Mathematics, Mathematics Extension 1 and Mathematics Extension 2 Stage 6

Draft Writing Brief

October 2015

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Published by:
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DSSP-26233

D2015/76464

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1. Introduction

In 2014, the Board of Studies, Teaching and Educational Standards NSW (BOSTES) commenced a review of NSW senior secondary syllabuses for English, Mathematics, Science and History learning areas to determine directions for the incorporation of senior secondary Australian curriculum. BOSTES conducted consultation in August and September 2014 on proposed directions outlined in the *NSW Senior Secondary Review & Evaluation: English, Mathematics, Science and History* document.

The broad directions for each learning area, developed following consultation, were endorsed by BOSTES in December 2014 and are available in Section 2 of this Draft Writing Brief.

The development of the *Mathematics, Mathematics Extension 1 and Mathematics Extension 2 Stage 6 Draft Writing Brief* takes account of the broad directions.

The Draft Writing Brief:

- proposes the nature and number of courses within each learning area
- proposes options for course structures
- provides information about how Australian curriculum content may be modified, reordered and supplemented for inclusion in the draft syllabus.

Following consultation on the Draft Writing Brief, a Consultation Report, detailing feedback received and the key matters arising from consultation will be published. The BOSTES endorsed final Writing Brief will inform the directions for draft syllabus development.

The draft syllabuses for Mathematics, Mathematics Extension 1 and Mathematics Extension 2 Stage 6 will be available for consultation during 2016. It will include the elements of a syllabus and Australian curriculum content identified with codes, learning across the curriculum content identified by icons, further information about meeting the diversity of learners, and internal and external assessment.

A summary of the BOSTES syllabus development process is available at http://www.boardofstudies.nsw.edu.au/syllabuses/syllabus-development/.

Diversity of learners

NSW senior secondary syllabuses will be inclusive of the learning needs of all students. The draft syllabuses will be designed to accommodate teaching approaches that support student diversity under the sections ‘Students with special education needs’, ‘Gifted and talented students’ and ‘Students learning English as an additional language or dialect (EAL/D)’.

For example:

Special education needs

All students with special education needs are entitled to participate in and progress through the curriculum. Some students may require additional support or adjustments to teaching, learning and assessment activities. Adjustments are measures or actions taken

in relation to teaching, learning and assessment that enable a student to access syllabus outcomes and content and demonstrate achievement of outcomes.

Most students with special education needs will undertake regular Board Developed courses and/or Board Endorsed courses. Students with special education needs can access Years 11 and 12 outcomes and content in a range of ways. They should choose the most appropriate courses for the HSC in keeping with their goals, interests and learning needs.

Students may engage with:

- syllabus outcomes and content with adjustments to teaching, learning and/or assessment activities
- selected outcomes and content appropriate to their learning needs
- selected Years 11–12 Life Skills outcomes and content appropriate to their learning needs.

Related Life Skills outcomes and content will be included and will align with the Years 11 and 12 content in the Mathematics General 1 Stage 6 Draft Syllabus.

2. Broad directions

The following broad directions for syllabus development have been informed through consultation with stakeholders. These broad directions will guide the development of the NSW Mathematics Stage 6 syllabuses.

