

**INTERNATIONAL COMPARATIVE STUDY: THE
AUSTRALIAN CURRICULUM AND THE BRITISH
COLUMBIA NEW CURRICULUM**

acara AUSTRALIAN CURRICULUM,
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Australian
CURRICULUM

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EXECUTIVE SUMMARY

This paper reports on the findings of a study comparing the Australian Curriculum (AC) with British Columbia's New Curriculum (BCC). The study is the first in a series of international comparisons with curricula of high-performing countries and systems; these comparisons are a component of the Curriculum business unit's ongoing program of research, as specified in the Australian Curriculum, Assessment and Reporting Authority (ACARA) 2017–2020 work plan. The comparative studies will contribute to the long-term consideration of international developments in curriculum design and are intended to elicit observations that will inform the next generation of the AC. It is not the purpose of the studies to make judgements regarding the quality or effectiveness of the overall provision of education in any jurisdiction.

The selection of British Columbia for this first comparative study is based on the key criterion stipulated for the research project. British Columbia, a Canadian province, is a sovereign education system that is among the top performers in international student assessments.

Further, British Columbia is highly regarded for its innovative approach to curriculum design, with a new curriculum produced within the last decade and to some extent in parallel with the development of the AC. As is true of Australia, British Columbia collaborates on international projects focusing on educational research and curriculum design.

This research project takes place in a climate of increasing international competitiveness regarding student performance in assessment programs such as the Programme for International Student Assessment (PISA), Trends in International Mathematics and Science Study (TIMSS) and Progress in International Reading Literacy Study (PIRLS), together with expressions of concern about the capacity of school curricula to prepare students for the post-school world of the 21st century.

Contemporary comparative education research emphasises careful consideration of the local context in which curriculum is developed, rejecting any notion of an easy transfer of design or practice from systems that are judged to produce superior outcomes. A review of the literature relating to comparative education research underpins the methodological approach adopted for these international comparative studies (ACARA, 2017a). In this first comparative study, a mixed-methods approach enables a comprehensive picture of the basis for curriculum design in the two jurisdictions. Complementing the demographic and other contextual comparisons, ten small studies reveal the professional judgement of ACARA's Curriculum Specialists in their analysis of the content and expectations of the two curricula. Drawing on Webb's Depth of Knowledge schema, this work includes careful evaluation of breadth, depth and rigour across learning areas.

This comparative study is based on the *Australian Curriculum Version 8.3* (ACARA, 2016a), the *British Columbia Curriculum Grades K-9* for implementation 2016/17 (BCME, 2015a), and the *British Columbia Curriculum Grade 10* (draft) for implementation 2018/19 (BCME, 2015b).

Comparison of the AC with CBCC reveals strong similarity between the two documents in relation to intent, design and content. Both curricula are multi-dimensional in structure, identifying disciplines and competencies as key elements of learning. The AC and BCC both

aim to provide a flexible and accessible suite of intentions and materials to improve the learning of all young people.

This study reveals a high degree of consistency across the subject areas and year levels in relation to breadth in the AC, with some variability for the BCC. There is more variability across the AC and BCC in relation to depth and rigour.

Findings of particular interest in this comparative study are as follows:

Flexibility of the curriculum

The redesign of the BCC is based on a commitment to greater flexibility for teachers and students to pursue their interests. Considerable responsibility rests with classroom practitioners to make professional decisions regarding breadth, depth and rigour in their programming, including the allocation of time to teaching the various disciplines.

Prescription and volume of content

The BCC is a concept-driven instrument that asks educators to focus on Core Competencies, with a reduced emphasis on prescribed content and pedagogical direction. In contrast, the AC is considerably more prescriptive and detailed in relation to disciplinary content.

Student agency and engagement

The intended audiences clearly inform the nature and purpose of the curriculum. British Columbia places students at the centre of the curriculum, speaking directly to them and making them accountable for their own learning; the first person is used in much of the material. In contrast, the AC states explicitly that the document is written for teachers.

Integration of indigenous perspectives

In the case of BC, Aboriginal Perspectives and Knowledge is an area of influence across all learning areas and there is a comprehensive focus on First Peoples Principles of Learning across the curriculum. Similarly, one of the three Cross-Curriculum Priorities of the AC is Aboriginal and Torres Strait Islander Histories and Cultures; these perspectives are not represented as strongly in the AC.

