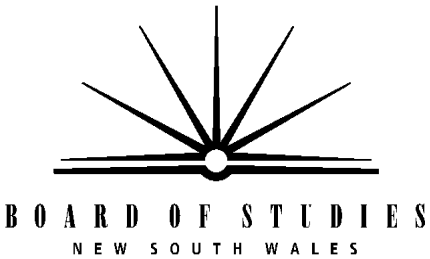

Mathematics
Years K–10 Draft Australian Curriculum

Consultation Report

Published by Board of Studies NSW
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Sydney 2001
Australia

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1 Executive Summary

1.1 Introduction

The majority of the content prescribed in the Australian K–10 mathematics curriculum is similar to that of the NSW K–10 mathematics curriculum. The current draft of the curriculum, however, lacks the continuity and coherence of the NSW curriculum and has inconsistent levels of expectation for students across the Years. It is not apparent that its Year-by-Year structure provides appropriate flexibility to cater for the range of student learning needs.

It is not apparent in the current draft of the curriculum that the aim of allowing more time for students to study fewer topics in greater depth, through a reduction in the breadth of content, has been achieved. Teachers have indicated that they believe the content descriptions lack sufficient detail for consistent treatment across schools.

A range of issues have been identified in relation to the appropriate sequencing of the curriculum content. These include concerns regarding ordering of content and inappropriate 'gaps' in teaching sequences. Respondents were of the view that it is essential that a clear 'scope and continuum' needs to be developed for both the assistance of teachers and to help ensure the continuity and coherence of the final curriculum materials.

Respondents were of the view that the curriculum, including the content specified for Year 10A, is not of sufficient scope to prepare high-achieving students for high levels of senior mathematics. Teachers are also concerned that the Year-by-Year structure of the curriculum could lead to more able students not being introduced to more demanding content early enough, ie in Years 7, 8 and 9. Also, many Years 9 and 10 students will not have achieved the level of mathematics that will allow them to access the Years 9 and 10 curriculum.

Respondents were very strongly of the view throughout the consultation that extensive professional development will be required for effective implementation and delivery of the curriculum. It was suggested that high levels of professional development will be required regarding the Number and Algebra strand in particular for K–6 teachers, and regarding the Statistics and Probability strand for teachers across K–10.

1.2 Key matters

- The Year-by-Year structure of the curriculum creates the unrealistic expectation that all content will be taught to all students in each Year. This structure is also not helpful for composite/multi-age classes.
- The curriculum lacks continuity and coherence. This includes issues with the alignment of content across strands as well as within strands.
- The general layout and online presentation of the curriculum needs to assist teachers in programming, planning and resource identification. In its current form this is not achieved. The content headings contribute to the lack of cohesiveness of the curriculum and don't reflect a continuum of learning. The organisation of the three content strands does not allow for the explication of the proficiency strands.
- The curriculum does not recognise the Kindergarten and Years 6–7 transition points well.
- The curriculum does not cater for the full range of students nor provide a plan for the mathematics education of students with special education needs.

- There is too much content in the curriculum. This is at odds with the stated intention of allowing more time for students to study fewer topics in greater depth, through a reduction in the breadth of content.
- There is a lack of clarity in many of the content descriptions, which means that they will not 'stand alone' as necessary, given that coverage of the elaborations is not mandatory.
- Contextualisation and integration, the key tools for achieving student engagement, are largely absent from the curriculum, leaving it to appear abstract and overcrowded.
- The proficiency strands are not evident in content descriptions and achievement standards.
- The curriculum lacks appropriate representation of the role of mathematical language and communication through the proficiency strands.
- The development of mathematical representations, often associated with problem-solving or mathematical modelling, is not evident in the draft.
- A range of curriculum sequencing issues need to be addressed in order to promote meaningful development of concepts and skills from Year to Year.
- Evaluation of the draft curriculum and planning for student learning are difficult without the proposed underlying numeracy continuum.
- There is a lack of clarity in relation to the expected use of ICT in the curriculum, particularly in relation to the Years 7–10 curriculum.
- The achievement standards focus on content statements and are not useful in their current form for the assessment of student achievement. They do not always align with the content descriptions and the achievement of typical students. The expected level of achievement within the standards is inconsistent across the Years. The standards are not high enough in the early primary Years and overly-ambitious beyond the early primary Years.
- The curriculum lacks an appropriate level of linking between the content, the general capabilities and the cross-curriculum dimensions.
- The lack of information in relation to the implementation of the curriculum is making it difficult for schools to plan for the implementation of the curriculum.
- Effective implementation of the curriculum will require extensive professional development support for teachers in relation to pedagogy, content and resources.

