

**RESPONSE OF THE SACE BOARD TO ACARA
ON THE DRAFT SENIOR SECONDARY AUSTRALIAN CURRICULUM
JULY 2012**

1. CONTEXT

The SACE Board of South Australia is an independent statutory authority established under the SACE Board of South Australia Act 1983. The SACE Board has legislative responsibility for the accreditation, assessment, recognition and certification of learning in the senior secondary years of schooling in South Australia, through the South Australian Certificate of Education (the SACE).

In South Australia the governance responsibility for senior secondary curriculum is a collaborative one between the SACE Board of South Australia and the Government, Catholic, and Independent school sectors. South Australia does not have a single board of studies with responsibility for the accreditation and assessment of learning for K–12. In this context the SACE Board's formal response to ACARA has been prepared in collaboration with the three school sectors.

The SACE Board convened a series of consultation meetings with subject experts from the three school sectors, professional associations, the SACE Board's subject-specific advisory groups and Chief Assessors, and senior representatives of the three school sectors to advise it in analysing and responding to curriculum, assessment, and certification issues emerging from the draft senior secondary Australian Curriculum documents.

2. POSITION OF THE SACE BOARD OF SOUTH AUSTRALIA

This paper presents recommendations on the overarching and specific issues that need to be addressed before the draft senior secondary Australian Curriculum content and achievement standards can be endorsed by the SACE Board.

Given that the content and achievement standards are interrelated, the issues in both must be resolved before they are ready to be endorsed.

1. The SACE Board's primary purpose in giving advice to ACARA on the draft senior secondary Australian Curriculum content and achievement standards for English, Mathematics, Science, and History is to ensure that the final product to be submitted for Ministerial approval is relevant, engaging, meets state and national targets for increasing student enrolments, and provides a vehicle for delivering the goals of the Melbourne Declaration on excellence and equity in schooling.
2. It is the position of the SACE Board that the draft senior secondary Australian Curriculum content and achievement standards are not sufficiently relevant or well designed, and the need for restructuring will make it unlikely that they can be submitted for Ministerial approval within the timeline set by ACARA.
3. Consultation with state and territory curriculum, assessment, and certification authorities is needed on the nature, quality and volume of the content and the coherence and sequencing of the topics and concepts.

The SACE Board has previously provided formal advice on the content in May 2010 and November 2011. Staff of the SACE Board have provided subject-specific advice at forums and videoconferences in 2010, 2011, and 2012. Key issues, particularly in the nature, quality, and volume of content in mathematics and science units, have still not been adequately addressed.

4. Consultation with state and territory curriculum, assessment, and certification authorities is needed on fundamental issues in the construct of the achievement standards.

The SACE Board's letter of 28 November 2011 noted: 'The Board defers acceptance of the design specifications until it has the opportunity to provide formal comment on the conceptual and operational model for achievement standards ('levels of achievement') in the senior secondary Australian Curriculum.' The May to July 2012 consultation is the first opportunity to provide such comment. The extent of issues in the design of the achievement standards as presented in the consultation drafts means that further work and formal consultation is required to reach an acceptable model.

It is the view of the Board that the 'Design Specifications – Senior Secondary' (ACARA Curriculum Design Paper Version 3) do not provide a sufficient conceptual frame for the achievement standards model presented in the consultation drafts for English, Mathematics, Science, and History.

3. KEY RECOMMENDATIONS

3.1 Lack of Topic Relevance, Quality, and Coherence

Greater relevance, quality, and coherence is required in the content for the 14 subjects.

ACARA has acknowledged that curriculum, assessment, and certification authorities will determine how they integrate the Australian Curriculum content and achievements standards into courses, including exit points. There must be sufficient relevance, quality, and coherence in the topics for this integration to occur.

As a working principle to help decide whether a concept should be included in the content, each concept should be connected to another, either within or across topics.

This lack of relevance, quality and coherence is particularly evident in the science and Specialist Mathematics units. It will be difficult to attract students to and retain them in the study of these subjects, at a time when increasing enrolments is a national priority. The selection of topics and concepts does not match the statements in the consultation document rationales about relevance and engagement, especially in the sciences and Specialist Mathematics. This limits the opportunity for application of relevant, engaging, and contemporary concepts, or developing and connecting concepts and topics across units.

Specific examples are:

- The highly theoretical nature of some of the science units will be a further disincentive to students to engage in the study of science.
- The content of the Physics units in particular, with a heavy theoretical and mathematical emphasis at the start, contradicts the aim: 'to develop students' appreciation of the wonder of Physics and the significant contribution Physics has made to contemporary society'. (p.2) It is the view of the SACE Board that the

content as it is presented will be a major disincentive to undertaking the study of Physics.

- Greater balance is needed between theory and application across the science subjects, with a higher weighting on contemporary relevance of theoretical knowledge that is linked to engaging applications.
- The inappropriate selection of topics in Specialist Mathematics will not encourage more students to study mathematics at this level.
- Subject experts in Biology strongly advise that Units 2 and 3 would make a more coherent package for students in Year 12, rather than Units 3 and 4, as presented in the consultation drafts.

Recommendation 1: That ACARA revise the content and achievement standards to ensure that there is no mismatch between the selection of content and the statements in the consultation rationales about appropriateness and relevance of content and engagement of students.