Competency-based learning

While there is a stated commitment in the AC to preparing students for life and work in the 21st century, and a set of General Capabilities is provided to enable this, these are not as strongly positioned in the AC as they are in the BCC's Core Competencies.

Personalisation of learning

As is true of the AC, a strong commitment to equity and diversity underpins the design of BC's New Curriculum. In what is referred to as a 'transformation' in curriculum design, the focus is on helping students to develop the skills and competencies they need for success through a personalised approach to learning that emphasises choice.

This comparative study considers the design and content of curricula from a country and a province that are arguably more similar than different in their aspirations for their young learners. It is clear from the detailed analyses of the various learning areas and other

dimensions that the two curricula also share the reality that a school curriculum represents just one – albeit critical – element of the learning experience of a student in the 21st century.

1. PROGRAM OF RESEARCH

One highly visible trend in education around the world is the focus on redesigning school curricula to enable students to prepare for work and life in the 21st century.

School authorities and other decision-makers are encouraging innovative review and rethinking of school curricula, with input sought from a wide range of stakeholders, including parent and professional associations, industry and employer bodies and a range of special-interest groups. Amid escalating interest in international comparisons of the performance of education systems over past decades, nations and jurisdictions increasingly aspire to the creation and delivery of curricula that merit the description of ‘world-class’ (Donnelly & Wiltshire, 2014; Denman & Higuchi, 2013; Hebert, 2012; Schleicher, 2009).

In Australia, discussion about curriculum content and design tends to be framed by perceptions of a decline in traditional academic standards of both content and teaching, accompanied by a sense of urgency to address issues of equity, access and diversity.

The AC, now being implemented in its first iteration, has a three-dimensional structure that attracts international interest regarding its capacity to meet the needs of all learners in an increasingly challenging world.

ACARA is undertaking a program of research that considers international trends and developments in curriculum design, including the projects to which Australia contributes, such as the Organisation for Economic Co-operation and Development (OECD) Education 2030 Project and the International Bureau of Education - United Nations Educational, Scientific and Cultural Organisation (IBE-UNESCO) Global Curriculum Network. The question guiding ACARA’s research is universal: *What should students learn?*

1.1. Background

With specific regard to the AC, ACARA’s strategic directions, endorsed by the Council of Australian Government (COAG) Education Council in November 2016, are to:

- Provide a world-class curriculum from Foundation to Year 12 in specified learning areas agreed to by Council
- Assemble the evidence base required to review, develop and refine curriculum.

ACARA’s quadrennial work plan (2016/17 to 2019/20) approved by the Education Council in 2015 includes development of a program of research to review and report on recent developments in international curriculum practice to inform national policy and practice and to improve the Australian Curriculum.

1.2. Methodology

Comparative education research has a lengthy and wide-ranging history. A review of the literature (ACARA, 2017a) in the field of international comparative studies reveals a shift in emphasis from large-scale quantitative data analyses to more nuanced qualitative research methods and underpins the methodological choices made in this program of research. Over the past thirty years, according to Epstein (2008, p. 377), two opposing epistemologies have characterised comparative education research, which he names as “the universalism of

positivism and the particularism of relativism”. A consensus appears to be building among contemporary researchers that a mixed-methods approach to comparative studies is more likely to allow “more comprehensive analysis of the external and internal factors that shape policy making and education systems” (Chong & Graham, 2013, p. 2).

This international comparative study uses a mixed-methods research design incorporating philosophical and pedagogical assumptions as well as methods of inquiry. As a methodology, it draws on philosophical assumptions that guide the direction of the collection and analysis of data and the mix of qualitative and quantitative data in a series of studies. It seeks to use quantitative and qualitative approaches in combination to provide a better understanding of the research objectives (Creswell & Plano Clark, 2007, p. 5).

The study comprises ten smaller studies of comparison between the AC and the BCC. The ten studies encompass the eight learning areas identified in the AC. All learning areas applicable to the two curricula were counted in the study, as shown in the following table.