1.3 Recommendations to ACARA

- The Year-by-Year structure of the curriculum should be replaced by a structure based on two-year stages or a series of levels from K–10, in order to cater more appropriately for the range of student learning needs.
- Ways of reducing the amount of content should be explored, with the view of allowing more time for students to study fewer topics in greater depth.
- Further work and careful checking of the curriculum needs to be undertaken in order to improve continuity, coherence, clarity and consistency. The various sequencing issues within the curriculum content need to be addressed and additional detail provided in the content descriptions.
- The proficiency strands need to be made evident in the content descriptions and in the achievement standards.
- The role of mathematical language and communication needs to be strengthened in the curriculum through the proficiency strands.
- A clear 'scope and continuum' of key ideas needs to be developed to assist teachers in programming the curriculum and tracking student learning and to help ensure the continuity and coherence of the final curriculum materials. These key ideas can be used to

develop consistent subheadings in revising the arrangement of the content descriptions across the curriculum.

- Further consideration needs to be given to the availability of different pathways within the curriculum for different groups of students. This has been recognised in part by the inclusion of Year 10A for higher-achieving students. However, the draft curriculum is not seen as having appropriate flexibility for lower, middle or higher-achieving students.
- Further consideration needs to be given to the scope of the curriculum to Year 10/10A with the aim to ensuring that higher-achieving students are prepared appropriately for high levels of senior mathematics.
- The proposed underlying numeracy continuum needs to be developed and distributed to assist teachers in the evaluation of the draft curriculum and in planning for student learning.
- Further work needs to be undertaken in order to clarify the expected use of ICT in the curriculum, particularly in relation to the Years 7–10 curriculum.
- The achievement standards need to be revised in order to improve their usefulness in the assessment of student achievement. This includes ensuring that they represent appropriate descriptions of the achievement of typical students, include appropriate representation of the proficiency strands, are of a consistent level across the Years, are high enough in the early primary Years, and are not overly-ambitious beyond the early primary Years.
- Links between the content of the mathematics curriculum, the general capabilities and the cross-curriculum dimensions need to be strengthened.
- Further development of the glossary needs to be undertaken in order to remove mathematical inaccuracies and to improve the clarity of a range of definitions.

2 Background Information

The Australian Curriculum, Assessment and Reporting Authority (ACARA) released the draft K–10 curriculum for the four Phase 1 learning areas on 1 March 2010. The curricula for English, Mathematics, Science and History were released in electronic format on a consultation portal for a period concluding 23 May 2010. The consultation portal allowed for response to an online survey as well as opportunities for specific feedback regarding individual content statements. During the consultation period ACARA conducted a trial of materials with 150 schools (25 in NSW), general forums in each State (including a stakeholder meeting on 25 March 2010 at the Wesley Centre), and subject-specific national meetings held in Sydney in April 2010.

ACARA has an established timeline that includes further curriculum refinement to follow the consultation period, with the release of the final curriculum in September 2010.

The NSW Minister for Education and Training has asked the Board of Studies to lead consultation in NSW in order to provide advice about the quality and suitability of the curriculum for NSW schools.

Consequently, the Board of Studies conducted a coordinated set of consultation activities to engage teachers and stakeholders and to seek their feedback. The consultation program consisted of a curriculum mapping activity, teacher meetings in regional and metropolitan venues, videoconferences, subject area stakeholder meetings, and a series of stakeholder meetings that focused on whole school issues and the implications for assessment, reporting and certification.

The NSW Mathematics consultation consisted of

- curriculum mapping undertaken by three expert practitioners in the learning area on 2 and 3 March 2010
- a full-day stakeholder meeting held at OBOS on 12 March 2010
- a video conference targeting teachers on 10 March 2010
- afternoon meetings with teachers at
  - Shellharbour on 9 March 2010
  - Dee Why on 15 March 2010
  - Dubbo on 18 March 2010
  - Castle Hill on 22 March 2010
- an online survey on the Board of Studies website for the period 8 March to 30 April 2010.