1. In the revision of the courses, consideration be given to how the courses provide flexibility to meet the needs of all students.
2. The content prescribed for each of the revised courses:
    a. be carefully monitored to reflect the indicative time of the course. In the case of the revised Mathematics General courses and the revised Mathematics (‘2 Unit’) course, there should be a net reduction in content when compared to the respective current courses
    b. be reviewed for relevance and opportunities for depth of learning.
3. The status of the revised Mathematics General 1 course be reviewed and consideration be given to:
    a. making the course a Board Developed course with an optional HSC examination
    b. developing a separate Preliminary course for the revised Mathematics General 1 course.
4. The nested structure of the current Mathematics ('2 Unit'), Mathematics Extension 1 and Mathematics Extension 2 courses be retained for the respective revised courses.
5. The inclusion of additional study of statistics be considered, while addressing implications in relation to the extent of relevant teacher expertise, professional development, future pathways of students, school mathematics staffing, and school timetabling.
6. In reviewing the content of the calculus-based courses, the appropriateness and relevance of the applications within the courses be explored, with a view to ensuring that they are contemporary and meet the needs of students.
7. The technology available for use by candidates in the mathematics HSC examinations be clarified in the development of the Draft Writing Briefs.
8. The appropriateness of the current structures and durations of the HSC examinations for the senior mathematics courses be reviewed, with particular emphasis on the examination of '2 Unit'-only candidates.
9. An appropriate Formula sheet be provided for each HSC mathematics examination.
10. In the development of course structures and HSC examinations for the revised Mathematics (‘2 Unit’) and Mathematics General 2 courses, consideration be given to student movement between the courses and the need to make meaningful comparisons of student performance.
11. The rationale, outcomes and content of the Mathematics Life Skills course be reviewed to better meet the needs of the students for whom the course is intended, as well as to provide an appropriate progression from Mathematics Life Skills Stage 5 outcomes and content and alignment with the regular mathematics Stage 6 courses where appropriate.
12. In the naming of the revised mathematics Stage 6 courses, consideration be given to the nomenclature used for English Stage 6 courses.

Australian curriculum

BOSTES began its syllabus development process for Stage 6 English, Mathematics, Science and History in 2014. This follows state and territory education Ministers' endorsement of senior secondary Australian curriculum in these learning areas as the agreed and common base for development of state and territory senior secondary courses. It was also agreed that states and territories would have the flexibility to integrate the approved senior secondary Australian curriculum as appropriate. The development of Draft Writing Briefs will determine how Australian curriculum content can be modified, reordered and supplemented in each learning area, while remaining compatible with the NSW senior years assessment and examinations structures.

3. Rationale

ⓘ for your information

The rationale describes the distinctive nature of the subject and outlines its relationship to the contemporary world and current practice. It explains the place and purpose of the subject in the curriculum:

- why the subject exists
- what the theoretical underpinnings are
- what makes the subject distinctive
- why students would study the subject
- how it contributes to the purpose of the Stage 6 curriculum.

✍ consult

Proposed rationale for Mathematics, Extension 1 and Extension 2 Stage 6

Mathematics is deeply embedded in modern society. From the numeracy skills required to manage personal finances, to devices and scales for measuring something of interest, to leading-edge technologies in the sciences and engineering, Mathematics provides the framework for interpreting, analysing and predicting, and the tools for effective participation in an increasingly complex society.

The need to interpret the large volumes of data made available through technology draws on skills in logical thought and skills in checking claims and assumptions in a systematic way. Mathematics is the appropriate training ground for the development of these skills. The thinking required to further enhance the power and usefulness of technology in real-world applications requires advanced mathematical training. The rapid advances in technology experienced in recent years have driven, and have been driven by, advances in the discipline of Mathematics.

The development of Mathematics throughout history has been catalysed by its utility in explaining real-world phenomena and its inherent beauty. In this way, the discipline has continued to evolve through a process of observation, conjecture, proof and application.

The Mathematics, Mathematics Extension 1 and Mathematics Extension 2 courses form a continuum to provide opportunities at progressively higher levels for students to acquire knowledge, skills and understanding in relation to important concepts within areas of Mathematics that have applications in an increasing number of contexts. These concepts and applications are appropriate to the students' continued experience of Mathematics as a coherent, interrelated, interesting and intrinsically valuable study that forms a basis for future learning.

Students develop an appreciation of Mathematics as a study with high levels of internal structure that provide opportunities for the development of logical and disciplined thought. Through the learning experiences within the courses, students are able to progress from a knowledge and understanding of facts, procedures and applications in idealised contexts to facility in the use of mathematical models that situate the Mathematics in context, and to more advanced generalisations based on deductive and inductive reasoning processes.

This involves the development and use of an increasingly sophisticated level of communication and literacy.