Table 1.1 *Subject areas by country*

Australian Curriculum	British Columbia’s New Curriculum
English	English Language Arts
Mathematics	Mathematics
Science	Science
Humanities and Social Science: History, Geography, Civics and Citizenship, Economics & Business (Year 10 only)	Social Studies
The Arts (Dance, Drama, Media Arts, Music, Visual Arts)	Arts Education
Design & Technologies Digital Technologies	Applied Design, Skills and Technologies
Health and Physical Education	Physical and Health Education
Italian*	Italian*
<p>NOTE: As a point of departure, British Columbia offers Career Education from Kindergarten to Grade 12. Since the AC does not have a comparable knowledge base, a comparative analysis was not attempted.</p> <p>* Initially, the study called for comparison using four languages: French, Chinese, Italian and AUSLAN. It was subsequently agreed to focus on Italian as a representative sample.</p>	

A further study was conducted using the AC’s *General Capabilities* and BCC’s *Core Competencies*. The AC promotes seven General Capabilities; BC’s New Curriculum acknowledges three Core Competencies in every learning area.

The final study considered the AC’s Cross-Curriculum Priority – Aboriginal and Torres Strait Islander Histories and Cultures alongside the Aboriginal Perspectives and Knowledge component of BC’s New Curriculum.

ACARA’s Curriculum Specialists undertook the comparisons of the learning areas and other dimensions.

Methodological Tensions and Measurement

Determining curricular breadth and depth is integral to curriculum design and this has been the source of “premature polarities” (Hirsch, 2001a,b). Hirsch also posits that a deep understanding depends on broad knowledge, emphasising that “not just any knowledge will suffice”. In determining breadth and depth, a curriculum is likely to privilege one over the other.

The aim of this study is to make comparisons between the AC and the comparison curriculum with respect to breadth, depth and rigour. The study uses a three-level taxonomy to determine curricular breadth and depth. The terminology used to describe curricular breadth and depth is informed by the National Highway Traffic Safety Administration: National Emergency Medical Services Education Standards (2009) and Masters (2015).

Calculating Breadth and Depth

Breadth refers to the number or range of topics or content covered in the curriculum. The terminology used to describe breadth is *limited*, *fundamental* and *challenging*.

Breadth	
Terminology	Explanation
Limited	Elementary, modest, unembellished
Fundamental	Building on basic breadth to expand knowledge
Comprehensive	Comprising multiple items; wide scope; full range

Depth refers to the amount or level of detail about a body of knowledge or topic that can lead to the development of deep understandings of key concepts, principles and knowledge and the ability to apply these understandings to authentic, or ‘real-world’, contexts. The terminology used to describe depth is *limited*, *fundamental* and *challenging*.

Depth	
Terminology	Explanation
Limited	Elementary, rudimentary
Fundamental	A leading or primary principle, which is fundamental to system/body of knowledge; essential part
Challenging	Integrates, interconnects; a composite of knowledge; requires higher-order thinking

Calculating Cognitive Demand

Following the broad acceptance of Bloom's (1956) work, various attempts at developing schemas to describe cognitive demand in different learning and assessment contexts have included the National Assessment Governing Board's National Assessment of Educational Progress (NAEP) (2005) frameworks for assessing mathematical complexity of items based on demand on thinking and Norman Webb's *Depth of Knowledge* (1997).

Webb's tool is designed to help teachers create rich environments where all students can learn at a high level. Depth of Knowledge (DoK) categorises tasks according to the complexity of thinking required to successfully complete them.

Level 1: Recall and Reproduction

At this level, a student exerts little cognitive effort beyond recall or memorisation. Typical tasks are: copying, computing, defining, and recognising.

Level 2: Skills and Concepts

At this level, a student makes some decisions about learning. Typical tasks are: comparing, organising, summarising, predicting, and estimating.

Level 3: Strategic Thinking

At this level of complexity, a student uses planning and evidence, justifies choices and thinking is more abstract. Typical tasks involve solving non-routine problems, designing an experiment, or analysing characteristics of a genre.

Level 4: Extended Thinking

This level requires the most complex cognitive effort. A student synthesises information from multiple sources, often over an extended period, or transfers knowledge from one domain to solve problems in another. Examples might include designing a survey and interpreting the results, analysing multiple texts to extract themes, or writing a sophisticated, original text.

It must be noted that:

- levels are *not* considered a progression
- levels are *not* sequential
- levels are *not* developmental.

Webb's (1999) work has been applied mainly to different content areas and test item development in the United States, as well as being used in the determination of alignment between state standards and tests used for purposes of accountability.

Measuring Rigour

For the purposes of this comparative study, an understanding of *rigour* assumes the following:

- standards and expectations are high and known to all students
- assessments are comprehensive and aligned to learning standards

- focus is both on content and higher order activities
- student work is assessed both by the classroom teacher and external experts.