Professional associations and schooling sectors conducted a range of activities during the consultation period to inform feedback to the Board.

3 Summary of Respondents

3.1 Consultation at teacher and stakeholder meetings

6 teacher and stakeholder meetings

Stakeholders	26	Teachers	272

3.2 Online survey respondents

67 online survey responses

Years of schooling:

Kindergarten to Year 6	18	Years 7 to 10	49

Sector:

Government	30	Independent	25	Catholic	11
Other	1				

Response from:

Parent	3	Principal	2	School Executive	15
Student	13	Teacher	32	Other	2

Number of people contributing to the response:

1	47	2	5	3	2
4	5	5	0	6 or more	8

4 Summary of Key Matters Raised

Key matters raised for Mathematics arising from consultation
• The Year-by-Year structure of the curriculum creates the unrealistic expectation that all content will be taught to all students in each Year. Greater clarity is required regarding the flexibility teachers will have to differentiate the curriculum to cater for the range of student learning needs. Concerns were expressed about the extent to which the curriculum will cater for the needs of lower-achieving students (too much of the prescribed content will be inaccessible) and higher-achieving students (content will not be sufficient to extend these students in preparation for senior courses, and that more challenging material is not available before Year 10).
• A significant proportion of respondents raised concerns that too much content is prescribed in the curriculum. This is at odds with the stated intention of listing 'fewer detailed topics with the intention to encourage the development of important ideas in more depth, and promote the interconnectedness of mathematical concepts' (p. 5).
• There is a lack of clarity in many of the content descriptions, which means that they will not 'stand alone' as needed, given that coverage of the elaborations is not mandatory. eg Kindergarten Number and Algebra (4. Addition and Subtraction) *Model, represent and solve problems concerning additive and sharing situations involving combining, change and missing elements*; Year 2 Measurement and Geometry (2. Metric units) *Measure and compare length and capacity using uniform informal and familiar metric units and measure mass using balance scales with familiar metric units*; Year 6 Statistics and Probability (3. Variation) *Explore concepts of variation and error by collecting repeated measurements*; Year 9 (6. Visualisation) *Construct and identify elevations and cross-sections of three-dimensional objects, and explain reasoning*. Respondents also noted various aspects of content that have been omitted from the draft curriculum and need to be included. These include the multiplication facts and related division facts of 7, square roots and cube roots, conversions between metric units of measurement, and standard deviation. There was a general view among respondents that there is insufficient detail in the content descriptions and elaborations to promote a consistent treatment of content across schools and jurisdictions.
• While the intent of the proficiency strands was supported by most respondents, concerns were raised that the strands are not evident in content descriptions and achievement standards. Some respondents also indicated that additional detail and support for teachers will be necessary regarding the assessment of student learning in relation to the proficiency strands. The curriculum lacks appropriate representation of the role of mathematical language and communication through the proficiency strands.

Key matters raised for Mathematics arising from consultation

- Respondents raised a range of curriculum sequencing issues, including concerns regarding ordering of content and inappropriate 'gaps' in teaching sequences.

  eg (ordering):

  Year 5 Statistics and Probability (2. Summary statistics) *Identify the mode and median in lists and on dot plots*. However, students do not learn about taking the mean of two scores (necessary for finding the median of an even number of scores) until Year 7: Statistics and Probability (1. Data measures) *Determine mean, median, and range and use these measures to compare data sets explaining reasoning including using ICT*;

  Year 6 Statistics and Probability (1. Data representation) *Construct, read and interpret tables and graphs including ordered stem and leaf plots, and construct pie charts and other simple data displays including using technology*. However, there is no specific content in the draft curriculum in relation to circles until Year 8: Measurement and Geometry (3. Circles) *Investigate the relationship between features of circles such as circumference, area, radius and diameter and generalise these to solve problems involving circumference and area.*

  eg ('gaps'):