Recommendation 2: That ACARA review the relevance, quality, and coherence of topics, the connectedness of content across topics, and the sequencing of topics across units in the 14 subjects.

3.2 Reconsideration of Content

Across the 14 subjects, in particular in the mathematics and science units, the volume of content mitigates against depth of study and will lead to superficial coverage of a breadth of disconnected, or partly connected, topics and items of knowledge. This will limit the engagement of students to make connections in their learning that lead to the achievement of higher-order outcomes.

In the mathematics and science units, approaches to teaching in a contextual manner will be compromised if the amount of content is retained.

Recommendation 3: That the content across the 14 subjects be restructured to reduce the excessive volume, by:

- **reducing the number of topics in Mathematics and Science subjects;**
- **presenting topics and key concepts ('conceptual focus' statements) as required content; and**
- **presenting the next level of detail – the 'sub-points' – as examples, to guide teachers on the intended breadth and depth of student learning, while allowing for flexibility of structure, delivery, and assessment.**

3.3 Achievement Standards

It is the view of the SACE Board that the model for the development of achievement standards across the 14 subjects requires a clearer conceptual frame.

Specific issues in the achievement standards model are:

- Assumptions about an underlying assessment model; and
- Limited qualification of levels of achievement.

Assumptions about an underlying assessment model

The achievement standards model for the senior years appears predicated on the assumption that different assessment items will be set for different grade levels, leading to more itemised assessments that result in superficial coverage of a breadth of content at the expense of depth of learning.

This itemised model would assume that a student who gains a particular grade is able to meet the descriptions in each of the lower grades. However, it limits scope for designing in-depth assessment tasks that encourage all students to strive for achievement at the highest level.

Limited qualification of levels of achievement

The limited use of qualifiers in the hierarchy of verbs in the achievement standards gives insufficient direction to teachers to assess *how well* or in how much depth students have demonstrated their knowledge, understanding, and skills. The SACE Board notes ACARA's concern about limiting the use of *quantifiers*, and instead using content statements in the achievement standards to specify what students are expected to do. However, with a lack of adequate qualifiers or coherence in the content statements, the achievement standards fall short of the stated design aim of exemplifying a range of performance for a given subject.

There is a lack of alignment between the content and the design of the achievement standards. An example of this is the limited access that students at the C level have to achieving the content in relation to evaluating and analysing.

Overall, the achievement standards are insufficiently distinctive in terms of the quality of student work. In some achievement standards, the distinction between the grade levels amounts to just one or two words. There is too much similarity between the sub-points across the different levels for some of the achievement standards to appropriately differentiate evidence of learning. The inconsistent inclusion of specific content references raises further questions rather than providing clear direction.

Recommendation 4: To assist in the development of appropriate achievement standards for each of the 14 subjects, that ACARA make public a clear, comprehensive conceptual frame for the senior secondary Australian Curriculum achievement standards, which would appropriately exemplify the range of performance in each subject.

Recommendation 5: That ACARA review the achievement standards for each of the 14 subjects, ensuring alignment between content and achievement standards, and that the levels of achievement are described sufficiently well to distinguish the quality of student work between one grade and another.

4. SUBJECT-SPECIFIC ADVICE AND RECOMMENDATIONS – SCIENCE

4.1 Key Issues in Science – Content

Reduction of Content

- The volume of content in all science units remains a major concern. If the units are to be taught in the recommended 50-60 hours including assessment, there would be breadth without depth. This is contrary to an education philosophy of learning with understanding and relevance to the student. There would be considerable emphasis on memorising information without the opportunity to apply concepts in appropriate contexts.

- The presentation of the content is problematic. For example, the use of the words 'and' and 'including' together with the use of plurals make some of the sub-points very lengthy and demanding:

Select, construct **and** use appropriate representations, **including** flow diagrams of cell processes, diagrams of cells **and** tissues, organs and body system; **and** images of cells, tissues, organs or systems from different scanning techniques, to communicate conceptual understanding, solve problem **and** make predictions (Unit 2).

Lack of coherence within and between topics

- There is a lack of coherence between topics, and in some cases the relationship between particular sub-points is not well connected. There is little opportunity for application of concepts or developing and connecting concepts and topics across units.
- As a working principle to help decide whether a concept should be taught in a unit, each concept should be connected to another within the content.

Clarification of topics

- It is not clear to what depth the various content in Science Knowledge strand should be taught. Some sub-points would require 2 weeks of teaching, while others could be addressed in 10 minutes. For example, in Biology, the reference to 'the use of statistical analysis' (p. 16) needs further explanation. This could mean anything from taking averages to the use of chi-square tables.