The schema provided in Table 1.2 is based on Webb's *Depth of Knowledge* (DoK). It is designed to provide a common language and shared methodology to make evidence-based and on-balance judgements about the level of rigour in the AC and any comparative curriculum.

With consideration of rating scales used in similar work, the schema employs a three-point scale to measure a curriculum's capacity to:

1. engender in-depth (mastery) learning across the years of schooling in a coherent and sequential manner, and
2. provide opportunities for cognitive and intellectual challenge that moves students into deeper and broader engagement with a learning area.

At limited, moderate or challenging levels, a curriculum will reflect:

- Content knowledge and skills a student is expected to demonstrate (equivalent to Content Descriptions/Elaborations; Achievement or Learning Standards)
- Cognitive demand placed on the student by the curriculum to accomplish tasks (equivalent to Creative and Critical Thinking).

The schema should not be considered a progression. Rather, it is a framework for gauging (1) a student's depth of understanding of the content, including acquisition of skills aligned to the expectations of a jurisdiction's curriculum, and (2) the level or variance of cognitive demand placed on a student by the curriculum learning area. The following table represents a schema developed from Webb's DoK.

Table 1.2 *Schema developed from Webb's Depth of Knowledge*

Limited	Moderate	Challenging
Relies on memorisation and recall (e.g. recognition of previously learned concepts and principles)	Involves flexibility of thinking and choice in developing skills and concepts (e.g. comparing, applying, classifying, describing, explaining)	Places considerable demand on students' ability to engage in abstract thinking and reasoning (research, planning, analysis, investigation, use of judgement, application of critical, creative and collaborative skills to solve problems and apply solutions to real world issues)
Teacher actions		
Questions to direct or focus attention; shows/tells/demonstrates; provides examples; examines; leads, breaks down (deconstructs); defines	Questions to differentiate, infer, or check conceptual understanding; models; organises/reorganises/explores possible options or connections; provides examples	Questions to probe reasoning and underlying thinking; asks open-ended questions; acts as resource/coach; provides criteria and examples for making judgements and supporting claims; encourages multiple approaches and solutions
Student actions		
Responds, remembers, memorises, restates, absorbs, describes, demonstrates, follows directions, applies routine processes, definitions, procedures	Solves routine problems/tasks involving multiple decision points and concepts; constructs models to show relationships; demonstrates use of conceptual knowledge; compiles and organises; illustrates/explains with examples /models	Uncovers and selects relevant and credible supporting evidence; analyses, critiques, debates, judgements; plans, initiates questions, disputes, argues, tests ideas/solutions; sustains inquiry into topics or deeper problems
Examples of student product		
Show and tell Locate or recall quotes Document information/cite sources Brainstorm related ideas Represent math relationships in words, pictures, or symbols Write complete sentences Fill-in-the-blank tasks Recite math facts, poems, etc	Graphic organiser Mind map Blog entries Timeline Demonstration (e.g. sports) Diary entry (English, Art) Narrative writing Spreadsheet Survey development Science/Mathematics logs Venn diagram	Complex graphing, Vodcast or podcast, Analyse survey results. Debate/argue from given perspective, Multiple paragraph essay or extended response, including research and analysis Literary critique, play, book, music or film review, Information report (may be multimodal), Science experiment report (may be multimodal), Storyboard for film/cartoon animation

Source: Hess, K. (2013). *A Guide for Using Webb's Depth of Knowledge with Common Core State Standards*. Common Core Institute.

Based on this schema, a template was developed to map curricular *breadth*, *depth* and *rigour*, as can be seen in the smaller studies included in this paper, enabling judgements about the eight learning areas and two other dimensions of the comparative curricula.

2. CONTEXTUAL DESCRIPTION AND ANALYSIS

2.1. Preamble

As education systems around the world grapple with the challenge of preparing students for work and life in the 21st century, their efforts have invariably led to consideration of curriculum at the system and/or school level. They have also, according to Fadel (2014), generally resulted in making existing curricula more robust and rigorous rather than redesigning learning in innovative, skills-based ways.

Fadel's (2014) assertion, mirrored in the research underlying the OECD's Education 2030 Project (OECD, 2017a), is that the rapid rise in the rate of global systemic change has created "an increasingly volatile, uncertain, complex, ambiguous (VUCA) world and thus is significantly more unpredictable". For students to function successfully in a rapidly changing world, it is now recognised that they will need to be able to "find solutions to complex social and environmental problems". It follows that they will need to "develop higher-order thinking skills, social intelligence, the ability to work with diverse groups of people and a commitment to lifelong learning (PricewaterhouseCoopers, 2017).