The concept of a function of a real variable, the algebraic and geometrical representations of a number of important functions, and the introductory concepts and techniques of differential and integral calculus, together form a strong basis of the courses. These concepts, representations and techniques are developed and utilised across the courses.

The Differential Calculus is concerned with how quantities change and is of fundamental importance in Mathematics. It builds on knowledge, skills and understanding developed earlier in algebra, geometry and trigonometry. The concepts and techniques of calculus provide a means of modelling and developing increased understanding of many real-world situations, and of solving a variety of related problems. These situations and problems include many of those arising in the sciences, including in relation to the natural environment and medicine, and in statistics, business, finance and economics. A number of related applications are studied in the Mathematics, Mathematics Extension 1 and Mathematics Extension 2 courses.

The Mathematics course has been written on the assumption that students have demonstrated competence in Mathematics up to and including the Stage 5.2 level by the end of Year 10. The course provides such students with the opportunity to develop an understanding of and competence in further aspects of Mathematics through real-world applications for concurrent HSC studies, such as in science, business studies and economics, and for further studies at tertiary level in such areas as the life sciences, business, finance, technology and education. At the same time, the Mathematics course provides an appropriate basis for the study of the Mathematics Extension Stage 6 courses.

The Mathematics Extension 1 course has been written to meet the needs of students who have demonstrated a high level of competence in Mathematics up to and including the Stage 5.3 level by the end of Year 10. The course provides such students with the opportunity to develop a thorough understanding of and competence in further aspects of Mathematics through real-world applications for concurrent HSC studies, such as in science, engineering studies and economics, and for further studies at tertiary level in Mathematics, and in such areas as the physical sciences and engineering.

At the same time, the Mathematics Extension 1 course, together with the Mathematics course, provides an appropriate basis for the study of the Mathematics Extension 2 course, which has been written to meet the needs of students who have demonstrated outstanding ability in Mathematics. The course represents a distinctly high level in school mathematics and provides such students with the opportunity to develop considerable manipulative skills and a high degree of understanding of the fundamental ideas of algebra and calculus. The course, therefore, provides a sufficient basis for a wide range of useful applications of Mathematics as well as a strong foundation for the further study of the subject.

4. Aim

ⓘ for your information

In NSW syllabuses, the aim provides a succinct statement of the overall purpose of the syllabus. It indicates the general educational benefits for students from programs based on the syllabus.

The aim, objectives, outcomes and content of a syllabus are clearly linked.

✍ consult

Proposed aim for Mathematics, Extension 1 and Extension 2 Stage 6

The calculus-based Mathematics, Mathematics Extension 1 and Mathematics Extension 2 courses are designed to promote at progressively higher levels the development of knowledge, skills and understanding in relation to important concepts within areas of Mathematics that have applications in an increasing number of contexts. Across the three courses, this includes the development of deductive and inductive reasoning skills, the ability to interpret and use mathematical models, and the ability to make more and more advanced generalisations, with increasing levels of communication and literacy.

Students will learn to use a range of techniques and tools, including appropriate technologies, in order to develop solutions to a wide variety of problems relating to their present and future needs and aspirations.

5. Objectives

ⓘ for your information

In NSW syllabuses, objectives provide specific statements of the intention of a syllabus. They amplify the aim and provide direction to teachers on the teaching and learning process emerging from the syllabus. They define, in broad terms, the knowledge, understanding, skills, values and attitudes to be developed through study in the subject. They act as organisers for the intended outcomes.

✍ consult

Proposed objectives for Mathematics, Extension 1 and Extension 2 Stage 6

Knowledge, skills and understanding

Students:

- apply deductive reasoning, and use appropriate language, in the construction of mathematical arguments and proofs
- use concepts and techniques, including technology, in the solution of problems
- interpret and use mathematical models in a range of contexts
- analyse solutions to problems and conclusions, and communicate in appropriate mathematical forms.

Values and attitudes

Students:

- appreciate the scope, usefulness, power and elegance of mathematics.

