

Stage 1 Mathematics

Subject Assessment Report 2013



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Stage 1 Mathematics Subject Assessment Report

Overview

At Stage 1, a number of subjects are moderated: the English subjects, the mathematics subjects, and the Personal Learning Plan. For most schools, only the work of students who achieve C and D grades is moderated because the C grade represents the minimum grade required for SACE completion.

Stage 1 assessment reports give an overview of how students performed at the C and D grades relative to the learning requirements, assessment design criteria, and performance standards set out in the relevant subject outlines. The assessment reports provide information and advice on: teacher engagement and student engagement with the assessment types, including task design; the application of the performance standards in school assessments; and the quality of student performance.

Assessment Type 1: Skills and Applications Tasks

Successful Achievement at the C Grade

Students tended to achieve at the C standard when they generally gave correct solutions to routine questions in a range of topics, and used appropriate notation, representations, and terminology. When teachers devised tasks that gave students opportunities to answer routine questions with and without the use of technology, they were able to provide evidence at the C standard.

Application of the Performance Standards

In their assessments of students' work, some teachers attached performance standards to each task and highlighted the relevant grade descriptors. This provided feedback to students about the level at which they had achieved in comparison with the performance standards, and was useful to moderators when confirming assessment decisions.

Many teachers used both marks and percentages when assigning the final grade to skills and applications tasks performed by students. In most instances, when the skills and applications tasks were well-constructed — with a balance of routine and complex questions — the percentage given to students matched the grade on the performance standards. However, there were instances where the percentages did not align with the grades and descriptors of the performance standards. Assessment decisions must reflect achievement which is in line with the performance standards, and not simply be a conversion from the percentage value.

Variations in the application of performance standards were noted in some schools, where multiple classes with different teachers provided samples for moderation which were inconsistent. The moderation panel has to assume that a school applies the performance standards in the same way; thus, teachers need to confirm any

assessment decisions within their school to ensure the performance standards have been applied consistently.

'Error follow-through' was evident in a number of instances, where students carried out the correct process in answering problems even though there was an initial mistake early in the working. This should be noted by the teacher and rewarded in terms of assessing student application against the performance standards.

Task Design

Generally, the skills and applications tasks contained a very good range of routine and complex questions. This gave students the opportunity to produce work which warranted an A grade in the performance standards. Where 'test generator' questions were used, students often had less opportunity to engage in more complex questions in unfamiliar contexts.

Some skills and applications tasks contained only routine questions that provided students with the method to be used in the solution. This limited students' ability to show initiative and provide evidence higher than at the C grade.

Some teachers chose to divide skills and applications tasks into two parts (A and B) for this assessment type, sometimes resulting in a total of six smaller tasks. This made it difficult for those schools to complete the assessment program in time for moderation and thus student work was unable to be moderated. It is not necessary to assess all content of the chosen topics in the skills and applications tasks; instead, the folio tasks allow scope to do this. It is not recommended, nor advisable, to divide skills and applications tasks into two discrete parts. However, if teachers take this route, it is recommended that each part be a maximum of 45 to 50 minutes.

Assessment Type 2: Folio

Successful Achievement at the C Grade

To successfully achieve at the C standard, students needed to achieve tasks early on in their folio that showed an ability to apply basic skills through answering routine questions and following structured investigations.

It is important that students use a report format for their folio tasks, beginning with an introduction that outlines the mathematical problem to be explored and the context of the investigation. The main body of the folio should include evidence of the method used to find the solution(s), in terms of the mathematical model or strategy; collection or generation of relevant data and/or information; mathematical calculations and results; analysis and interpretation of results; and reference to the reasonableness and limitations of the interpreted results. The conclusion should be given in the context of the original problem and provide an evaluation of the results. Appendices and a bibliography should be included, where appropriate.

Application of the Performance Standards

Most teachers used the updated performance standards for Stage 1 mathematics when submitting work for moderation. This was particularly important for moderating

group investigations because specific feature MMP5, which assessed collaborative work, is no longer in the subject outline and thus evidence of group work was not required. Where students worked collaboratively, it was necessary then that individual contributions were evident in the student work so that they received credit for their work.

Most teachers confidently interpreted the performance standards at a C grade and provided feedback to students by shading the relevant grade descriptor that aligned with their evidence of learning so they could clearly see at what level they had achieved.

It was evident when samples were drawn from different classes that some inconsistencies in the application of the performance standards had occurred within schools.

Task Design

A range of innovative topics was observed in this assessment type. Some schools designed folio tasks relating to real-life situations in their local community, such as using trigonometry to model buildings and tree heights, and using mathematical functions to design a skate park. The better folio tasks were designed as investigations rather than as an assignment. This gave students the opportunity to provide evidence that could be measured against the performance standards, particularly those of 'mathematical modelling and problem-solving'.

When designing folio tasks, it is useful to start with a more directed component that enables students to achieve a C grade, and follow this with successively more open sections that allow students to demonstrate their achievement at higher grades. Highly directed tasks rarely provide sufficient flexibility for students to provide evidence which will achieve higher than a C grade.

Preparation and Packaging of Student Materials

Student materials were predominately packaged appropriately, obviously following the guidance provided in the Preparation and Packaging of Materials for Stage 1 Moderation information sheet. When teachers included a summary sheet indicating the individual students' results for each assessment, and their name and/or SACE registration number, this made the work easy to access and process. It is important that the grade assigned to the student work matches the one written on the Moderation Sample form submitted with the materials; some discrepancies were observed. Moderators are advised to assume that the grade on the signed Moderation Sample form is correct, and moderate accordingly.

Teachers are reminded to select and submit samples according to the instructions outlined in the *Stage 1 Information and Guidelines*, which require a *maximum* of three sets of evidence representative of each of the available C, C*, D*, and D grade levels (an asterisk indicates a borderline result). This means that a maximum of 12 samples per subject are required, irrespective of the number of mathematics classes in the school. Some schools provided more than three sets of evidence for the respective grade levels and thus were in excess of the requirement. Schools should

also note that they need only to provide samples of adjacent grades (e.g. B grade) if no C or D grades are available.

Moderation at Stage 1 can only proceed when schools provide a full set of evidence (or awaiting only a final task) as outlined in the approved learning and assessment plan. Some schools provided work missing several tasks which then could not be moderated. Having tasks that were *not* divided into two parts facilitated the completion of the assessment program as students were undertaking a maximum of five tasks for a 10-credit subject.

It was easier for moderators to see evidence of teachers' assessment decisions when student materials were clearly labelled, and a teacher pack (containing the approved learning and assessment plan, task sheets with solutions, and marking schemes and/or guidelines) was provided.

General Comments

Teachers are encouraged to access the interactive clarifying activities on the Stage 1 Mathematics minisite (Support Materials > Clarifying Activities) to help them interpret and consistently apply the performance standards to student work. Once teachers submit their assessment decisions on the provided samples of work, the annotated versions and assessment decision regarding the student responses can be downloaded and viewed.

Many learning and assessment plans were modified during the semester as the teaching and learning program progressed. When modifications are made to the approved learning and assessment plan, teachers should record changes on the addendum page and have the principal (or delegate) sign to ensure the changes still meet subject outline specifications.

It was evident many teachers conducted a prior internal moderation within the school, because moderators acknowledged the consistency of standards. Teachers' marks and comments on the work submitted aided the moderation process.