The IBE-UNESCO Global Curriculum Network project pursues similar lines of investigation into educational developments and practices around the world. A recently released discussion paper argues for a new approach to curriculum design (UNESCO, 2017), exploring the view that rethinking and repositioning curriculum in the 21st century demands a global change in basic assumptions. The discussion seeks to redefine curriculum as a multi-modal, multi-dimensional and complex continuum that must take account of a fourth industrial revolution; that is, students are learning in a world that is rapidly shifting from a focus on the acquisition of knowledge to one that is driven by access to and the use of technology to enable the application of knowledge.

In this view, the traditional, triangulated relationship between teaching, learning and assessment represents a limiting and limited proposition. Future curriculum design must be shaped and informed by a proactive objective, where curriculum is "an agent of change rather than just a reactor to change" (UNESCO, 2017, p 4).

Australian research supports the notion that a 21st century curriculum should encourage students to prepare for post-school lives that are likely to span a range of occupations, many of which do not yet exist (Masters, 2015). Such a curriculum should privilege:

- deep understandings of subject matter and the ability to apply what is learnt
- the ability to communicate and solve problems in teams
- the ability to think critically and to create novel solutions
- flexibility, openness to change and a willingness to learn continually (Masters, 2015).

Consistent with OECD research on 21st century skills, Masters (2015) posits that an effective school curriculum prioritises depth over breadth of learning.

What is the appropriate balance between breadth and depth? There is evidence that school curricula tend to be 'crowded' with content that teachers are expected to cover. This is a major focus of the OECD Education 2030 Project, as researchers and educators attempt to

address the concerns coming from the field regarding the density of content and the temptation among teachers to ‘tick off’ items they have taught rather than aspire to providing students with deep learning in fewer areas (Masters, 2015). Efforts to provide students with some knowledge about a wide range of topics can lead to what is sometimes referred to as ‘mile-wide, inch-deep’ curriculum. Although the mastery of factual and procedural knowledge is privileged in disciplines offered in schools around the world, research suggests that this knowledge should be organised around core concepts or Big Ideas (Bransford, Brown & Cocking, 1999).

Over the last decade, both Australia and the Canadian province of British Columbia have engaged in an extensive review of curriculum, involving broad consultation with stakeholders and the engagement of national and international experts.

Australia has developed its first truly national curriculum, a three-dimensional model that identifies learning areas and subject disciplines, General Capabilities and Cross-Curriculum Priorities.

In British Columbia, the new curriculum model bases learning on Big Ideas and is considerably less prescriptive with respect to learning content than its counterparts around the world, including the AC.

2.2. Demographic comparison: Australia and British Columbia

This section provides broad demographic information to assist in understanding the context of curriculum development in British Columbia and Australia. British Columbia’s status as a province of Canada means that this cannot be a straightforward country-to-country comparison; rather, demographic details applicable to both the province and the nation are offered as they can be compared to those relevant to Australia. The material paints a broader picture of the societies into which young Australian and Canadian learners are being born.

In addition to their students’ consistent performance above OECD averages in international assessments, Australia and Canada have many demographic and socio-cultural characteristics in common. Both countries occupy a very large land mass, with significant geographical dispersion of the population. Both countries also have a very diverse population in terms of indigenous peoples, migrant intake and languages spoken at home. As former colonies of Great Britain, their socio-political origins are very similar; both countries have developed a federalist, Westminster-style system of parliamentary government and are generally classed as liberal, Western democracies. Both are members of the Commonwealth of Nations (formerly the British Commonwealth) and both are English-speaking countries, although British Columbia – like the rest of Canada – offers French as a core subject within the general provision of school education.

Responsibility for education

The governance of education, however, is quite different. In Australia, the six state and two territory governments have constitutional responsibility for delivery of school education, and they fund their public school systems. The Commonwealth Department of Education and Training is responsible for national policies and programs and provides over half of all funding in the Catholic sector and almost a third of total funding in the Independent sector (Australian Government Department of Education and Training (AGDET), 2015).

