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Assessment and Reporting in Mathematics Standard Stage 6

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This document contains the NSW Education Standards Authority requirements for assessing and reporting achievement in the Year 11 and Year 12 courses for the Higher School Certificate, and provides details of the HSC examination in this course. From time to time, changes are made to HSC assessment and examination requirements. Such changes will be made available through updates to these materials. Please note that the version on the NSW Education Standards Authority website is always the current version.

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Introduction to Assessment in Stage 6

The NSW Education Standards Authority (NESA) promotes a standards-referenced approach to assessing and reporting student achievement.

Assessment is the process of gathering valid and useful information and making judgements about student achievement for a variety of purposes.

In Stage 6, those purposes include:

- assisting student learning
- evaluating and improving teaching and learning programs
- providing evidence of student achievement and course completion in Year 11 and Year 12 courses
- providing data for the end of school credential (RoSA/HSC).

Schools are required to develop an assessment program for each Year 11 and Year 12 course. NESA provides information about the responsibilities of schools in developing assessment programs in course-specific assessment and reporting requirements and in Assessment Certification Examination (ACE).

Assessment for, Assessment as, Assessment of Learning

Assessment is an essential component of the teaching and learning cycle. Assessment for, assessment as and assessment of learning are approaches that enable teachers to gather evidence and make judgements about student achievement. These are not necessarily discrete approaches and may be used individually or together and formally or informally.

Assessment is most effective when students:

- are involved in setting learning goals
- know and understand assessment criteria
- are able to monitor their own learning and reflect on their progress
- receive feedback that helps them understand how to improve their learning.

School-based Assessment in Stage 6

All teaching and learning activities are considered important for understanding course content and developing knowledge, understanding and skills in a subject. School-based assessment involves a range of informal (formative) assessment and formal (summative) assessment to provide information about student achievement of syllabus outcomes. Informal and formal assessment assists teachers to make judgements about student progress. A range of assessment activities and tasks provides opportunities for students to demonstrate achievement of syllabus outcomes in different ways.

Informal assessment

Teachers use informal assessment opportunities throughout the teaching and learning cycle to gather evidence about how students learn and what they know. Informal assessment includes activities undertaken and anecdotal evidence gathered throughout the teaching and learning process in a less prescribed manner than formal assessment.

These activities provide evidence for teachers and inform feedback to students in relation to improving their learning. Informal assessment may include a range of strategies such as questioning, class discussion, observations and student self-evaluation.

Formal assessment

Formal school-based assessment provides opportunities to gather evidence about student achievement of syllabus outcomes in different ways to the HSC examinations. Formal assessment tasks are those which students undertake as part of the school-based assessment program, reflecting specific course requirements, components and weightings.

A formal written examination is defined as a task such as a half yearly, yearly or trial HSC examination. It is undertaken individually, under supervised examination conditions and includes one or more unseen questions or items. A formal written examination is used to gather evidence about student achievement of a range of syllabus outcomes, at a point in time.

Evidence gathered through formal assessment assists teachers to report on student achievement in relation to syllabus outcomes and standards at a point in time, and is often used for grading or ranking purposes. The components and weightings and the prescribed nature of some tasks ensure a common focus for school-based assessment in a course across schools, while also allowing for flexibility in the design of some tasks at the school level.

Year 11 Mathematics Standard School-based Assessment Requirements

The components and weightings for Year 11 are mandatory.

Component	Weighting %
Understanding, fluency and communication	50
Problem solving, reasoning and justification	50
	100

The Year 11 formal school-based assessment program is to reflect the following requirements:

- three assessment tasks
- the minimum weighting for an individual task is 20%
- the maximum weighting for an individual task is 40%
- one task must be an assignment or investigation-style with a weighting of 20–30%.

