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Moderators' Report/ Principal Moderator Feedback

GCSE Science 2011 (5SC04) Paper 01

2SC01 Science

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Overview

The controlled assessment unit forms 25% of GCSE science 2011 specification. Controlled assessments are based on specification statements or 'further suggestions for practical work'.
There are three parts to the controlled assessments: A, B and C. Part A is a planning task, Part B is an observations task and Part C is a conclusions task. A candidate must submit one mark from each part and these may come from a single controlled assessment task. Marks from the best of the candidate's work can also be submitted. For example, Part A from Biology, Part B from Chemistry and Part C from Physics, or any other combination of subjects. However, a candidate must complete a full controlled assessment task to submit a mark for one part. All work for a task needs to be sent for moderation, rather than just the part for which the mark is being submitted. This enables moderators to evaluate all three parts of the controlled assessment tasks within the correct context.

Controlled assessment tasks are available approximately one year in advance of each examination series, but teachers must note that these tasks are only valid for that particular series. The next moderation session will be in summer 2014

General comments

The Principal Moderators are pleased to report that centres have for the most part interpreted the assessment criteria appropriately. There were some new centres that submitted work for moderation for the first time in this moderation window. There was good agreement with the marks awarded by many centres and this clearly reflected the time and effort taken by teachers to attend Edexcel training events, to familiarise themselves with the assessment criteria and to share good practice within centres through internal standardisation.

The majority of centres used the workbook provided by Edexcel, at least in part. The sub-sections of the workbook gave candidates a good idea of what they needed to do to address the criteria for a particular Section.

Some centres adapted the workbooks to provide candidates with more space for responses, but importantly, kept the wording the same; this is acceptable practice. . However, it is imperative that the wording is kept the same; otherwise candidates in some centres may gain an unfair advantage in terms of being provided with too much scaffolding. Alternatively, candidates may be disadvantaged by not being provided with all the information they require to complete each section correctly.

Some excellent detailed work was also submitted on loose-leaf A4 paper, although moderators commented that in some instances work in this format lacked structure and focus and was not always annotated adequately.
It should be noted that evidence to support a mark may be found 'out of place' in different sections of a candidate's workbook, e.g. information about equipment or controls could be written in the plan and they should be credited accordingly. Careful annotation is essential for the moderators in these situations.

All three tasks were seen and most centres submitted marks for a single task. Submitting a combination of marks from different controlled assessments was less common. The C1 task on indigestion and P1 task on power were seen more often than the B1 task. In previous series this was because centres had often used the biology as a practice piece.

Some excellent annotation was seen on scripts, demonstrating that some teachers have an excellent grasp of how to interpret and apply the generic assessment criteria. Unfortunately such good practice was not uniformly widespread across all centres. The work received from some centres had either no, or minimal annotation, or was just ticked in various places, this was particularly unhelpful where candidates submitted their responses on A4 paper where it was unclear which aspects of the criteria were being addressed in a particular paragraph. It should be noted that annotation is a JCQ requirement which not only aids moderation but, more importantly, enables accurate assessments to be achieved. The most useful annotation seen used the coding's from the generic assessment criteria, e.g. i.e. 1-2a, 3-4 b.

Centres continue use the specific marking guidance for each controlled assessment task to aid their assessment decisions. The specific marking guidance provides examples of responses that can achieve particular marks. It is important that the generic criteria are used to make holistic judgements about a candidate's overall performance.

<u>Comments on the performance of candidates and the application of the assessment criteria</u>

In general, Parts A and B gave candidates across the ability range the opportunity to demonstrate positive achievement in all sections. The Conclusions section discriminated more in terms of the performance of stronger candidates over weaker candidates. More blank sections were seen in Part C of the workbooks compared with Parts A and B.

Part A Planning

The equipment section was well answered and many candidates gained 4 marks here, with useful diagrams often supporting the mark awarded. However, some candidates missed out the range of essential items such as the indigestion remedy in the C1 task, and were awarded full marks inappropriately. Weaker candidates found it difficult to explain the reasons for their choice of equipment.

The majority of candidates were able to identify relevant variables to control and could describe how this would be achieved. Fewer candidates could develop their ideas and explain how to control the variables. In some cases candidates were given high marks for simple responses such as 'keeping things all the same' or 'keep it a fair test'.

Some good responses relating to risks were seen. However, many candidates found it difficult to achieve high marks in Risks. Too many candidates failed to identify the specific risks of an investigation, although most mentioned the generic laboratory risks.
However, centres should guard against awarding high marks for generic comments such as 'risks from breaking glass' or 'put all bags and stools under benches'. It is important that the risks identified are relevant and specific to the task, e.g. identifying that acid is an irritant, or that the bulb will become hot.