4.2 Additional Advice on Design and Structure of Content in Science

Biology

Lack of coherence between topics

- It is strongly argued that there is little coherence in the content for Biology. Experts advise that Units 2 and 3 would make a coherent package for students in Year 12, rather than the current Unit 3 and 4.
- The introduction of a fundamental concept, such as 'cells', in only one unit (unit 2 in this case), and not reintroducing the concept in other units, is not supported. This is a fundamental flaw in the selection of topics, as it compartmentalises them and mitigates against students understanding the connections in their study. This approach means that students study this concept once and do not revisit and further develop understanding in greater depth at a later stage.
- Some topics are inappropriate for study at Year 11 and 12. Unit 4 contains immunology. University experts have advised that this should be removed due to the complexity of the processes and the changing understanding that scientists have of this area. Further, the sub-points below would require considerable teaching time:
 - When pathogens cross the surface physical and chemical barriers of animals and enter the body, they can cause changes to the internal environment and stimulate immune system responses (p.22)
 - The mammalian immune system responds to the presence of pathogens (for example, bacteria and viruses) in the internal environment in general ways, including an inflammation response, and in specific ways, including antibody- and cell- mediated responses, in the long- and short-term. (p.22)

These concepts do not relate well to the other parts of the topic in Unit 4.

- The topic title for the second topic in Unit 4, 'The dynamic biosphere: models of change and resilience' (p.22), does not describe the content well. It is not about models of change and resilience. It is about actual change and resilience. It is suggested to return to the title 'The Dynamic Biosphere', as it was in a previous version.

Reduction of Content

- The volume of content in Biology remains a concern. Example of how this could be addressed include:
- Aspects of inheritance that have been included would appear to be largely a repetition of Year 10. These could be omitted to reduce some content.

Frequencies of genotypes and phenotypes of offspring can be predicted using probability models, including Punnett squares, and by taking into consideration patterns of inheritance, including dominant genes, autosomal and sex-linked genes, multiple alleles and polygenic inheritance. (p.17)

Pedigree charts can be analysed to determine whether inherited traits are dominant or recessive and to identify and predict patterns of inheritance. (p.17)
- The emphasis on field work in Unit 1 is supported, but the requirement to include it in Unit 4 is of concern, given the likely compressed time that is available within which this unit would be undertaken, i.e. a shortened semester leading up to final assessments.

Chemistry

Lack of coherence between topics

- There is little opportunity for sequential development of concepts from one unit to the next. For example, redox is only covered in Unit 3. This means that students study this concept once and do not revisit and further develop understanding at a greater depth at a later stage. This could be remedied in this instance by adding a section on the chemistry of the earth in Unit 2: Chemicals in the Environment. This could include topics on metal displacement and silicates. This would allow an introduction to redox to be included here.

Lack of relevance

- The introduction to Chemistry is too theoretical. The topics in Unit 1 emphasise the knowledge and understanding of models and theories, particularly in the Science as a Human Endeavour sections. Together with the substantial use of mathematical calculations in this unit, this introduction to Chemistry at senior secondary level is too heavy. The Science as Human Endeavour strand, as described, mostly lends itself to rote learning. The Science as Human Endeavour strand should be presented as ideas for contexts that can be used to deliver the concepts and skills, and not as examples that have to be learned. Students need to encounter and engage with ideas that can be applied in different contexts, not simply facts that can be regurgitated. The Science as Human Endeavour sections should focus on practical applications to which students can relate. These applications must be able to be selected by individual teachers in their schools to suit their student cohorts.
- The inclusion of the Science as Human Endeavour strand is supported. However, the treatment is too biased towards the history of famous scientists, and not focused on the ideas, concepts, and contemporary applications of science.

- There should be more opportunities for students to directly relate their study to the chemistry of everyday living. Unit 3 should include a topic on the synthesis of biochemicals such as carbohydrates, proteins, and triglycerides. This could be incorporated in the third point about chemical reactions in Synthesis Processes.

Reduction of Content

- There is too much content in each of the units for Chemistry. The amount of content will compromise the ability of teachers to engage students in relevant, contextualised learning. Some topics could be deleted, for example:
 - The Lewis model of acids and bases is an unnecessary and confusing inclusion in Unit 2, as is the mention of the ADOMAH Periodic Table in Unit 1.
 - The knowledge of K_a and K_b is an unnecessary addition to the content, as K_c values can be used for the same purposes.
 - The gas laws and gas equation are unnecessary additions to the content since they have little relevance and application to the issues studied at senior secondary level.
 - The use of E^0 values is an unnecessary theoretical addition to the content. It is just another skill that adds more time to the course without a lot of usefulness.
 - In the Spectroscopy topic there should be a choice to select only one type to study in detail.

Earth and Environmental Science

Selection of Content

- The selection and division of the topics in Units 1 and 2, and Units 3 and 4 is problematic. The majority of the students who study this subject in South Australia will enter at Year 12. Thus, they will only be covering Units 3 and 4. This will create a difficulty for this cohort, as most of the geological aspects are in Units 1 and 2.
- The presentation of the content is problematic. It is unclear as to how much depth each topic should cover. There would not be enough time if all were covered in depth.
- Units 3 and 4 have a negative undertone as they focus on problems and hazards with little indication of positive effects.

Physics

Interest

- As an introductory unit, Unit 1 is dry and uninteresting to students. It does not meet the first aim of the content: 'to develop students' appreciation of the wonder of Physics and the significant contribution Physics has made to contemporary society'. (p.2)
- In the Organisation of content, Science as a Human Endeavour, there is the statement:

'It acknowledges that in making decisions about science practices and applications, ethical and social implications must be taken into account.'

(p.4)

The intent of this statement does not appear to have been enacted in the content, where there is a heavy emphasis on theories and models. Applications provide a

context within which students can develop their understanding of concepts in a much more relevant way.

