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# Entry Level Certificate

# SCIENCE

5960

Report on the Examination

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June 2018

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## General

2018 is the first full assessment and award of ELC Science 5960 following the review of the KS4 Programme of Study.

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 centre and students. Both single (5961) and a double (5962) awards are available.

The subject content is split into six components from each of the three 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 Assignments (TDA).

For the Double Award, work from all six components must be submitted. For the Single Award, work from three components, one from 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 awarding in 2018, 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 centre wishes to practise ESAs then they should use the specimen ESAs and mark schemes available on the AQA website.

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

AQA provides support and guidance for centres in a variety of ways. These include:

- Feedback forms (CAW/FB) from moderators to centres
- ELC Coursework Adviser
- Specification Support Material and Teachers' Guide to be found on the AQA website
- Reports on previous series: these can be found on the AQA website
- Teacher on-line standardisation (T-OLS)
- On-line CPD: details can be found on the AQA website.

## Administration

Marks are submitted electronically using the E-subs system. This has proved to be beneficial to both centres 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 centres and AQA of any mark changes.

Common themes noted:

- Centres not acting on MOD/CEN/ADM/E-SUBS forms and not going back into E-subs to correct marks. This means that moderators cannot enter their marks and the centre may then wrongly go out of tolerance.
- Withdrawing all students and not amending this on E-subs. The centre then sits in the 'Awaiting Centre Marks' section of the system and the process cannot be completed. There are also issues if students are registered to one centre but are taught at a different institution – this has sometimes lead to to inaccuracies or lack of information about the status of a student.
- Most centres managed to meet the 15 May deadline for submission of marks. However, with E-subs, centres can upload marks and submit the sample to the moderator before this deadline. If they do so, this greatly helps the moderation process. However, some centres did not inform AQA of the need for an extension to be granted.
- Most centres supplied the Centre Declaration Sheet. For NEA (Non-exam Assessment), this is essential to authenticate students' internally-assessed work and confirm the internal standardisation of marking.
- Most students signed the CRF. Failure to do so can result in a delay in the moderation process.
- Some centres sent bulky folders containing the complete portfolio of notes, worksheets, etc. These are not only superfluous to the moderation process but hamper the moderator's work; moderators require only the marked ESAs and TDAs which have contributed to the subject total mark. The portfolios should be presented with the ESAs and TDAs collated for each student with the CRF showing the mark analysis at the front either in a card folder or held together with a treasury tag and not submitted in A4 plastic wallets.
- The student's name and number and the centre number should appear on all the pages of the student's work.
- For the Single Award almost all centres correctly submitted evidence from three different complete components. Students who did fail to complete any of the required components may still be entered for an award – they simply score 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, an entry for single award could well be advantageous. This can be done free of charge up until the date stated in the Exams Administration part of the AQA website.

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## Marking of the ESAs

The standard of marking of the ESAs was good this year. The great majority of centres adhered 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.

Moderators need to be sure that all student responses have been seen and marked accordingly.

Students should be given verbal feedback about their achievement and the ESAs then stored securely until required for moderation.

Some centres used specimen ESAs or those from the previous specification (5948). Specimen papers may be used these for practice but they must not be used for submission for an award. The style and content has changed somewhat from 5948 so use of past papers for practice purposes should take this into account.

Centres are reminded that ESAs must be undertaken in a high control setting; there is a full range of access arrangements available for those students who require them. However, centres should remember to include the appropriate JCQ cover sheet.

## 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 is not able to provide written evidence of their achievements, annotation must be provided to justify the award of marks in a skill area. This is particularly important for the ephemeral skills B1 and B2 and also to justify the award of 3 marks for Skills C and D for a student's unaided work. 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.

If a student has a scribe/reader, this should be noted on the CRF and relevant work and the appropriate JCQ form should be included in the portfolio.

Centres are reminded that, although there may be discussion about how to go about an investigation and students may work collaboratively to obtain results, the write-up of an investigation must be individual work. Once completed and marked, students may be given verbal feedback about their achievement but the work must not be returned to them but stored securely until required for moderation.

### **Choice of suitable investigations**

Nearly all centres 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 or with an adviser. Centres continue to be encouraged to develop new ideas for TDAs so that they fit in with the centre's teaching and learning program.

Some centres include photographs showing students at work. It is pleasing to see evidence that students are enjoying their practical work.