  Content in relation to two-dimensional shapes and three-dimensional objects is specified in Year 2 (1. Geometry) *Describe features of two-dimensional shapes and three-dimensional objects, draw them and use materials to make models of these* (and also in Kindergarten and Year 1) and in Year 4 (1. Geometry) *Generalise about the two-dimensional shapes that form the surfaces of common three-dimensional objects and make connections with the nets of these objects justifying reasoning*, but there is no content specified in relation to two-dimensional shapes and three-dimensional objects for Year 3;

  Year 5 Number and Algebra (7. Algebraic thinking) *Copy, continue, create and describe patterns with numbers and use graphs, tables and rules to describe those patterns*. There is no development of algebraic thinking/concepts specified for Year 6. Then, under the content description Variables in Number and Algebra in Year 7, students are required to *Apply the associative, commutative and distributive laws and the order of operations to mental and written computation and generalise these processes using variables*.

  These concerns will need to be addressed in order to promote meaningful development of concepts at each Year level. Particular concerns were raised in regard to the continuity of learning in K–6, with substantial conceptual 'jumps' identified by respondents between Year levels.

- Concerns were expressed about the difficulty of evaluating the draft curriculum and planning for student learning without the proposed underlying numeracy continuum.

- Concerns were raised regarding the lack of clarity on expected use of ICT in the curriculum. Additional direction is required on the depth and nature of ICT use in each content area. Concerns over access, equity and teacher support for ICT use were also raised.

Key matters raised for Mathematics arising from consultation
• A range of concerns were raised in relation to the draft achievement standards. Many respondents were concerned that the standards are not useful in their current form. In particular, there were concerns that the standards are currently not appropriate descriptions of the achievement of typical students since they focus on content and do not incorporate the proficiency strands to a sufficient extent. It was felt that the expected level of achievement within the standards is inconsistent across the Years. This included that the standards are not high enough in the early primary Years and overly ambitious beyond the early primary Years. Some respondents also questioned the usefulness of the standards for assessment and reporting.
• A broad range of concerns were identified in relation to the implementation of the curriculum, eg how do teachers cater for students who aren't working at the prescribed level in a given year?; indicative hours aren't known; how and when will the curriculum be rolled out?; details of the Senior Years Curriculum weren't known at the time of consultation meetings. Respondents indicated that the lack of such information is making it difficult for schools to plan for the implementation of the curriculum.
• Respondents noted that the content descriptions alone are insufficient to define what is to be taught or to support teachers in the implementation of the curriculum. It was also indicated that effective implementation of the curriculum will require extensive professional development support for teachers. This was seen as particularly important in K–6 due to the perception that the academic demands of the curriculum are higher (eg greater focus on fractions and decimals, introduction of ratio and rates in Year 6), and across K–10 due to the increased focus on Statistics and Probability.
• The curriculum lacks an appropriate level of linking between the content, the general capabilities and the cross-curriculum dimensions.

5 Analysis

5.1 Rationale

Overall Comments

The statements made in the Rationale need to align with the content of the curriculum. There are statements in the draft Rationale that have not been achieved in the current specification of the content.

The full range of students is not recognised in the current Rationale as it doesn't acknowledge students with special education needs. The importance of mathematics in the teaching and learning of other subjects also needs to be included in the rationale as well as in the aims.

Summary of feedback	Source/s
• The rationale recognises the richness and opportunities that learning mathematics provides for students.	Teacher consultation meetings, MANSW.
• The Rationale refers to catering for 'all students', but this has not been achieved through the current structure and content of the curriculum.	Stakeholder consultation meeting, CEC.
• It is not evident that the curriculum provides for 'carefully-paced in-depth study of critical skills and concepts', as stated in the Rationale.	Stakeholder consultation meeting.

5.2 Aims

Overall Comments

The statements in the Aims need to recognise the full range of student needs, learning styles and abilities. Concerns were expressed that students with high support needs 'won't be able to achieve these Aims'.

Summary of feedback	Source/s
• The aims are appropriate in number and recognise connections between mathematics and other disciplines and mathematics as an accessible and enjoyable discipline.	Teacher consultation meetings, MANSW.
• The different learning needs, learning styles and range of student abilities need to be recognised. High support-needs students are currently not represented in the Aims.	Stakeholder consultation meeting.
• The use of the word 'ensure' raised concerns, including in relation to its implications for testing.	Stakeholder consultation meeting.