- There are some applications named, but there does not seem teaching and learning time to delve into them. The historical makeup of the models seem to be a bigger focus than contemporary physics-based devices, like the cyclotron, Blu-ray players, 3D glasses, MRI scanners, PET scanners, radiotherapy, X-rays, photocopiers, electrostatic precipitators, and loudspeakers.
- Units 1 to 3 are all of a similar level of difficulty, with little progression in building on conceptual knowledge. Interference and photoelectric effect appear in Unit 2 (Year 11), straight after students have done the motion topics. This is probably the most conceptually challenging material for Year 12 students to understand, yet it is in the Year 11 units. Unit 4 is seen by many as being at university level.
- Work in electric circuits is seen as being dated and not part of the students' real world of iPods and iPads, MP3 players, game consoles, and the like.

Lack of Coherence

- Teachers believe that the introduction to Physics is too theoretical and demanding. The level of difficulty of the mathematics in Unit 1 will be too challenging for many students. Teachers have recommended that Unit 2 would provide a much better introduction to Physics.
- There are significant issues with Unit 4. Teachers feel it would be difficult to both engage the students and to develop the listed Science Inquiry Skills. It is seen as having a very academic approach. Because it is about theories and models, it would be difficult for students to use quantum theory to:
 'Design investigations, including the procedure to be followed, the materials required and the type and amount of primary and/or secondary data to be collected; conduct risk assessments; consider research ethics' (p.32)
- There is concern from the university sector that teachers would not have an appropriate background to teach Unit 4 as it is very complex.
- The presentation of the content is problematic. The depth of treatment of some sub-points within the strands is often not evident until teachers look at the mathematical representations. Greater clarity within the content would support teachers better.

Reduction of Content

- All four units have too much content. It is counterproductive to teaching for understanding if the volume of content is retained. Some concepts that are not related to other concepts should be deleted, for example:
 - interference and mechanical waves from Unit 2
 - the Einstein section from Unit 4
 - fission and fusion, i.e. last four sub-points of nuclear model content, from Unit 1
 - some of the motion (as it is in Year 10), and the last two sub-points of waves – superposition and resonance from Unit 2
 - escape velocity from gravity, emf and lenz law from EM, from Unit 3
 - relativity and all statements that make reference to the big bang (as this is in Year 10) from Unit 4.

4.3 Key Issues in Science – Achievement Standards

- Qualifiers (adverbs or adjectives) are important for teachers to determine the appropriate grade to assign. Very few of the achievement standards describe the quality of student work. Where the quality of work is described, it is generally only part of the standard. Without the qualifiers (that is, adverbs or adjectives) teachers will find it difficult to make a judgment.

For example, at the A level, the descriptor 'communicates **clearly** and **accurately** in a **wide** range of modes, styles and genres' (Biology, p.13). Here 'clearly' describes the quality of work. However, in the descriptor 'evaluates processes and claims' there is no qualifier. This statement could describe work that is a very thorough and detailed evaluation or a superficial or limited evaluation.

- The change in the language in moving from one grade level to the next needs to show a uniform progression in achievement.

In the following example, the step between A and B is much greater than the step between B and C:

- A evaluates the theories and model/s used to describe the system; the supporting evidence and the aspects of the system they include
- B describes the theories and model/s used to describe the system
- C describes a theory model used to describe the system.
(Biology, p.13)

In the following example, the difference between these two grades is difficult to decipher:

- D identifies processes and observable phenomena
- E identifies some observable phenomena.
(Biology, p.13)

In the following example there is not a logical progression between the grades:

- C analyses data to identify relationships between variables
- D analyses data to identify simple trends and relationships
- E identifies simple trends in data and presents basic conclusions.
(Biology p.12)

- The use of some language does not adequately differentiate between levels of achievement.

For example, the utilisation of secondary sources does not necessary lead to a better investigation design as in this example:

- A utilises secondary sources to design and conduct safe, ethical investigations to collect valid, reliable data in response to a specific question, hypothesis or problem
- B designs and conducts safe, ethical investigations to collect valid, reliable data in response to a specific question, hypothesis or problem.
(Biology, p.24)

It appears in a number of descriptors that the A student is rewarded for doing more quantity of work without recognising the *quality* of the student's work.

- In several instances, there are descriptors that are either missing in the D and E grade or the descriptors have been combined into one. For the sake of clarity, there should be a consistent number of elements but demonstrating a different level of achievement from A to E.

- The use of the term 'evaluate' is at times used inappropriately. For example, 'evaluates the theories and model/s used to describe the system' (Biology, p.12); is likely to refer to a single, generally accepted theory. To expect students to evaluate such a theory is unrealistic. The word 'theory' is only used in science when there has already been extensive evaluation by academic scientists. If students at the A level were expected to explain and use these theories perceptively/competently/thoroughly, their achievement would be more apparent. B and C level students should still be expected to explain and use the theories, though in a less proficient way.
- Some of the descriptors are too complex for a single assessment. For example, 'Evaluates how Chemistry has been used in concert with other sciences to meet diverse needs and inform decision making; and social, economic and ethical implications of these applications.' (Chemistry, p.29)

This is a very long and complex statement (which at the E (and D) level becomes 'Describes ways in which chemistry has been used in society (to meet needs)' (Chemistry, p.31)