It is evident that a number of centres are co-teaching ELC with the GCSE Combined Science: Trilogy specification and therefore submitted TDAs based on the Required Practical Activities for the GCSE Combined Science programme. These are, as stated, practicals, not investigations. Care needs to be taken that the practical is adapted so that it does allow ELC students to demonstrate achievement in all the Skill areas, particularly in Skill areas A, C and D. The work must also be part of the ELC specification eg Hooke's Law is not required for ELC and cannot be submitted.

A number of centres undertook the paper chromatography practical. In this instance, the investigation must be devised to enable students to gather numerical values in order to score in Skill areas C and D. Other investigations relating to microbiology also only yielded qualitative results which limited access to Skills C and D. It is also important that microbiology investigations comply with recommended procedures to ensure safe practice.

#### **Worksheets:**

- It is helpful if the task is phrased as a question that can be answered by carrying out the experiment; the worksheet/template may include some information from the specification to set the scene for the student.
- Many centres used or adapted the templates available on the AQA website. These demonstrate the appropriate level of prompting that can still access the full mark range.
- Some centres produced excellent worksheets for their students. These can be very useful providing that they are generic and not specific to a particular investigation. In a few cases the worksheets were over-prescriptive: this limits access to higher marks in some skill areas.
- Where worksheets were not used, students generally scored fewer marks.

If a centre 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. The list should be generic in nature so that there is an active selection on the part of the student. There should be an opportunity to add investigation-specific equipment.

**Level 2 (2 marks):** students need to describe the way in which the technique or equipment could be used. The student's method should be capable of producing sensible and meaningful results. The method should enable another person to carry out the experiment.

Some students find extended writing a challenging task and may need structured support to gain marks. Students may not gain marks for copying out a given method; however, they may achieve this level for ordering a set of instructions correctly or 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.

A labelled diagram showing how equipment was set up may also enable them to demonstrate achievement at this level without extended writing.

If none of the above are sufficient to enable the student to gain marks, a given method would still allow progress to achievement in the other skill areas.

**Level 3 (3 marks):** students need to make a simple prediction and give a reason for this so that it is more than a guess. Most students made a good attempt at a prediction. Teachers are asked to encourage their students to make a prediction based on either scientific understanding or general knowledge.

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## 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?

Written statements as to how the student worked safely must be relevant to the investigation undertaken not merely generic statements such as ‘wear goggles’ irrespective of the context.

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. Centres should remember that there is a full range of access arrangements available for those students who require them. However, centres 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. Students may gain credit here for either repeating tests to obtain a mean or by reference to the variables and how these were controlled to achieve a fair test.

If students work in small groups and then pool results, it is important the contribution of an individual student is evident in the account of the investigation.

## 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 centres 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 template with headings can be provided: this would then limit the award to a maximum of two marks for correct completion.

For Level 3, tables should have the correct headings and units. There were some instances of 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. This may be an instance where a ‘best fit’ of 2 marks may be awarded for an imperfect attempt by the student. Unaided work should be annotated to this effect.

## Skill area D: presenting data

The criteria for achievement in this skill area are limited to graphical representation. Inclusion of photographic evidence of microbial growth or chromatograms cannot be credited.

**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 the AQA template and in other worksheets, students are asked to select the appropriate format: this enables students to gain this mark even if they were unable to produce the actual graph. It was noted that in some instances, the mark was awarded 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 centres 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 centres 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 has 2 mm<sup>2</sup> grid lines.

It is important that teachers check that students have:

- shown the correct labels and values on each axis
- plotted the values correctly
- and, if appropriate, drawn a line of best fit.

There were a number of instances of Level 3 being awarded 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 and be annotated as the student's unaided work.

## 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 there were a number of instances of over-generosity 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’

A well-constructed worksheet or template may have included some information from the specification in the introduction which would enable the student to draw a sound conclusion. Exemplars may be seen on the AQA website.

**Level 3 (3 marks):** students need to make a simple evaluation. In some cases moderators found that centres had been generous by awarding three marks when all the student had said was: ‘I think the experiment worked well’ or said ‘do it again’ without giving any justification for this.

For full marks in Skill area E, there needs to be an evaluative comment about the success or otherwise of **this** investigation. This evaluation must use results from the investigation eg anomalous results or state that the conclusion is sound as repeats are similar.

## Mark Ranges and Award of Grades

Grade boundaries and cumulative percentage grades are available on the [Results Statistics](#) page of the AQA Website.