6. Outcomes

ⓘ for your information

In NSW syllabuses, outcomes provide detail about what students are expected to achieve at the end of each Stage in relation to the objectives. They indicate the knowledge, understanding and skills expected to be gained by most students as a result of effective teaching and learning. They are derived from the objectives of the syllabus.

✍ consult

Proposed outcomes for Mathematics, Extension 1 and Extension 2 Stage 6

Up to 10 outcomes will be developed for each year. The following table presents a sample of some of the proposed outcomes.

Objectives	**Preliminary Mathematics outcomes**	**HSC Mathematics outcomes**	**Preliminary Mathematics Extension outcomes**	**HSC Mathematics Extension 1 outcomes**	**HSC Mathematics Extension 2 outcomes**
Students:	A student:	A student:	A student:	A student:	A student:
apply deductive reasoning, and use appropriate language, in the construction of mathematical arguments and proofs	MAP–1 provides reasoning to support conclusions appropriate to the context	MAH–1 constructs mathematical arguments to prove and justify results	MX1P–1 uses deductive reasoning to solve problems and prove results in circle geometry MX1P–2 uses algebraic techniques to solve inequalities and prove results and identities	MX1H–1 uses mathematical induction in the construction of proofs MX1H–2 uses the binomial theorem and algebraic and calculus techniques to prove identities	MX2H–1 constructs mathematical arguments and proofs in concrete and abstract settings MX2H–2 applies algebraic, graphical and calculus techniques in the construction of proofs, including those involving inequalities
use concepts and techniques, including technology, in the solution of problems	MAP–2 performs routine arithmetic and algebraic manipulation involving surds, simple rational expressions, absolute values and logarithms	MAH–2 manipulates algebraic expressions and solves problems involving exponential and logarithmic functions	MX1P–3 uses the relationship between the algebraic and geometrical representations of a function in the solution of problems	MX1H–3 uses the concept of inverse functions in the solution of problems	MX2H–3 combines the ideas of algebra and calculus to determine features of graphs

This example illustrates the organisation under common objectives for Preliminary and HSC years. Some objectives may not be common.

7. Course structure and options

ⓘ for your information

The following provides an outline of some proposed Preliminary and HSC course structures for the Mathematics, Mathematics Extension 1 and Mathematics Extension 2 Stage 6 syllabuses with indicative course hours and the arrangement of course content, along with outlining relationships between specific components and between core and options.

✍ consult

Proposed options for course structure for Mathematics, Extension 1 and Extension 2 Stage 6

It is envisaged that the ‘nested’ structure of the Mathematics and Extension courses will be retained.

However, it is proposed within the options that there be a structural change in the Mathematics course. The consultation process will provide opportunity to comment on the proposed structure and to inform the final structure.

Matters for consideration

Option 1 – changes to examination structures and BDC/CEC status of current HSC Mathematics General 1 course

Proposed Preliminary courses	Changes to current course structure	Change of BDC/CEC status?	Likely extent/nature of content revision	
Preliminary Mathematics General (BDC) (common Preliminary course for HSC Mathematics General 2 and HSC Mathematics General 1)	Nil	No	Minor*	
Preliminary Mathematics (BDC) (currently 'Preliminary Mathematics ('2 Unit')')		No	Major	
Preliminary Mathematics Extension (BDC)		No	Major	
Proposed HSC courses	**Changes to current course structure**	**Change of BDC/CEC status?**	**Likely extent/nature of content revision**	**Proposed revised examination specifications**
HSC Mathematics General 2 (BDC)	Nil	No	Minor*	
HSC Mathematics General 1 (BDC) (currently HSC Mathematics General 1 (CEC))		Yes	Minor*	Optional HSC examination
HSC Mathematics (BDC) (currently HSC Mathematics ('2 Unit'))		No	Major	The last two examination questions (approx 30 marks) will be chosen according to whether a student is a Mathematics or Extension 1 candidate ^
HSC Mathematics Extension 1 (BDC)		No	Major	
HSC Mathematics Extension 2 (BDC)		No	Major	

* A greater level of revision would be considered, if required, to align with agreed changes to the Mathematics ('2 Unit') course.