4.4 Additional Advice on Design and Structure of Achievement Standards in Science

- To differentiate between the grades in terms of the amount of content that a student is able to learn is not supported.
- The focus of some of the descriptors is not clear. Wherever possible, there should only be one focus per descriptor, or aspects of content that can be integrated. Descriptors with more than one aspect of content have the propensity to confuse assessors, as it is not clear if one aspect is more important than another, or whether all aspects need to be covered equally. An example follows:
 'applies theories and models of systems and processes to make plausible predictions, explain new phenomena, and solve complex problems'
 (Biology, p. 12)
- The rationale for not having the same number of descriptors for D and E grades as in A to C grades is not convincing.
- Is it understood that use of the verbs 'identifies', 'describes', 'explains' and 'evaluates' are subsumed? That is, that if a student is able to 'evaluate', is it assumed that they are also able to identify, describe, and explain? While the one can understand that in setting an examination that covers the content and skills of a unit, a selection of questions would be included that identify, describe, explain, etc., it does assume that when setting a practical or investigation or larger task, the task itself is able to be deciphered using this differentiated verbs model.

5. SUBJECT-SPECIFIC ADVICE AND RECOMMENDATIONS – MATHEMATICS

5.1 Key Issues in Mathematics – Content

Quality of Content

- Problem-solving is presented in a limited way, rather than being open-ended and enabling an investigative approach (or other piece of work that is more substantial than a supervised test).

Reduction in Content

- The amount of content in mathematics subjects, particularly in Specialist Mathematics and Mathematical Methods, remains a key issue. The amount of content will compromise the ability of teachers to engage students in relevant, contextualised learning.

5.2 Additional Advice on Design and Structure of Content in Mathematics

Specialist Mathematics

Quality of Content

- The inappropriate selection of topics in Specialist Mathematics will not encourage more students to study mathematics at this level. There is a lack of coherence of the topics in this subject, and no clear rationale for the selection of these topics. Experts advise that the set of topics across the four units will not encourage more students to study Mathematics at this level.
- The proof by induction in Unit 1 is too conceptually difficult for students at the beginning of Year 11. It is recommended that it be moved to Unit 3.

Mathematical Methods

Reduction of Content

- Unit 1 is unnecessarily in Mathematical Methods is too long.

Quality of Content

- A rationale is needed for why the five Calculus topics need to be distributed over all four units. It would be better for coherence if some of them were combined.
- The treatment of the content is misleading if words such as ‘review’ are used. For example, the use of the word ‘**review**’ (p.4), ‘**Review of quadratic relationships**’ implies that the teachers should spend minimal time on this topic. It is recommended that the phrase ‘**review of**’ be deleted, given that students will need to spend considerable time on this topic at the beginning of Unit 1.

General Mathematics

Coherence

- Topic 2 of Unit 4: Statistics 3 – Time series analysis should be removed and replaced with a topic on share investments. This would flow very well from Topic 1 in Unit 4.

Essential Mathematics

Quality of Content

- The statement in the rationale suggests that the students undertaking this subject are being prepared for the likelihood of moving to 'employment or further training' (p.1). There is very little in the content that would provide students with the knowledge and skills that they need to go on to further training. This is particularly so for students who may wish to exit at the end of Unit 2, and are looking for an apprenticeship. Such students are more likely to need Units 2 and 3. The sequencing of content should be revised.
- The selection of topics in this subject is not tapping into the contemporary needs of the cohort. For example:
 - some aspects of the topic Finance and Budgeting should be included in Unit 1
 - the topics Probability and Relative Frequencies or Earth Geometry (p.3) should be replaced with a topic that deals with Taxation. Students are more likely to be engaged in relevant learning in topics about taxation, accounts, and superannuation.

5.3 Key Issues in Mathematics – Achievement Standards

- There is insufficient differentiation between the grades. The description of the achievement standards should include the use of qualifiers (adverbs) to assist in differentiating the grades.
- The rationale given as to why the number of descriptors at the D and E grades differs to those at the A and C grades, is not convincing. The D and E grades should include as many descriptors as the grades A to C.
- The description of a C reads as if students will not make any errors. However, some errors, which show an acceptable level of reasoning, should be allowed for.
- There are too many dichotomies presented to describe mathematical problems: 'standard/non-standard', 'routine/non-routine', 'familiar', and 'simple'. The term 'familiar' is ambiguous, and should not be used. The terms should be simplified and defined. In South Australia the terms 'complex' and 'routine' (where 'complex' is used to denote a higher-order question than 'routine') are used to describe mathematical problems.
- There is a lack of clarity about key words used in the achievement standards. Some examples include:
 - The distinction between 'mathematical' and 'statistical', which is not useful.
 - In the Reasoning and Communication dimension, clear definitions are required for such words as: 'interprets', 'analyses', 'analyses and interprets', and 'evaluates'.
- Examples are needed of what is meant by the term 'inter-relatedness' (p. 15).
- The SACE Board does not support the inclusion of content in the achievement standards. For example, the inclusion of specific content in the descriptions (sub-points), 'in algebra, functions, graphs, calculus, probability and statistics' may unnecessarily exclude students from achieving highly.