5.3 Organisation of Content

Overall Comments

The Year-by-Year structure of the curriculum creates the unrealistic expectation that all content will be taught to all students each year. Greater clarity is required regarding the level of flexibility within the curriculum for differentiation and delivery in order to cater for the range of student learning needs.

There is a lack of coherence and continuity in the curriculum. There needs to be greater commonality and consistency in the way that the content is organised from Year to Year.

The general layout and online presentation of the curriculum needs to assist teachers in programming, planning and resource identification. In its current form this is not achieved. The content headings contribute to the lack of cohesiveness of the curriculum and do not reflect a continuum of learning. The organisation of the three content strands does not allow for the explication of the proficiency strands.

Summary of feedback	Source/s
• The online presentation of the content should prove valuable in terms of programming and planning. Plans for the ongoing linking of resources to the website are also viewed positively by teachers.	Teacher consultation meetings.
• The Year-by-Year structure of the curriculum does not enable sufficient flexibility to meet the needs of learners.	Stakeholder consultation meeting, teacher consultation meetings, surveys, DET, CEC, MANSW, Teachers Federation.
• The curriculum content lacks coherence, continuity and consistency.	Stakeholder consultation meeting, teacher consultation meetings, DET, CEC, MANSW, Teachers Federation.

5.4 Content Descriptions

Overall Comments

A significant proportion of respondents raised concerns that too much content is prescribed in the curriculum. This is at odds with the stated intention of listing 'fewer detailed topics with the intention to encourage the development of important ideas in more depth, and promote the interconnectedness of mathematical concepts' (p. 5).

There is a lack of clarity in many of the content descriptions, which means that they will not 'stand alone' as needed, given that coverage of the elaborations is not mandatory. There was a general view among respondents that there is insufficient detail in the content descriptions and elaborations to promote a consistent treatment of content across schools and jurisdictions.

Most respondents supported the intent of the proficiency strands, as they provide opportunities to engage students in their mathematics learning. However, significant concerns were raised that the strands are not evident in content descriptions and need to be made more explicit and consistent with the other strands and elements of the curriculum. Respondents also indicated that additional detail and support for teachers will be necessary regarding the assessment of student learning in relation to the proficiency strands.

Respondents raised a range of curriculum sequencing issues, including that there is a lack of clear evidence of research-based sequencing. These issues will need to be addressed in order to promote meaningful development of concepts at each Year level. Particular concerns were raised in regard to the continuity of learning in K–6. It was observed that the K–2 curriculum is of a generally lower level than expected, while the curriculum for Years 3–6 includes some quite challenging concepts. Respondents identified substantial conceptual 'jumps' between Year levels, as well as a range of omissions, including references to financial literacy between Year 3 and Year 9.

Summary of feedback	Source/s
• The majority of the content prescribed in the curriculum is similar to that of the NSW K–10 curriculum.	Teacher consultation meetings.
• There is too much content prescribed in the curriculum.	Stakeholder consultation meeting, teacher consultation meetings, surveys, CEC, AHISA, MANSW, Teachers Federation, IEU.
• There is a lack of clarity in many of the content descriptions, omission of various aspects of essential content, and insufficient detail in the descriptions to promote a consistent treatment of content across schools.	Stakeholder consultation meeting, teacher consultation meetings, surveys, DET, CEC, MANSW, Teachers Federation, IISME.

Summary of feedback	Source/s
• Concerns were raised that the proficiency strands are not evident in content descriptions.	Stakeholder consultation meeting, teacher consultation meetings, DET, MANSW, Teachers Federation.
• There is a range of sequencing issues within the content. These issues will need to be addressed in order to promote meaningful development of concepts at each Year level.	Stakeholder consultation meeting, teacher consultation meetings, surveys, DET, CEC, MANSW, Teachers Federation.
• Concerns were raised regarding the lack of clarity on expected use of ICT in the curriculum. Additional direction is required on the depth and nature of ICT use in each content area. Concerns over access, equity and teacher support for ICT use were also raised.	Stakeholder consultation meeting, teacher consultation meetings, surveys, CEC, MANSW, Teachers Federation, IISME.
• Key components of what is considered essential learning are not covered in sufficient depth. For example, multiplication and division are not strongly evident in K–6.	Stakeholder consultation meeting, teacher consultation meetings, surveys, CEC, Teachers Federation.
• The content for Kindergarten is below expectations in terms of number and measurement. Fractions and area should be included at this level.	Stakeholder consultation meeting, teacher consultation meetings, DET, Teachers Federation.
• Much of the language used in the content descriptions is too technical and/or wordy, particularly in K–6. Clarity and consistency of language is required and unfamiliar terminology needs to be explained.	Stakeholder consultation meeting, teacher consultation meetings, DET, AHISA, CEC.
• The implications of introducing calculators while students are learning to calculate are not addressed in the draft curriculum.	Teacher consultation meetings, DET, AHISA, IISME.
• Representations in mathematics should not be limited to the process of data representation, and should include the development of reasoning skills associated with problem-solving and modelling.	DET, IISME.

