



General Certificate of Secondary Education

**Applied Science (Double Award)
4861**

APSC3 Developing Scientific Skills

Report on the Examination

2009 examination – June series

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General comments

Activities

A good range of tasks was seen this summer, usually set in a vocational context. However, a lot of downloaded material or material copied directly from text books is still being credited as the candidates' own work across both units. Such work should not be credited unless it has been clearly rewritten by the candidate in their own words.

Assessment

Many centres are including tick sheets at the front of each piece of work and in most cases these are very helpful to the moderator. On occasions, however, annotation was then absent from the work or the mark on the tick sheet and that awarded did not match. It is vital that the work is annotated next to the evidence for the mark.

Presentation of work to the moderator

Work was generally well presented and most centres had adhered to the request not to use bulky folders. There are still some centres who are using either elastic bands or paper clips to hold work together which can cause pieces to become detached from each other. There were also still a number of centres who included work in plastic wallets, which slows down the moderation process. Please punch and tag the work in the top left-hand corner so that all of the work is correctly orientated and in the order set out on the Candidate Record Form.

One of the main problems this session was that paperwork was sent to the wrong moderator which slowed down the moderation process. Some centres still do not adhere to the AQA deadlines, which severely hampers the process.

A number of centres are still including theory work done in the classroom. There is no need to include this work unless it is credited as part of the investigation. Many centres are also making candidates write out methods for each practical in both Unit 3 and Unit 4, which is not necessary. The only piece of work that requires a plan is Monitoring a Living Organism in Unit 4 since this is part of the assessment criteria.

Further support

Teachers are encouraged to make the full use of the guidance available.

- The Teachers' Guide gives more detailed information on portfolio marking.
- The document "Coursework information for centres" details general information about entries, gives notes on each of the units including appropriate tasks, administrative procedures and the role of the Portfolio Advisor.
- Centres can also access Ask AQA and the Science forum on the AQA website.

Strand A: Planning and Following Instructions

Centres are getting better at assessing Skill A but a number are still over-marking the risk assessment. At Stage 2, and Stage 3 particularly, the risk assessment must be complete and comprehensive. This means that all hazards should be included and that they must be specific. For example 'chemicals' is not sufficiently detailed: candidates must mention specific chemical for example 'hydrochloric acid' or 'sodium hydroxide'. At Stage 2 and Stage 3 the risks need to be detailed and **must** be correct. For example, it is unlikely that the sodium hydroxide that candidates are using is corrosive.

At Stage 3, the risk assessment should be both complete and comprehensive and completed independently even if the risk assessment has been carried out independently if major parts are missing, a Stage 3 mark should not be awarded.

Strand B: Obtaining Evidence by Experimenting

The marking of Skill B was more accurate, although some common errors are still occurring. Tables missing headings and units are still being credited for 2B3, and teachers should remember that to get the 2B3 and 3B3 marks the candidate must draw a graph with an accurate line of best fit. Many instances were seen of bar charts being credited with 2B3 and even 3B3, which is incorrect.

For 3B1 all of the decimal places need to be consistent and the units must be at the top of each column. To award 3B2, teacher annotation should show that repeats were carried out independently and this **must** be accompanied by a student explanation of why repeats were done, which **must** be more comprehensive than 'to make it fairer or more reliable'. Prepared tables are still being awarded full Stage 3 marks even though 2B3 and 3B2 can not be awarded because headings and units have been provided and the candidate has not independently repeated. Similarly, if the method provided includes instructions to repeat the experiment, the candidate cannot achieve 3B2 because they have not independently chosen to repeat.

Titration experiments are still being credited with full marks here even though graphs with lines of best fit were impossible to draw. The guidance on this is very clear: the maximum mark that can be awarded is 10 (this is the only example of where credit can be given out of an incomplete stage).

Strand C: Analysing and Considering Evidence

At Stage 1 marking was generally accurate. On a few occasions, centres are awarding marks above Stage 1 when there is either no comment or no calculations. There are still a number of centres who are awarding 2C1 for a simple statement without any reference to the data collected during the investigation. Two marks may be awarded for 2C2: one for accuracy and the other for consistency. Where only one calculation has been performed (for example, either one average or one magnification) Stage 2 can not be awarded since it is impossible to judge if the calculations have been carried out consistently. To award 3C1, the data should be quantitative and once again refer to the actual results.

To achieve 3C2 candidates must provide evidence explaining how they have rearranged an equation such as $V=IR$ or show understanding in a molarity calculation. Simply substituting numbers into a prepared formula should gain only Stage 2 credit.

Strand D: Evaluating Evidence

Evaluations have improved and most centres now ensure that improvements are justified before awarding 2D2, although a number still award Stage 3 marks for one or two sentences or a list of bullet points instead of a detailed evaluation. A detailed discussion of the strengths and weaknesses is required for 3D1 and a detailed evaluation of the improvements to the method and *how* these can help to collect more reliable data is required for 2 marks at 3D2.

Strand E: Vocational Application

The best responses seen in this strand were from centres where the entire investigation was set in a vocational context by "setting the scene" at the start. If the context is tagged on at the end, candidates find it difficult to relate this section to the rest of their work. It should be noted that it is the investigation and **not** the equipment that should be discussed in this section. For example if candidates have been investigating the effect of temperature on yeast using a microscope, it is the growth of yeast in different temperatures that should be discussed (for

example in relation to the brewing industry) not the use of the microscope. At Stage 2, workplaces should be specific named ones rather than a general one such as 'electricians' or 'doctors'. For 3E1 scientific explanation is expected when relating the usefulness of the investigation to a scientific workplace. For 3E2, candidates should be encouraged to name organisations and include a few sentences rather than simply copying and pasting addresses off the Internet.

Mark Ranges and Award of Grades

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