5.4 Additional Advice on Design and Structure of Achievement Standards in Mathematics

Specialist Mathematics

- There is lack of consistency in some of the descriptors. For example,
 - Concepts and Techniques CT1 – In Units 3 and 4, only the A grade has ‘to solve problems...’. This should be added to the B, C, and D grades.
 - CT2 – Units 3 and 4 have lost some key words (‘non-routine’ and ‘effectively’ at A grade) from Units 1 and 2, and therefore appear to have a reduced requirement.
 - The variation in the use of verbs across Reasoning and Communication RC3 and RC4, especially when compared to Mathematical Methods:
 - RC3 – analyses and interprets (A grade); analyses (B); analyses... familiar problems (C); recognises (D).
 - RC4 – analyses and interprets...comprehensive (A); analyses (B); analyses ...standard problems (C); not evident at D and E levels.
- Some terms are ambiguous. For example, RC5 – at A and B grades the description relates to ‘**any** models’. At C level, the descriptor becomes ‘**any** mathematical or statistical models’. The issue here is the ambiguity of the word ‘any’ (to clarify if it means ‘whatever model’ or ‘all models’).

Mathematical Methods

- It is an expectation that the achievement standards for the two subjects, Specialist Mathematics and Mathematical Methods, should be similar in structure, as the students who are studying Specialist Mathematics are likely to be studying Mathematical Methods as well. There is too much variation in the use of verbs across RC3, especially when compared to Specialist Mathematics.
- RC2 – this is a multi-faceted descriptor that would be hard to use because of its complexity. The quantity of elements in this descriptor should be reduced.
- There is insufficient clarity between the grades. Some examples are:
 - There does not appear to be a strong reason for the differentiation in the use of verbs between the units for RC3:
 - RC3 (Units 1 and 2) – evaluates and interprets results with comprehensive consideration (A); analyses results with comprehensive consideration (B); analyses results with consideration (C);
 - RC3 (Units 3 and 4) – evaluates and interprets results with comprehensive consideration (A); evaluates results with consideration (B); evaluates results with consideration (no reference to validity; limitations only) (C); recognises results and solutions to routine problems (D).
- RC5 – The verbs are problematic, and there is insufficient differentiation between the grades: evaluates and communicates (A); describes (B); recognises ...different (C); recognises (D).
- Some terms are ambiguous. For example, RC4 – ‘communicates observations, judgments and decisions which are succinct, clear, reasoned, and evidenced using appropriate mathematical and statistical language’ (A). Clarification is needed about whether the ‘observations, judgments and decisions’ themselves

need to be 'clear and succinct', or the communication of the observations, judgments and decisions, needs to be 'clear and succinct'.

- Some of the grade levels are pitched too high. For example:
 - RC1 - 'synthesises mathematical techniques'. The verb 'synthesises' is too challenging and should be replaced.
 - The D level is pitched too high. Students who are able 'to interpret the reasonableness of results' are working above the D level. So too students who are able to recognise 'results of the use of any mathematical or statistical model'. (p.14)

General Mathematics

- These achievement standards have a better flow of language through the grades than Special Mathematics and Mathematical Methods.
- Some grade levels are pitched too high. For example:
 - 'synthesis' is a too high-order descriptor, given the nature of the cohort for this subject, and should be replaced.
 - RC3 – In Units 1 and 2 the requirement to evaluate**all** problems at the A level will exclude many high-achieving students who make occasional errors. 'All' should be deleted.
- There is an need for consistency in the descriptors. For example:
 - RC5 – In Units 3 and 4 the A and B descriptors are identical, and should be differentiated.
 - RC1 – The wording 'ideas from mathematics and statistics' changes to 'mathematical models and statistical information and ideas' after the A level, and should be made consistent.

Essential Mathematics

- There is a need to make distinctions between the grades, for example, RC5 – in Units 3 and 4 the A and B descriptors are identical, and should be differentiated.
- Some grade levels are pitched too high. For example, RC3 – in Units 3 and 4 the expectation at the C level to work within 'diverse mathematical and statistical information' is a high demand for this group of students, and should be qualified.

6. SUBJECT-SPECIFIC ADVICE AND RECOMMENDATIONS – ENGLISH

6.1 Key Issues in English – Content

Reduction in Content

The presentation of the content is problematic. In Literature and English some of the sub-points are substantial pieces of work in themselves, and should be presented as examples only.

Quality of Content

The approach to reading of text does not appear to value the agency of the reader, for example to challenge or resist the author's purpose; this should be more evident through the content.

Text lists

The range of texts in the sample text lists should be extended, and differentiated between Units 1 and 2, and Units 3 and 4.

6.2 Additional Advice on Design and Structure of Content in English

Literature

Reduction in Content

- The presentation of the content is problematic. Some of the sub-points, such as 'digital storytelling' (p.6), are substantial when they are unpacked. For example, in Unit 3 there is potentially a huge workload with 'the relationship between significant historical and cultural events and figures' (p.10), when looking at detail of what texts to select, along with 'critiquing the ways in which language, structural and stylistic choices communicate values and attitudes and shed new light on familiar ideas', and 'the interplay of the visual and verbal' (p.10).
- Defining 'a range of critical perspectives' (p.1) – the extent to which this refers to the student's personal interpretation as well as how other critical perspectives inform the student's own.