Information about the assignment or investigation-style task in Mathematics Standard

The length and scheduling of the assignment or investigation-style task is at the discretion of the school. The task should provide opportunities to gather evidence about the:

- achievement of a range of outcomes
- application of Working Mathematically components
- demonstration of knowledge and skills in different ways to the HSC examinations.

The task provides application and modelling opportunities.

Outcomes that are content specific should be assessed and should include the following:

MS11–9: uses appropriate technology to investigate, organise and interpret information in a range of contexts

MS11–10: justifies a response to a given problem using appropriate mathematical terminology and/or calculations

The following examples provide some approaches to task types:

- an investigative project or assignment involving presentation of work in class
- an independently chosen project or investigation
- scaffolded learning tasks culminating in an open-ended or modelling style problem
- a guided investigation or research task involving collection of data and analysis.

Year 12 Mathematics Standard School-based Assessment Requirements

(including Year 12 Mathematics Standard 1 and Year 12 Mathematics Standard 2)

NESA requires schools to submit a school-based assessment mark for each Year 12 candidate in a course. Formal school-based assessment tasks are based on course requirements and components and weightings that contribute to the determination of the final mark for a course. The mark submitted by the school provides a summation of each student's achievement measured at several points throughout the course.

The marks submitted for each course group at a school should reflect the rank order of students, and must be on a scale sufficiently wide to reflect adequately the relative differences in student performances. The actual mark should not be revealed to students as it is subject to moderation and may become confusing for students when they receive their results. Students must be informed that they can obtain their Assessment Rank Order Notice from Students Online after the last HSC examination at their centre and within the period of time for appeals.

The school-based assessment marks submitted to NESA for Year 12 must not include measures of outcomes that address values and attitudes or reflect student conduct. Schools may decide to report on these separately to students and parents.

The collection of information for the Year 12 school-based assessment mark must not begin before the completion of the Year 11 course.

The components and weightings for Year 12 are mandatory.

Component	Weighting %
Understanding, fluency and communication	50
Problem solving, reasoning and justification	50
	100

The Year 12 formal school-based assessment program is to reflect the following requirements:

- a maximum of four assessment tasks
- the minimum weighting for an individual task is 10%
- the maximum weighting for an individual task is 40%
- one task may be a formal written examination with a maximum weighting of 30%
- one task must be an assignment or investigation-style with a weighting of 15–30%.

Information about the assignment or investigation-style task in Mathematics Standard

The length and scheduling of the assignment or investigation-style task is at the discretion of the school. The task should provide opportunities to gather evidence about the:

- achievement of a range of outcomes
- application of Working Mathematically components
- demonstration of knowledge and skills in different ways to the HSC examinations.

The task provides application and modelling opportunities.

Outcomes that are content specific should be assessed and should include the following:

Mathematics Standard 1

MS1–12–9: chooses and uses appropriate technology effectively and recognises appropriate times for such use

MS1–12–10: uses mathematical argument and reasoning to evaluate conclusions, communicating a position clearly to others

Mathematics Standard 2

MS2–12–9: chooses and uses appropriate technology effectively in a range of contexts, and applies critical thinking to recognise appropriate times and methods for such use

MS2–12–10: uses mathematical argument and reasoning to evaluate conclusions, communicating a position clearly to others and justifying a response

The following examples provide some approaches to task types:

- an investigative project or assignment involving presentation of work in class
- an independently chosen project or investigation
- scaffolded learning tasks culminating in an open-ended or modelling style problem
- a guided investigation or research task involving collection of data and analysis.

HSC Examination Specifications

The external HSC examination measures student achievement in a range of syllabus outcomes.

The external examination and its marking relate to the syllabus by:

- providing clear links to syllabus outcomes
- enabling students to demonstrate the levels of achievement outlined in the performance band descriptions
- applying marking guidelines based on criteria that relate to the quality of the response
- aligning performance in the examination each year to the standards established for the course.

