct labels and values on each axis. Some schools were awarding level 3 when graphs or bar charts had incorrect or missing labels, scales or units or when the data had been drawn or plotted incorrectly.

For full marks in skill area D the data needs to be plotted correctly, axes need to be linear, labelled and have units.

Skill area E: identifying patterns and relationships

Level 1 (1 mark): students merely need to state their results. In most cases teachers were providing a line on a worksheet that simply said: 'What did you find out?'

Level 2 (2 marks): students need to draw a simple conclusion. Many students found this difficult and moderators noted that in many cases teachers had been too generous in awarding this mark.

The student is required to take a step beyond simply repeating the result and try to say what this means. For example:

> Result: 'I found out that the hotter the oil the quicker it ran down the tile'
> Conclusion: 'This means hot liquids are less viscous (runnier) than cold liquids'

Level 3 (3 marks): students need to make a simple evaluation. In some cases moderators found that schools had been too generous by awarding three marks when all the student had said was: 'I think the experiment worked well', without giving any justification for this.

For full marks in skill area E there needs to be evaluative comment about the success or otherwise of the investigation. This evaluation must use results from the investigation eg anomalous results or repeats being similar.

Mark Ranges and Award of Grades

Grade boundaries and cumulative percentage grades are available on the Results Statistics page of the AQA Website.