Quality of Content

- The scope of 'the way in which adaptations of earlier texts allow new insights into original texts', and 'the ways in which aspects of literary texts have been appropriated into popular culture' (p.6), which could lead to a lot of film viewing.

English

Reduction in Content

- The presentation of the content is problematic. Some of the sub-points are substantial when unpacked. For example:
 - Unit 2: 'how responses to texts and genres may change over time' would almost be a unit in itself and quite complex for Year 11 students. (p.11)
 - Unit 3: 'how audiences have developed expectations of genres ...' (p.11)
 - Unit 4: 'identifying omissions, inclusions, emphases and marginalisations' (p.13) could be a whole learning program.

English as an Additional Language or Dialect

Role of Literature

- The place of literature in this subject is problematic. It is important that literature is represented as only one useful component of the EAL/D curriculum, and not a central focus. In this way the EAL/D curriculum can represent best practice in EAL/D teaching rather than appearing as a modified version of an English literature subject. The conception of literature should be broadened to encompass a wider range of text types and contexts of relevance to the student cohort.

Quality of content

- The amount of content in each Unit is too great. Each unit should be reassessed so that it contains an appropriate amount of content for one semester, taking into consideration the likely needs of students and taking into consideration the kinds of skills described in the Language Table. This includes consideration of the

number of points in the content, as well as the type and number of ideas in each point.

- The level of specificity of the content is quite varied, with some points being confusing because they lack detail and clarity, while others would not be applicable to different student cohorts or contexts because they are overly specific.

Essential English

Reduction in Content

- The presentation of the content is problematic. Some of the sub-points are substantial when they are unpacked. For example: 'the representation of contrasting values and attitudes in the interplay between narrative points of view and authorial perspective' (p.9) contains too many elements.

Quality of Content

- Comprehension strategies and research (literacy-based strategies) are not effective as content organisers, and should be presented only as strategies.
- The significant emphasis on research skills (e.g. 'categorising and analysing information', p.9) is too extensive in the Essential English content. The research should be contained and more tightly linked to work on text and communication, leading into language and textual analysis.

6.3 Key Issues in English – Achievement Standards

- Achievement standards in all English subjects require further work, to make the levels of cognitive demand placed on students more nuanced and clear. It is difficult to make an assessment decision on some of the achievement standard levels. The different grade descriptors do not seem to be comparing levels of performance with one another, but rather seem to require different evidence (and thus different assessment tasks) for each level.
- The descriptors are not clear about students are expected to do. For example, there can be a range within evaluation, so degrees of achievement should be reflected. There is more discrimination in the 'Responding to' dimension, but it is still difficult to see the quality of how well students have shown what they can do. The descriptors are mainly yes/no in nature, rather than to what degree.
- There is a lack of consistency in the progression from A to E. For example, in English, how 'shaped' and 'influenced' would be different (A to B), or 'represented' at A, and 'presented' at B. Similarly, why in Unit 3 and Unit 4, 'perspective' is used in the A level descriptor and 'point of view' in B. They imply teaching different kinds of content.

7. SUBJECT-SPECIFIC ADVICE AND RECOMMENDATIONS – HISTORY

7.1 Key Issues in History – Content

Quality of Content

- The Cross-curriculum Priorities should be much more evident in the content:
 - *Aboriginal and Torres Strait Islander histories and cultures* in both Ancient and Modern History.

- *Sustainability* in Modern History (social, political and economic sustainability).
- All the cross-curriculum priorities appear only in the electives. There is insufficient flow through in both Ancient and Modern History.
- In Ancient History, 'Asia and Australia's engagement with Asia' is only referenced to China. The Cross-curriculum Priorities claim to specifically cover Aboriginal and Torres Strait Islander cultures and histories, but this is not evident.
- Ethical behaviour focuses more on empathy, and does not include student agency in behaving ethically, or ethical conduct of student research. As it is a general capability, the focus should be on students developing their ethical behaviour, rather than a passive study of the behaviour of others.
- Historical skills need to be made more visible, and presented in a consistent way. The structure and amount of content does not allow sufficient time to be spent on the development of historical skills.
- Although the options for study are appreciated, some of the content coverage remains limited. For example:
 - There is a striking lack of representation of women throughout both the Ancient and Modern History content. For example, in 'The Changing World Order' in Unit 4, the significant individuals are all men, with no reference to key world figures such as Margaret Thatcher, Indira Gandhi, or Golda Meir. Similarly, Golda Meir is not mentioned in the topic 'The Struggle for Peace in the Middle East'.
 - There is insufficient mention of Africa in Modern History, or of Africa and South America in Ancient History, which is in contrast to the diversity of the student cohort. Options could be provided for focus within topics, for more inclusive studies.
 - There are insufficient options for topics to 'build students' understanding of the contemporary world'. Possible examples include the Cuban or Iranian revolutions.
 - Ancient History is very Mediterranean focused, with inadequate reference to Aboriginal and Torres Strait Islander histories and cultures, or to Asia, Africa, or South America. There is limited mention of social aspects, with insufficient emphasis on knowledge of society and the part that literature has to play in representing society.
- A thread of Australian History is needed throughout the Modern History document, not just in parts. There are elements in Units 2, 3, and 4, and Unit 1 allows a focus on an open topic. However, at least half the time would not be spent on Australia, as the content is currently structured. There could be a stronger Australian focus, for example, in 'Movements for Change' or the 'Civil Rights Movement'. There could also be more emphasis on Australia's neighbours, such as East Timor.

