

Mathematical Applications

2010 ASSESSMENT REPORT

Mathematics Learning Area

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GENERAL COMMENTS

As has been the case in the past, the moderation process in 2010 was effective and efficient, both in the support moderation during the year and at final (central) moderation. The moderation panel appreciated teachers' efforts to present well-organised and complete material. The inclusion of 'solutions' is always welcome as it streamlines the task considerably. Teachers are to be commended for their cooperation in keeping to time-lines, and for their positive response to advice.

The moderation of marking standards, which is usually completed at the end of Semester 1, is designed to provide feedback to teachers based on the sample of student work submitted. To ensure that the sample is representative, teachers were asked to submit the portfolio of the highest achieving student, as well as those of the lowest achieving student in each of the A, B, C and D bands. Additional portfolios covering the middle of the A, B and C bands were also requested in case there was insufficient evidence to confirm scores, or if there were any inconsistencies that needed to be taken into account. Teachers made appropriate choices in their selection of portfolios, especially from classes where the distribution of grades was not standard.

There may have been an adjustment to student scores because of the moderation of marking standards. Where scores were adjusted downwards, this was usually because of a generous interpretation of the portfolio work against the criteria. Conversely, more complex tasks might have warranted an increase in their scores. The feedback provided by the contact moderator indicated which criteria were inappropriately applied by referring to student work samples where possible. The comments made at this stage were to inform teachers of how well their marking fitted the criteria, with a view to making suitable adjustments in marking future tasks.

At final (central) moderation, the submission of the correct portfolio is especially important so that a representative sample of student work can be considered. In 2010, it was requested that portfolios of all students who achieved a pre-moderation score of 9 be submitted in addition to the sample submitted for support moderation. This allowed the panel to examine those portfolios on the borderline of a Recorded Achievement and a Satisfactory Achievement, to determine if there was evidence of the learning outcomes being met. In a number of cases the moderation panel was able to find this evidence and move the score from a 9 to a 10.

To further assist the moderation process, the submission of a hard copy and an electronic copy of the student profile form was requested. There were a number of instances where the yellow final results sheet had not been signed by the Principal or SACE coordinator, which meant a follow-up was needed to obtain a signed copy by fax.

The panel was pleased with the appropriateness of the grades allocated; the vast majority of teacher scores were confirmed.

Comments are to be made on the green feedback sheet only if there was a change to student grades, or if a clerical error was detected. There were a number of schools where student scores were adjusted due to clerical errors, rather than changes resulting from task design or marking standards. Frequently this occurred because of the incorrect use of the

Semester 2 profile form, which required the moderated Semester 1 results to be transferred and incorporated into the final grade. Some teachers recorded the Semester 2 results only on the yellow results sheet; and other errors in transcribing and entry of results were made.

The portfolios chosen for Merit awards demonstrated outstanding, consistent achievement over each of the assessment components. The initial requirement was that of a moderated score of over 90% for each of the 6 assessment components over the full year. Where one component fell below this cut-off, the portfolio was still considered, provided that the other components were outstanding. In the portfolio tasks the panel looked for evidence of independent decision-making and individuality; brief and cogent discussion, with thoughtful reflection and clear communication were highly valued.

ASSESSMENT COMPONENT 1: SKILLS AND APPLICATIONS TASKS

Most teachers provided thorough tests which assessed all the key questions and ideas, and provided opportunities for genuine discussion and interpretation. Rarely, because of the nature of the content covered, did it become clear that tasks based on the previous Curriculum Statement were being used. It is important that teachers acquaint themselves with all the current documents pertaining to this subject, and that these requirements are reflected in assessment practices. The examination checklists are a valuable tool for constructing skills and applications tasks.

Marking of the tasks in this assessment component was well done. Many teachers provided detailed and useful feedback to students about the key concepts and their interpretation, both through their marking and comments. To reach a full range of possible achievement against the second criterion of *analysis and interpretation of results and information*, the best skills and applications tasks allowed for interpretation based on the mathematics done within the context of the problem, rather than generic questions and responses that could be drawn directly from notes. Similarly, to adequately assess the third criterion of *communication of mathematical information*, marks needed to be allocated specifically to this criterion. The correct rounding of answers, suitable labeling of graphs and diagrams, relevant application of terms, and the appropriate use of significant figures, are some of the basic aspects that might appear in a skills and applications task.

ASSESSMENT COMPONENT 2: PORTFOLIO

The panel was generally pleased with the quality of students' portfolio work. However, the assessment was the most varied of the three components. In the first criterion of *mathematical skills and understandings* it is vital that the standard of mathematics is that of a Stage 2 subject. Sometimes the expectation of the teacher was met, but there was neither sufficient depth nor complexity in the task itself to reach the maximum level of 10, using the rubric.

Generosity tended to occur most commonly when crediting evidence associated with the second criterion. To achieve the highest level of *analysis and interpretation of results and information* a student is expected to comment cogently on the mathematics, to compare and contrast results, and to provide possible reasons for outcomes. It is also anticipated that there will be some discussion on limitations and assumptions, which should relate directly to the calculations, and the context of the problem. Re-stating the results without some genuine exploration of why an outcome has occurred will not meet the full extent of this criterion.

Marks need to be allocated for the third criterion of *communication of mathematical*

information. In a portfolio task communication is more than the technical notation which might be expected in a skills and applications task. It must be clear which mathematics is selected and why, where the figures have come from, and the direction taken by the student.

Most student work was neatly presented and logically organised. To meet the fourth criterion at the highest level, the introduction should also indicate the student's understanding of the task, and outline some approaches or techniques that may be undertaken, rather than repeating the context sheet. The piece of work should be 'self-supporting' and readily understood by a person unfamiliar with the task set. To achieve a mark for *the ability to work cooperatively*, group work needs to be explicit within the body of the piece, with students not only using the information but also commenting on the processes undertaken.

To maintain the integrity of the assessment, portfolio tasks should be rotated from year to year to minimise the risk of students responding with a high degree of similarity. Decision-making and individuality is a cornerstone of the style of mathematics valued in this subject.

It was disappointing to note that too frequently portfolio tasks were not marked for the accuracy of the mathematics performed, nor comment made on the accuracy and appropriateness of the discussion and conclusion.

ASSESSMENT COMPONENT 3: EXAMINATION

Most schools chose to use last year's examination paper. It is expected that a paper at the end of its three-year cycle would be re-written or substantially altered, but because of the new, externally set examination that will be implemented in 2011, this was not a requirement. A few schools submitted a new examination paper. Teachers made sound decisions on the degree of complexity which best suited the ability of their students to demonstrate their mathematical learning and skills. Marking was done well.

Chief Assessor
Mathematical Applications