^ The two questions for Extension 1 students at the end of the paper would be similar in nature and difficulty to questions at the end of the current Mathematics ('2 Unit') paper, while the two questions for Mathematics students at the end of the paper would be more routine in nature and, therefore, less difficult than those for Extension 1 students.

Option 2 – changes to both course and examination structures and BDC/CEC status of current HSC Mathematics General 1 course

Proposed Preliminary courses	Changes to current course structure	Change of BDC/CEC status?	Likely extent/nature of content revision
Preliminary Mathematics General 2 (BDC) (revised Preliminary Mathematics General)	Separate Preliminary courses replace (common) Preliminary Mathematics General course	No	Moderate revision. The course will have significant overlap with the Mathematics course to assist student movement and to obtain appropriate course relativity in ATAR scaling. Overlap would include rates of change (without getting to the stage of formally calculating derivatives) for stronger tertiary preparation.
Preliminary Mathematics General 1 (BDC) (revised Preliminary Mathematics General)		No	A new course that will build on student knowledge and skills from Stage 5.1.
Preliminary Mathematics (BDC) (currently 'Preliminary Mathematics ('2 Unit')')	No	No	Major revision, including revision of content to provide closer links between concept formation, practice and application/modelling. The course will have significant overlap with the Mathematics General 2 course to assist student movement and to obtain appropriate course relativity in ATAR scaling.
Preliminary Mathematics Extension (BDC)	No	No	Major revision.

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Proposed HSC courses	Changes to current course structure	Change of BDC/CEC status?	Nature of content revision	Proposed revised examination specifications
HSC Mathematics General 2 (BDC)	No	No	Moderate revision. The course will have significant overlap with the Mathematics course to assist student movement and to obtain appropriate course relativity in ATAR scaling. Overlap would include rates of change (without getting to the stage of formally calculating derivatives) for stronger tertiary preparation.	The examination will have some questions in common with the Mathematics examination so UAC can obtain appropriate course relativity in ATAR scaling.
HSC Mathematics General 1 (BDC) (currently HSC Mathematics General 1 (CEC))	No	Yes	Moderate revision. New course will build on student knowledge and skills from Stage 5.1.	Optional HSC examination
HSC Mathematics (BDC) (currently HSC Mathematics ('2 Unit'))	No	No	Major revision, including revision of content, to provide closer links between concept formation, practice and application/modelling. The course will have significant overlap with the Mathematics General 2 course, as above.	The examination will have some questions in common with the Mathematics General 2 examination, as above. The last two examination questions (approx 30 marks) will be chosen according to whether a student is a Mathematics or Extension 1 candidate^
HSC Mathematics Extension 1 (BDC)	No	No	Major revision	
HSC Mathematics Extension 2 (BDC)	No	No	Major revision	

^ The two questions for Extension 1 students at the end of the paper would be similar in nature and difficulty to questions at the end of the current Mathematics ('2 Unit') paper, while the two questions for Mathematics students at the end of the paper would be more routine in nature and, therefore, less difficult than those for Extension 1 students.

Course content

Mathematics Advanced

Proposed course topics:

- Real numbers and algebraic techniques (surds and indices, algebraic expressions, equations and inequalities, logarithms)
- Real functions and their graphs (simple graphs, function notation, properties of functions and graphs, regions and inequalities, applications involving real functions: direct and inverse variation, constructing and using functions)
- Trigonometry (exact ratios, sine rule, cosine rule, area rule, angles of any magnitude, identities, equations, graphs, trigonometric functions, derivatives of trigonometric functions, applications of the calculus of trigonometric functions)
- Differential calculus (estimating change, the derivative function, differentiation, Euler's number and natural logarithms, stationary points, the second derivative, curve sketching, maximising and minimising)
- Integral calculus (the primitive function, the definite integral, approximating definite integrals, applications of integration)
- Sequences and series (applications of series to finance: present and future value, annuities)
- Descriptive statistics (univariate and bivariate data, the normal distribution, lines of best fit)
- Probability (systematic counting of events, successive outcomes, tree diagrams, applications involving probability and finance: counting techniques and probability, investment, reducing-balance loans)
- Exponential and logarithmic functions (calculus of exponential and logarithmic functions, applications to the natural environment: rates of change of physical quantities, exponential growth and decay).