Online survey data

- The content descriptions focus on the essential learning for the subject.

Strongly Disagree	Disagree	Agree	Strongly Agree
9	11	25	5
18.0%	22.0%	50.0%	10.0%

- The sequence of content is logical and appropriate to the students' stage of development.

Strongly Disagree	Disagree	Agree	Strongly Agree
11	21	17	1
22.0%	42.0%	34.0%	2.0%

- The descriptions of content are specific enough to support teaching.

Strongly Disagree	Disagree	Agree	Strongly Agree
12	19	18	1
24.0%	38.0%	36.0%	2.0%

5.5 Achievement Standards

Overall Comments

A range of concerns were raised in relation to the draft achievement standards, which in general are seen as a very important part of the curriculum. Many respondents felt that the achievement standards are not useful in their current form as they appear to represent only a brief summary of the content, rather than a sound basis for assessing and reporting student achievement.

The final achievement standards will indicate what is valued in the curriculum. Currently the achievement standards focus on the content strands.

If student learning in relation to the proficiency strands is to be appropriately assessed the proficiency strands need to be expressed to an appropriate level of detail and reflected more explicitly in the content descriptions and achievement standards. Currently, the proficiency strands are not sufficiently evident in the achievement standards.

The intention/purpose/status of the Year 10A content is unclear. Its inclusion introduces a second set of achievement standards for Year 10. While this appears to be an attempt to meet the needs of high-achieving students, more explanation is needed.

Summary of feedback	Source/s
• The achievement standards, following revision, should prove valuable in supporting the assessment of students.	Teacher consultation meetings.
• Concerns were raised that the proficiency strands are not sufficiently evident in the achievement standards. They need to be made more explicit and consistent with the other strands and elements of the curriculum.	Stakeholder consultation meeting, teacher consultation meetings, DET, CEC, MANSW.
• Respondents were of the view that the standards are currently not appropriate descriptions of the achievement of typical students and that the standards do not always align with the content, and the expected level of achievement within the standards is inconsistent across the Years. This included that the standards are not high enough in the early primary Years and overly-ambitious beyond the early primary Years.	Stakeholder consultation meeting, teacher consultation meetings, surveys, AHISA, DET, CEC, MANSW, IEU.
• The achievement standards in their current form are not useful for teachers as a basis for assessing and reporting student achievement.	Stakeholder consultation meeting, teacher consultation meetings, surveys, CEC, MANSW.
• Financial literacy is currently not well represented in the achievement standards.	Stakeholder consultation meeting, teacher consultation meetings, MANSW.

Online survey data

- The standards for each year of schooling represent an appropriate level of achievement.

Strongly Disagree	Disagree	Agree	Strongly Agree
5	20	17	1
11.7%	46.5%	39.5%	2.3%

- The standards form a sound basis for guiding assessment and reporting.

Strongly Disagree	Disagree	Agree	Strongly Agree
5	17	21	0
11.6%	39.5%	48.9%	0%

5.6 Catering for the full range of students

Overall Comments

The Year-by-Year structure of the curriculum creates the unrealistic expectation that all content will be taught to all students each year. Concerns were expressed about the extent to which the curriculum will cater for the needs of lower-achieving students (too much of the prescribed content will be inaccessible) and higher-achieving students (content will not be sufficient to extend these students in preparation for high-level senior mathematics courses, and that more challenging material is not available before Year 10). For example, lower-achieving students will find it very difficult to come to terms with the level of difficulty and abstraction of the Years 9 and 10 curriculum. The divergence of student achievement has been recognised by the development of four mathematics courses for Years 11 and 12. Such differentiation in the curriculum needs to be instigated earlier than Year 11, to ensure that students are studying mathematics to the level of complexity for which they are ready.

