# Stage 1 Mathematics

# Subject Assessment Report

## Overview

At Stage 1 the English and mathematics subjects and the Personal Learning Plan are moderated. For most schools, only the C and D grades are moderated, as 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 in their school assessments, relative to the learning requirements, assessment design criteria, and performance standards set out in the relevant subject outlines. They 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 Application Tasks

Successful achievement at the C grade

* Students achieving at the C standard were generally able to find correct solutions to routine problems, and attempt some complex problems, providing evidence of CT2.
* The interpretation of mathematical results was generally appropriate, with some logical conclusions being made. To support students to develop their interpretive skills, opportunities should be provided in all SAT’s to allow for contextual interpretation of mathematical results.
* Generally appropriate use of mathematical notation and representations were seen, and generally effective selection was made of algorithms to solve problems that were routine in nature.
* Opportunities that enabled students to provide evidence of use of electronic technology were responded to with generally appropriate and effective use.

Application of the performance standards

* Schools are encouraged to be selective in assessing the performance standards across the set of SATs. A number of schools submitted LAPs which showed an expectation that students demonstrate evidence against the majority of the performance standards for each assessment. It is important that the SAT provides the opportunity for students to provide clear evidence of the performance standards identified for assessment.
* On occasions, schools with more than one teacher showed significant variation in the way that teachers applied the performance standards. Schools with more than one Stage 1 Mathematics class are strongly encouraged to conduct internal cross moderation to ensure consistency of assessment against the performance standards across the school.
* In some cases, inconsistencies were noted between the performance standards identified on the LAP and those that were actually assessed in the task. Teachers should use the addendum to note any variations to task design.
* Inconsistencies were noted by some teachers in their interpretation of the performance standards at the task level. However, overall, assessment judgements were appropriate.
* There was evidence of teachers using percentages to determine student grade level achievement rather than assessing against the performance standards. While the percentage may provide a starting point for considering the grade achieved, the performance standards should be used to confirm the overall assessment decision, particularly within an assessment type.
* Some teachers provided an individual shaded performance standard for the SATS overall which made it clear for moderators, and students, how the grade for the assessment type was determined.

Task design

* Effective task design meant that in general the proportion of marks gained by students aligned to the appropriate grade band in the performance standards. Around 60% of the questions should be routine in nature (including both calculations and interpretation), and around 30% should be complex calculations.
* Some SATs featured too many routine questions which limited the opportunity for students to achieve above a C grade. Other SATs featured a large proportion of complex questions which provided limited evidence for some students to demonstrate achievement at the C grade.
* Teachers should ensure that students have more than one opportunity to provide evidence of any specific feature identified for assessment. Where limited opportunities for evidence to be provided were available in a task, students were disadvantaged when they missed that opportunity with an ‘I’ being the only level they could achieve.
* Most teachers assessed a range of specific features in the SAT’s, particularly for Concepts and Techniques. However, some tasks did not provide the opportunity for students to demonstrate interpretation of mathematical results (RC1), understanding of reasonableness and limitations (RC2), or development and testing of valid conjectures (RC5). Providing opportunities to assess these specific features in SATs provides good preparation for Stage 2 assessments.
* Generally, SATs became more challenging as students worked their way through them. This enabled students to demonstrate their performance against the C grade band early on and attempt more complex questions later.
* The assessment of CT4 – use of electronic technology to find solutions should only be assessed in SATs where clear evidence of use of technology can be seen through the questions asked.
* Moderators were pleased to see examples of students demonstrating evidence of collaboration in the SATs.

Assessment Type 2: Mathematical Investigation

Successful achievement at the C grade

* Students achieving at the C standard were generally able to successfully complete Part A and some of Part B of investigation where the investigation was created with three sections: Part A providing support to get the students engaged; Part B requiring guided investigation and Part C providing an open-ended investigation prompt.
* Students achieving at the C standard were, in general, able to follow and complete mathematical procedures at an appropriate level and demonstrated ‘Concepts and Techniques’ at a C level or higher.
* A considerable amount of sample work at the C standard showed very little or no evidence of attempting to develop or test a conjecture, or discussion of reasonableness and limitations of results.
* More successful investigations gave students the opportunity in Part C to identify their own problem to solve, which generally resulted in a higher level of engagements and achievement.

*Application of the performance standards*

* When teachers provided written feedback relating to the performance standards on the investigations, it was easier for moderators to understand how the grading decision had been made.
* Moderators noted that where inconsistent application of the performance standards existed within a school it reflected a limitation of the task. Poor task design that limited the possibility for conjectures to be developed and tested was a more common issue (RC5).
* The evidence for the use of graphical calculators within the investigation (CT4) was generally poorly executed. If the task does not provide opportunities for the use of technology to be clearly seen it is better not to assess it.

Task design

* Investigations should provide structure and clear instructions, but also some open-ended information so that students can show individual work and are able to achieve at the highest level by placing a greater emphasis on analysis of mathematical results.
* When tasks were highly structured, students struggled to present their work in an appropriate format, resulting in limited opportunity for them to extend themselves beyond answering a series of questions.
* Encouraging the relation to real-world mathematics helps students to understand why they are doing specific calculations and the impact that it has on their results. This would also support them in being more thorough when discussing assumptions and limitations.
* Students were able to present good reports when the task provided some guidance on how to structure and write up their investigation.

Preparation and packaging of student materials

* Schools are advised to refer to [Stage 1 moderation](https://www.sace.sa.edu.au/coordinating/admin/moderation/stage-1) and information sheet‘[Preparing materials for Stage 1 moderation submission’](https://www.sace.sa.edu.au/documents/652891/704359/Preparing%2Bmaterials%2Bfor%2BStage%2B1%2Bmoderation%2Bsubmission.pdf/31814296-aa36-4875-a1ea-63604ddaff0d?t=1618901762870) on the SACE website for information on participation in Stage 1 moderation
* Teachers provided a copy of their current approved learning and assessment plan with the set of tasks that corresponded to the learning and assessment plan.
* Where schools are running multiple classes in Stage 1 Mathematics with a focus on different content, it is important to include multiple LAPs that clearly identify the assessments expected for each course so it is clear which tasks each student should have completed.

### General Comments

* Schools are continuing to make effective use of adopting or adapting tasks from the pre-approved learning and assessment plans available on the [Stage 1 Mathematics minisite.](https://www.sace.sa.edu.au/web/english-as-an-additional-language/overview)
* Teachers are encouraged to complete the online clarifying course ‘Stage 1 Mathematics’ available on PLATO. This will provide familiarisation opportunities for teachers to make assessment decisions consistent with the state-wide standards.