This encompasses material from a range of topics from the Australian senior secondary curriculum subjects General Mathematics and Mathematical Methods, including:

General Mathematics: Univariate data analysis and the statistical investigation process; Applications of trigonometry; Linear equations and their graphs; Bivariate data analysis; Growth and decay in sequences; Loans, investments and annuities

Mathematical Methods: Functions and graphs; Trigonometric functions; Counting and probability; Exponential functions; Arithmetic and geometric sequences and series; Introduction to differential calculus; Further differentiation and applications; Integrals; Discrete random variables; The logarithmic function; Continuous random variables and the normal distribution; Interval estimates for proportions.

Mathematics Extension 1 (includes Preliminary Mathematics Extension)

Proposed course topics:

- Circle geometry
- Further algebra (general theory of quadratic equations, quadratic and cubic expressions and equations)
- Polynomials (polynomial functions and their graphs, the remainder and factor theorems)
- Transformations of graphs
- Further trigonometry (sums and differences, trigonometry in three dimensions, solution and applications of trigonometric equations, further calculus of trigonometric functions)
- Series, elementary difference equations (limiting sum of a geometric series, methods of solution of first-order linear difference equations)
- Descriptive statistics (discrete random variables, continuous random variables, types of distributions)
- Mathematical induction
- The binomial theorem (binomial expansions and identities, binomial probabilities)
- Methods and applications of integration (including substitution, solids of revolution)
- Inverse functions (including inverse trigonometric functions)
- Further applications of calculus involving mathematical modelling (including further exponential growth and decay, related rates, projectile motion, iterative methods for estimating roots of equations).

This encompasses material from a range of topics from the Australian senior secondary curriculum subjects Mathematical Methods and Specialist Mathematics, including:

Mathematical Methods: Functions and graphs, Trigonometric functions, Arithmetic and geometric sequences and series, Further differentiation and applications, Discrete random variables, Continuous random variables and the normal distribution, Interval estimates for proportions

Specialist Mathematics: Geometry, Trigonometry, Real and complex numbers, Functions and sketching graphs, Integration and applications of integration, Rates of change and differential equations.

Mathematics Extension 2

Proposed course topics:

- The nature of proof (including proofs involving inequalities)
- Complex numbers and polynomials over the complex field (arithmetic of complex numbers, geometric representation, powers and roots, curves and regions, fundamental theorem of algebra and factorising polynomials)
- Graphs (graphing techniques, general approach to curve sketching)
- Integration techniques (including integration by parts, recurrence relations)
- Volumes (by slicing, by the method of cylindrical shells)
- Modelling with functions and derivatives (solving differential equations by integration, first-order linear differential equations)
- Mechanics (simple harmonic motion, Newton's laws, resisted motion along a horizontal line, resisted motion under gravity)
- Difference equations (solving second-order difference equations, the logistic growth equation, equilibrium, periodic and chaotic solutions)
- Statisical inference (sample means, confidence intervals for means).

This encompasses material from a range of topics from the Australian senior secondary curriculum subject Specialist Mathematics, including:

Geometry, Trigonometry, Real and complex numbers, Functions and sketching graphs, Integration and applications of integration, Rates of change and differential equations.

Use of technology

(a) In learning and teaching, and school-based assessment

The appropriateness, viability and level of use of different types of technology in the learning and teaching of courses within the Mathematics key learning area are decisions for students, teachers and schools.

The final syllabuses will provide a range of opportunities for the use of contemporary mathematics technologies. This will include opportunities to utilise various types of calculators (including those that perform algebraic calculations), a wide variety of software packages, and apps for graphing functions, performing measurement, financial and statistical calculations and explorations. Sophisticated applications such as Wolfram Alpha provide opportunities for students to analyse answers and to backward-map in obtaining solutions to problems.