Summary of feedback	Source/s
• Respondents felt that the curriculum does not account for the needs of the full range of students, including that it does not provide a plan for the mathematics education of students with special education needs.	Stakeholder consultation meeting, teacher consultation meetings, surveys, AHISA, DET, CEC, MANSW, IEU.
• The appropriateness of the Year-by-Year structure for all students is not clear. Guidance is required in relation to how teachers can use the curriculum content across Years to meet the needs of their students.	Stakeholder consultation meeting, teacher consultation meetings, DET, CEC, MANSW, Teachers Federation.

5.7 General capabilities and cross-curriculum dimensions

Overall Comments

A number of issues were raised in relation to the incorporation of general capabilities and cross-curriculum dimensions in the curriculum. These include the lack of the proposed continuums for literacy and numeracy.

Respondents were of the view that the Aboriginal and Torres Strait Islander cross-curriculum dimension is lacking and that the overlap of thinking skills with reasoning and problem-solving needs to be addressed. Creativity should include links to real-world problems, especially since there are references to this in the document, but not within the content. Some respondents expressed concern regarding accessibility, equity and resourcing implications for ICT, given, for example, the mandatory use of calculators in Year 2.

Literacy needs to be expanded upon to include all aspects of communication in mathematics. The general capabilities of self-management, teamwork, intercultural understanding, ethical behaviour and social competence are currently addressed in mathematics only by stating that they 'are all relevant to the pedagogy used by teachers of mathematics'. Further expansion of these capabilities in relation to mathematics needs to be provided.

Summary of feedback	Source/s
• The general capabilities and cross-curriculum dimensions need appropriate refinement so that they can be used effectively in developing strong teaching and learning programs for the range of students.	Teacher consultation meetings, MANSW.
• Considerable further work is required in relation to the appropriate incorporation of the general capabilities and the cross-curriculum dimensions within the curriculum content. The need to identify numeracy concepts in other learning areas is also an issue.	Stakeholder consultation meeting, surveys, MANSW.
• Clear and well-sequenced literacy and numeracy continuums are required for the use of all teachers.	Stakeholder consultation meeting, teacher consultation meetings, MANSW.

Online survey data

- There is appropriate emphasis given to the general capabilities and cross-curriculum dimensions in the content descriptions.

Strongly Disagree	Disagree	Agree	Strongly Agree
2	19	26	0
4.3%	40.4%	55.3%	0%

- The general capabilities and cross-curriculum dimensions are represented in authentic ways.

Strongly Disagree	Disagree	Agree	Strongly Agree
3	19	21	1
6.8%	43.2%	47.7	2.3%

5.8 Other comments

Respondents felt that a 'scope and continuum' needs to be developed for the use of teachers and to help ensure the quality of the final curriculum materials.

The curriculum was intended to provide the opportunity for students to study mathematics topics in greater depth, but this has not been achieved in the current draft with the amount of content.

It was noted that mathematical concepts are not represented appropriately through the proficiency strands, while the content statements do not emphasise mathematical communication. The content statements also do not explicate mathematical reasoning to an extent that the requirements of the curriculum can be interpreted successfully by teachers. A range of mathematical inaccuracies in the content descriptions need to be addressed.

A broad range of concerns were identified in relation to the implementation of the curriculum, eg how do teachers cater for students who aren't working at the prescribed level in a given year?; indicative hours aren't known; how and when will the curriculum be rolled out?; details of the Senior Years Curriculum weren't known at the time of consultation meetings. Respondents indicated that the lack of such information is making it difficult for schools to plan for the implementation of the curriculum.

Respondents noted that the content descriptions alone are insufficient to define what is to be taught or to support teachers in the implementation of the curriculum. It was also indicated that effective implementation of the curriculum will require extensive professional development support for teachers. This was seen as particularly important in K–6 due to the perception that the academic demands of the curriculum are higher (eg greater focus on fractions and decimals, introduction of ratio and rates in Year 6), and across K–10 due to the increased focus on Statistics and Probability.