Students studying Mathematics Standard 1 may elect to undertake an optional HSC examination. The examination mark may be used by the Universities Admissions Centre (UAC) to contribute to the student's Australian Tertiary Admission Rank (ATAR).

All students studying Mathematics Standard 2 will sit for an HSC examination.

Examination specifications for Mathematics Standard 1 and Mathematics Standard 2 will be available in Term 3 2017.

Adjustments to Assessment for Students with Special Education Needs

It is a requirement under the *Disability Standards for Education 2005* for schools to ensure that students with special education needs can access and participate in education on the same basis as other students.

Some students with special education needs will require adjustments to assessment practices in order to demonstrate what they know and can do in relation to syllabus outcomes and content.

These may include:

- adjustments to the assessment process. Some examples include additional time, rest breaks, the use of a reader and/or scribe or specific technology
- adjustments to assessment activities. Some examples include rephrasing questions, using simplified language or alternative formats for questions
- alternative formats for responses. Some examples include writing in point form instead of essays, scaffolded structured responses, short objective questions or multimedia presentations.

Schools are responsible for any decisions about adjustments to course work and formal school-based assessment tasks throughout Year 11 and Year 12. To access adjustments for the HSC examinations, an application for Disability Provisions must be submitted to NESA. Providing adjustment does not restrict a student's access to the full range of grades or marks.

Examples of adjustments to assessment for students with special education needs can be found in course support materials. Additional advice is available on the NESA website.

Mathematics Life Skills

Students undertaking the Mathematics Life Skills course will study selected outcomes and content informed by a collaborative curriculum planning process. Assessment should provide opportunities for students to apply their knowledge, understanding and skills to a range of situations or environments. Students undertaking Life Skills courses are not required to complete formal assessment tasks. Teachers are best able to determine the progress of the student.

Students may demonstrate achievement in relation to Mathematics Life Skills outcomes independently; with adjustments or with support. The type of adjustments and support will vary according to the particular needs of the student and the requirements of the activity.

Additional information about Life Skills eligibility, programming, planning and assessment is available on the NESAs website.

Reporting in Stage 6

Year 11

Schools are responsible for awarding a grade for each student who completes a Year 11 course (except Life Skills and VET courses) to represent their achievement. These grades are determined by the student's performance against the common grade scale. Teachers make professional on-balance judgements about which grade description best matches the standards their students have demonstrated or achieved.

Teachers follow a process of moderation to ensure that grades awarded are consistent with published standards. This means that the grade a student receives in one school can be compared to the same grade anywhere in NSW. Teachers moderate their judgements by comparing work samples for their students with samples aligned to the A to E grades. The grade is reported on the student's Record of Student Achievement (RoSA), a cumulative credential that allows students to accumulate their academic results until they leave school.

Year 12

The use of both school-based assessment and external examinations of student achievement allows measurements and observations to be made at several points and in different ways throughout the Year 12 course. Taken together, the external examination and school-based assessment provide a valid and reliable assessment of the achievement of the knowledge, understanding and skills described for each course.

Students who leave school prior to the HSC examinations will be able to receive their RoSA. It will record grades for their completed Stage 5 courses and any participation in Stage 6 courses.

The Higher School Certificate credentials received by students are used by NESA to report both the school-based and examination measures of achievement.

Typically, HSC results comprise:

- **an assessment mark** derived from the mark submitted by the school and produced in accordance with NESA requirements for the school-based assessment program
- **an examination mark** derived from the HSC external examination
- **an HSC mark**, which is the average of the assessment mark and the examination mark
- **a performance band**, determined by the HSC mark.

For the HSC, student performance in a Year 12 course is reported against standards on a course report.

The course report contains:

- a level of achievement for the performance band descriptors
- an HSC mark located on the performance scale
- a school-based assessment mark
- an examination mark.

The course report also shows graphically the state-wide distribution of HSC marks of all students in the course. The distribution of marks is determined by students' performances against the standards and not scaled to a predetermined pattern of marks.