The majority of candidates could write an ordered method that would produce results and hence gain two marks. To gain the marks for 3 – 4 (a) and (b), candidates must explain why their method would test the hypothesis and explain why a particular range of measurements were chosen; this last aspect remains a problem for some centres and has led to some centres giving full marks in this section when this should have not been the case. Candidates were scoring the 3 - 4 (b) mark more often than in the previous series. It was encouraging to see that the Overall Plan section had been marked accurately in many centres, although generous marking was not uncommon.

Part B Observations
Candidates performed well in this section of the controlled assessment. In many cases 3 or 4 marks were scored for 'Primary evidence and recording', even when candidates found other areas of the assessment difficult to access. Tables tended to be well drawn with good headings and units included. Many candidates also include processed evidence, e.g. averages, in tables with their primary evidence, which is a logical thing to do. However, centres should remember to assess averaging and other mathematical processes in Part C.

If candidates lost marks in this section it was usually because they failed to include a piece of secondary evidence or more commonly did not discuss the reliability of the source of the evidence they collected. The generic assessment criteria state that secondary evidence should be collected and recorded. Some excellent practice was seen where relevant secondary evidence had been collected in the form of data, e.g. results from other groups of candidates, graphs or factual information. In some cases candidates discussed secondary evidence, but no supporting information was provided for the moderator to see. It is acceptable for centres to provide a range of sources of information from which candidates can select the material that they consider to be the most appropriate. Comments must be made about the quality of the sources of secondary evidence to gain two marks for this section; however comments about the quality of the sources were often quite weak or missing altogether. These discussions were usually based on the reliability and accuracy of the data, rather than how reliable and trustworthy the source of the evidence was. It is often easier for candidates to use secondary evidence in Part C if it is quantitative, but of course, this is not essential.

Part C Conclusions

This section discriminated well between candidates of different abilities.
The conclusions section was one in which the weaker candidates gained few marks, especially when the workbooks were not used. Some candidates and occasionally teachers still seem to be confused about the difference between evaluating the conclusion and evaluating the method. Students often made comments about the quality of the evidence and reliability of the data in the evaluation of method section and this was often credited erroneously . However, students should have been discussing the strengths and weaknesses in the method.

A large number of candidates demonstrated that they were able to process and present evidence. In many cases processing requires little more than averaging collected data or re-ordering data to show a clear trend. Centres should check that processing has been done correctly, because there were a number of cases where candidates' mathematical skill had let them down, yet their work had been marked as being correct. As mentioned in the previous section, it is also important to look for evidence of processing in Part B.
Line graphs and bar charts were frequently drawn correctly, but in some instances full credit was given even when there were obvious errors in scaling and labelling axes, or plotting points or when a line graph was drawn for a discrete variable. There was also a minority of centres where candidates had not processed the evidence at all and had erroneously awarded 4 marks. Centres should be reminded that the criteria require processed evidence to be presented.

The quality of evidence section was challenging for weaker candidates, particularly 3-4 (a). It was apparent that many candidates had clearly not looked at their evidence with sufficient care, and made sweeping comments about anomalies. Obvious anomalies were sometimes ignored, yet the text in the section claimed that they had been dealt with. It was also apparent that some candidates did not know how to deal with anomalies appropriately and this is a broad issue that needs to be addressed. Centres are reminded that the 1 – 2 mark (b) statement requires candidates to comment on the quality of their secondary evidence, but this aspect was not always addressed particularly well and full marks awarded without reference to this criterion. More candidates than in previously session had used their secondary evidence and plotted the data alongside their primary data. This enabled them to see and deal with anomalies in the secondary data to gain 3-4(b). Candidates who had used data from other students usually performed above average in this section as they had data similar to their own and were able to look for and deal with anomalies in the same way as their primary data.

Some excellent conclusions were seen where there was a detailed discussion of relevant scientific ideas and the hypothesis had been referred to appropriately. However, moderators remarked that some assessments of this section were generous because responses were brief and clearly lacked the detail needed to match the criteria for 5 and 6 marks. In particular for 5 -6 (a) and (b) the use of scientific ideas needs to be present to explain the conclusion. This is an area where centres need to give time in formative work prior to taking the task to practice the points already mentioned. Candidates should be encouraged to look carefully at their evidence for mathematical relationships. At a low level this

could include a comparison of quantitative evidence or an intermediate level reference could be made to data points. At higher levels this could develop into comments about the impact of one variable on another, such as '*if x is doubled, y is doubled'*, or reference to the gradient of a graph. Many candidates were able to score 3 or 4 marks. The biggest area of challenge for students was in identifying the mathematical relationships in the data and therefore getting beyond 3-4 (b) in the 'b' strand of conclusions.