7.2 Additional Advice on Design and Structure of Content in History

Modern History

Quality of Content

- The rationale and aims are coherent, and the structure has improved, in terms of the number of topics. There is scope for Units 3 and 4 to be more cognitively demanding than Units 1 and 2, and there is a distinct difference in terms of outcomes.

- More flexibility is required in the choice of topics. For example, in Unit 2, an option in topic electives to include other social movements, such as environmental or peace, would allow this flexibility.
- There is a need to be more inclusive in the topic choices. For example:
 - Adding reference in Unit 2 to South Africa and Apartheid. There is so much more to civil rights both within and outside Australia than just the United States civil rights movement.
 - In the topics on Women's Rights and Workers' Rights (pp.12, 15) it would be more inclusive and relevant to students to refer to 'Australia and one other society' rather than 'one other Western society'. This would allow teachers and students from culturally and linguistically diverse communities to bring their own knowledge to enrich the learning process.
- Previous advice on the time span for Australian History, given at videoconference in March, has not been taken up (it should at least start from 1901, or from the beginning of the war, not 1916); nor was advice on adding more references to Indochina and Britain incorporated.
- Unit 4 is less engaging. Teachers would look at how topics from Unit 3 could be merged with Unit 4 to maintain student interest.
- An error needs correcting on p.15. It is the *Industrial Workers of the World* (the 'Wobblies') that was founded in 1905, not the International Workers of the World, which is an anarchosyndicalist collective.

Ancient History

Quality of Content

- The rationale does not flow through to the content; for example, in looking at a range of sources besides physical ones. There should be more reference to literature as a historical source.
- The subject is content-driven rather than teaching skills and building the content around them. The volume of content will be at the expense of developing skills.
- The first draft was very focused on archaeology, but that has now been significantly reduced. Learning from different types of sources should be a key focus, with scope for engaging activities such as a 'mock dig'.
- In Unit 1, the reference to 'controversy' in relation to interpretation and representation of ancient sites should be illustrated by examples.
- In Unit 3, it would be very engaging for students to have a comparison between Athens and Sparta – to communicate that they were opposites, rather than presenting Archaic Greece as a 'country'.
- It is not clear why only one woman is suggested in the list of individuals for study (p. 31). The list of people alongside 'Greece' is limited, as is the list of ancient sites and developments on p.34, with no mention of Asia or Australia.
- In Unit 4, Sophocles and Euripides should be added to the list of sources.

7.3 Key Issues in History – Achievement Standards

- The D and E grades should include as many descriptors as the grades A to C. There could be reference to 'recognises and interpretation and/or representation' in the E descriptor, for example, without resorting to negative wording.
- The verbs need some adverbs to identify how well students (for example) explain (i.e. in depth, not superficially). These qualifiers are evident in the lists of historical skills. Why is 'explains' used at A, B, and C with reference to 'key movements and developments'?
- Overall, the achievement standards are insufficiently distinctive. There should be more differentiation between the grade levels than just one or two words. There is too much similarity between the sub-points across the different levels for the achievement standards to appropriately differentiate evidence of learning.
- In Modern History, 'describes' is too low level for a C. 'identifies consequences' at D and 'identifies some consequences' at E is at too high a level. To identify consequences requires some analysis, which is at least at a C level. There should be more reference to analysis in the standards for Units 1 and 2. Overall, there is insufficient focus on 'analysis' in the achievement standards.

The D descriptors still require quite a bit of work. However, there is some better differentiation between C, D, and E under 'Skills'.

- In Ancient History, there is insufficient alignment between the content, historical skills, and the achievement standards.
- The ability to use the metalanguage for the study of Ancient History, evident in the Year 10 curriculum, is missing from the senior secondary achievement standards.
- There is some overweighting of interpretation of sources under 'Skills' in Ancient History – there is a lot more substance in both Ancient and Modern History under 'Historical Skills' than is covered in the achievement standards.

7.4 Additional Advice on Design and Structure of Achievement Standards in History

Modern History

- The achievement standards are insufficiently distinctive. For example:
 - The first sub-point under 'Knowledge and understanding' does not have enough differentiation between A, B, and C, beyond just 'significance of'. The absence of 'in different times and places' at the C is unhelpful – it is the study of history so must relate to different times and places.
 - It is not clear why historiography is emphasised more in the achievement standards for Units 1 and 2 compared to Units 3 and 4.
 - 'analysing significance' in the last sub-point under 'Knowledge and understanding' is a skill, which is covered in the first sub-point under 'Skills'.
 - The first sub-point under 'Skills' at the C level does not indicate what students do with their research.

Ancient History

- The achievement standards are insufficiently distinctive. For example:
 - In Units 3 and 4, there is some critical analysis at the A, but still some reference to 'explains', which can be interpreted at a more basic level.
 - There is no differentiation between the B and C in the last sub-point under 'Skills'.

- Expression and structure seem to have a lower emphasis under skills. In the final sub-point, 'evidence' has already been covered, so could be replaced by reference to 'appropriate structures'.
- There should be more emphasis on the quality of communication, as well as the evidence and referencing.