Summary of feedback	Source/s
• The online format provides possibilities for future use in terms of programming, linking to resources, and linking to the curriculum in other learning areas.	Teacher consultation meetings, MANSW.
• Concerns were expressed about the difficulty of evaluating the draft curriculum and planning for student learning in the absence of the proposed underlying numeracy continuum.	Stakeholder consultation meeting, teacher consultation meetings, CEC, MANSW.
• Various concerns were raised in relation to implementation, including the current lack of information for planning. Primary teachers indicated that appropriate time and support is critical with four new curricula to implement.	Stakeholder consultation meeting, teacher consultation meetings, AHISA, IEU.

Summary of feedback	Source/s
• Many respondents felt that teachers will need high levels of support and professional development to implement the curriculum well.	Stakeholder consultation meeting, teacher consultation meetings, AHISA, Teachers Federation, IISME.
• Some respondents also indicated that additional detail and support for teachers will be necessary regarding the assessment of student learning in relation to the proficiency strands.	Stakeholder consultation meeting, teacher consultation meetings, MANSW.
• The nature and content of the new curriculum has serious implications for teacher training.	Stakeholder consultation meeting, teacher consultation meetings.
• Teachers need to know the timeframe for the implementation of NAPLAN testing based on the new curriculum to ensure that students are not disadvantaged.	Stakeholder consultation meeting, teacher consultation meetings.
• The draft glossary contains a number of inaccuracies. A range of definitions need to be revised to improve their clarity, while other definitions need to be included.	Teacher consultation meetings, IISME.
• The approach taken to incorporating the proficiency strands in the content makes clear the integrated nature of mathematics as a complete discipline.	AHISA
• Once issues are resolved, the online format will be helpful to teachers.	Teacher consultation meetings, AHISA.

6 Respondents

6.1 Responses from individuals and groups

Responses were received from the following individuals and groups:

- NSW Department of Education and Training (DET)
- Catholic Education Commission of NSW – Officers Forum (CEC)
- Association of Heads of Independent Schools of Australia NSW (AHISA)
- The Mathematical Association of NSW (MANSW)
- NSW Teachers Federation
- NSW/ACT Independent Education Union (IEU)
- Institute for Innovation in Science and Mathematics Education – The University of Sydney (IISME)
- The Scots School, Bathurst

6.2 Stakeholder meeting at the Board of Studies on 12 March 2010

Name	Organisation
Jenny Allum	Association of Heads of Independent Schools of Australia
Judy Anderson	University of Sydney
Janette Bobis	University of Sydney
Shirley Brady	Catholic Education Commission
Garry Brown	Association of Heads of Independent Schools of Australia
Karen Buck	Professional Teachers' Council
Carmel Coady	Committee of Chairs of Academic Boards
Matt Dooley	Independent Primary Schools Heads Association of Australia
Chris Francis	NSW Department of Education and Training
Jan Harte	Catholic Education Commission
David Hope	Federation of Parents and Citizens' Associations of NSW
Mary Hor	NSW/ACT Independent Education Union
Coral Kemp	Australian Association for Special Education NSW Chapter
Lenie Kumulia	NSW Parents Council

Margaret McKay	Association of Independent Schools of NSW
John Morris	NSW Teachers Federation
Stuart Palmer	Professional Teachers' Council; Mathematical Association of NSW
Ernest Pekar	NSW Teachers Federation
Kerry Poole	NSW Primary Principals' Association
John Rafferty	NSW/ACT Independent Schools of NSW
Peter Rundle	Association of Independent Schools of NSW
Debra Sharkey	NSW Teachers Federation
Jan Stone	Association of Independent Schools of NSW
Steve Tobias	Committee of Chairs of Academic Boards
Kristen Tripet	Association of Independent Schools of NSW

6.3 Teacher meetings

Venue	Date	K–6	Years 7–10	Unspecified	Total
Shellharbour Workers Club	9 March	19	24		**43**
Dee Why RSL	15 March	11	9	41	**61**
Dubbo RSL	18 March	5	4	6	**15**
Castle Hill RSL	22 March	15	27	84	**126**
7–10 video conference to Gosford High School	10 March		26		**26**