Most candidates were able to score one mark for evaluation of conclusion by discussing the need to repeat data and so scored 1- 3 (b). Only the most able candidates scored well on the evaluation of conclusion section. Evaluation remains a real discriminator of ability. It is important that candidates use all the evidence available to them when writing about the conclusion. Comments were often very simplistic, particularly when suggesting how the evidence could be improved. When candidates used the workbook they often wrote some creditworthy comments as a result of having the guidance provided at the top of the section in the booklet. Statements such as 'do the experiment better', 'do more repeats' or 'do the experiment more accurately' were not uncommon and such stock answers do not show that the candidate understands the issues related to the particular task in question. Indeed, some candidates who suggested further repeats had already carried out a suitable number of repetitions. In some instances these low-level comments had been awarded high marks. References to scientific ideas are needed for the 3 – 4 (a) mark and for 3 – 4 (b) candidates need to suggest how to improve and extend their evidence. It was noted that where the workbook had not been used, lower scoring candidates scored poorly here. The workbook assisted students in structuring their response and they were more likely to score at least one mark, if not two.

There was greater opportunity for weaker candidates to gain marks when evaluating their method. The emphasis of this section is an evaluation of the method in terms of the equipment used and the procedure. In some cases candidates interpreted this as another opportunity to discuss the evaluation of the conclusion. Many candidates could state a strength or weakness in their method and suggest how to improve it. This section proved to be more accessible however some candidates wandered off the point and gave examples of strengths/weaknesses that were irrelevant to the task. Some said' it was easy or 'I enjoyed it', as strengths. These are clearly not strengths of the method. Candidates found it easier to identify weaknesses. Candidates should be discouraged from making comments such as 'use better equipment' or 'use a computer' when discussing possible improvements to a method. Improvements should relate to the method used and should be justified. Few candidates specifically discussed how their method could have produced anomalies and how changes to that method would minimise anomalies and improve the quality of the evidence. Very few candidates scored either 5 -6 (a) or 5-6 (b) as the quality of their discussions was too weak to merit this.

Administration

The deadline for the submission of work to the moderators was 15th May; this is a national deadline and is the same every year. It was pleasing to note that the majority of centres sent their samples of work by the required deadline. However some centres were considerably late in submitting samples to moderators. It was frustrating in some cases to have work arrive by the correct date, but for the moderator to then find the sample was incorrect. There were still a notable number of centres failing to include the work of the highest and lowest scoring candidates in addition to the randomly selected sample of candidates asterisked on the OPTEMS. This meant that moderators had to email centres to request the missing work. Most centres were then very good at getting this work to the moderators. However, there was a small minority of centres who ignored this request and had to be contacted again. It should also be noted that if a selected candidate is absent, then the centre should select a replace candidate so the moderator still receives a full sample of candidates work.

The moderators' work was made difficult in cases where there were no record sheets to identify the marks awarded for each Part and section of the Controlled Assessment Tasks, particularly when more than one task contributed to the final mark. A suitable example of a record sheet can be found in Appendix 5 of the specification and this also includes a declaration of authentication.

In addition many centres failed to identify on the record sheet which subject the marks were being submitted from. This was not a problem where only once piece of work was submitted. However, when the marks came from two pieces of work, it was difficult for the moderator to know which marks came from where.

Centres should note that it is not necessary to send any work that does not contribute to the final mark. For example, if Biology does not contribute to the final mark submitted, then it is not necessary to include work for that task with the moderation sample. However, if a centre is submitting section C for assessment, section B will need to be provided also, so that any processing of the results and identification of anomalies may be seen.

Further support

Science subject advisor
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Contact us on 0844 576 0037

Ask the expert
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Training events
Please check the Edexcel website for full detail of all training events.
www.edexcel.com/resources/training/Pages/default.aspx

Consultancy Service

GCSE Science 2011 controlled assessment consultancy service

The consultancy service is designed to support you, with controlled assessment for GCSEs in Science. It's a free online system, available though Edexcel on line. It allows you view and practise marking some exemplar student work and provides you with commentaries from a senior moderator. This helps build your confidence and understanding of how to apply the new assessment criteria before you mark your actually students' work.

The consultancy service will be available from 1 October 2013 until 14 February 2014 for GCSE Science, additional Science and separate Science units (5SC04 5SA04, 5BI04, 5CH04 & 5PH04)

Grade Boundaries

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