(b) In the HSC examinations

It has been previously agreed that the technology available for use by candidates in Mathematics HSC examinations be clarified in relevant Draft Writing Briefs. Accordingly, it is proposed that in HSC examinations for these courses, candidates be permitted to use only devices manufactured to meet a clear set of Board-prescribed functions and capabilities. These functions and capabilities will be consistent with and support the knowledge and skills that students should be able to demonstrate after completing the Mathematics, Mathematics Extension 1 and Mathematics Extension 2 courses. For this reason, the functions and capabilities will be determined in parallel with the development of the content for the courses in the Syllabus Development Phase.

Naming the courses

In the revision of the suite of Mathematics Stage 6 courses, it is proposed that the nomenclature for the English Stage 6 courses[1] be used in the naming of the courses.

[1] Mathematics General 1 → Mathematics Studies

Mathematics General 2 → Mathematics Standard

Mathematics ('2 Unit') → Mathematics Advanced

Mathematics Extension 1 → Mathematics Extension 1

Mathematics Extension 2 → Mathematics Extension 2

8. Learning across the curriculum

ⓘ for your information

NSW syllabuses provide a context within which to develop core skills, knowledge and understanding considered essential for the acquisition of effective, higher-order thinking skills that underpin successful participation in further education, work and everyday life including problem-solving, collaboration, self-management, communication and information technology skills.

BOSTES has described learning across the curriculum areas that are to be included in syllabuses. In Stage 6 syllabuses, the identified areas will be embedded in the descriptions of content and identified by icons. Learning across the curriculum content, including the cross-curriculum priorities and general capabilities, assists students to achieve the broad learning outcomes defined in the BOSTES *Statement of Equity Principles,* the *Melbourne Declaration on Educational Goals for Young Australians (December 2008)* and in the Australian Government's *Core Skills for Work Developmental Framework* (2013).

Knowledge, understanding, skills, values and attitudes derived from the learning across the curriculum areas will be included in BOSTES syllabuses, while ensuring that subject integrity is maintained.

Cross-curriculum priorities enable students to develop understanding about and address the contemporary issues they face.

The cross-curriculum priorities are:

- Aboriginal and Torres Strait Islander histories and cultures
- Asia and Australia's engagement with Asia
- Sustainability

General capabilities encompass the knowledge, skills, attitudes and behaviours to assist students to live and work successfully in the 21st century.

The general capabilities are:

- Critical and creative thinking
- Ethical understanding
- Information and communication technology capability
- Intercultural understanding
- Literacy
- Numeracy
- Personal and social capability

BOSTES' syllabuses include other areas identified as important learning for all students:

- Civics and citizenship
- Difference and diversity
- Work and enterprise

9. Glossary

ⓘ for your information

A glossary will be developed for the draft Mathematics, Extension 1 and Extension 2 Stage 6 syllabuses which explains terms that will assist teachers in the interpretation of the subject.

10. Assessment and reporting

BOSTES continues to promote a standards-referenced approach to assessing and reporting student achievement in NSW, and the importance of assessment for, of and as learning as essential components of quality teaching and learning.

Information on assessment and reporting for Preliminary and HSC courses will be developed for the draft syllabus consultation in 2016.

The information will include:

- suggested components and weightings for school-based assessment of the Preliminary course
- mandatory components and weightings for school-based assessment of the HSC course
- HSC examination specifications which describe the format of the HSC examination program for Mathematics, Mathematics Extension 1 and Mathematics Extension 2.

Advice about assessment in relation to the Mathematics, Mathematics Extension 1 and Mathematics Extension 2 syllabuses is contained in *Assessment and Reporting in Mathematics, Extension 1 and Extension 2 Stage 6*. This document provides general advice on assessment in Stage 6 as well as the specific requirements for the Preliminary and HSC courses.

Consultation on assessment and reporting during the Draft Writing Brief phase will focus on providing feedback about assessment and reporting practices in schools, school-based assessment requirements, the use of technology in assessment, and external assessment programs.