Schooling in Canada is completely decentralised. It is the only country in the developed world that does not have a federal office or department of education and has no integrated national system education (Council of Ministers of Education (CMEC), 2017). Responsibility for education sits with each of the ten provinces and three territories and responsibility within the provinces is divided between the central provincial government and locally elected school boards. The Council of Ministers of Education, Canada comprises the heads of the provincial ministries of education and is largely a cooperative body for the provinces.

Population

Australia and Canada are both very large countries in terms of area, ranking sixth and second in the world by total area, respectively. Their relatively low populations in international rankings (51st and 38th) also mean low population density, and in both countries, this has a range of implications for students living in urban, regional and remote areas. Both countries have high geographical concentration in certain parts of the country, particularly as people continue to gravitate towards large metropolitan areas.

In Australia, 82% of the population lived in a Greater Capital City in 2016 (Australian Bureau of Statistics (ABS), 2017a). Statistics Canada (2017a) reports that in 2016 71% of Canadians lived in a Census Metropolitan Area. Two-thirds of the population was estimated to live in an area representing just 4% of Canada's total territory and within 100 kilometres of the southern Canada-United States border.

In British Columbia, 2.46 million people, making up 53% of the total population, live in the Metro Vancouver area (Statistics Canada, 2017a).

Consequently, while most students in both locations will be educated in a metropolitan context, which allows some concentration of resources, the challenges associated with distance are issues affecting educational opportunity for a relatively small proportion of Australian and Canadian students. In both countries, there is a disproportionate impact on the education of indigenous students.

Table 2. 1 *Key population measures*

	Australia	Canada	British Columbia
Population	24,403,400 ¹	35,151,728 ²	4,648,055 ²
Area (km ²)	7,692,024	9,984,670	944,735
Average people per square kilometre	3.17	3.52	4.92
Average annual population growth 2011-2016	1.5%	1.0% ²	1.12% ²
% of population living in Greater Capital Cities (Aust) ³ / Census Metropolitan Areas (Can) ² / Metro Vancouver area (BC) ²	82%	71%	53%

Based on and includes information from the following sources:

1 Source: Australian Bureau of Statistics, Australian Demographic Statistics. 3218.0 Regional population growth, Australia. (Mar 2016)

2 Source: Statistics Canada, Population and dwelling counts 2016. (released 8 Feb 2017)

3 Source: Australian Bureau of Statistics, Australian Demographic Statistics. 3218.0 Regional Population Growth, Australia 2012-13. (30 Mar 2017)

Indigenous populations

In Australia, 3% of the population identifies as Aboriginal and Torres Strait Islander, compared to 4.3% of the total population in Canada (First Nations, Metis or Inuit). In British Columbia, 5% of citizens reported through the most recent data that they belong to First Nations communities.

Of British Columbia's student population, 11.5% was Aboriginal (British Columbia Ministry of Education (BCME), 2016a), of whom 12.1% lived on reserves. Of the total number of aboriginal people in Canada, 16.6% lived in British Columbia. Only one in three Indigenous people lived in a major city in Australia at the 30 June 2011 census (ABS, 2013a), meaning that the majority of Indigenous students resided in a regional or remote location.

Academic performance, as measured by international assessment studies such as Programme for International Student Assessment (PISA) and Trends in International Mathematics and Science Study (TIMSS), indicates that, on average, Indigenous students are up to two years behind in education in Australia. Nearly 84% of Indigenous students were enrolled in government schools in 2016, while 10.5% reported enrolment in Catholic schools and 5.6% in Independent schools (ABS, 2017b).

Table 2. 2 Key Indigenous population measures

	Australia	Canada	British Columbia
Indigenous % of total population (2011)	3.0% ¹	4.3% ²	5.0% ²
% Indigenous students to general student population	5.5% ⁵ in 2016	7.0% ² aged 14 and under (5.9% of students aged 15-24)	11.5% ³ in 2016
% of Indigenous students who have completed Year 12	25.7% ⁴ (2015)	22.7% ⁶	n/a (see discussion below re Grade 8 Certificate of Graduation)

Based on and includes information from the following sources:

1 Source: Australian Bureau of Statistics, 3238.0 Estimates and projections, Aboriginal and Torres Strait Islander Australians, 2001-2026 (released 30 Apr 2014)

2 Source: Statistics Canada, 2011 Census data (99-011-X)

3 Source: British Columbia Ministry of Education, Aboriginal Report 2011/12–2015/16: How are we doing?

4 Source: Australian Bureau of Statistics, 4714.0 National Aboriginal and Torres Strait Islander Social Survey, 2014-15

5 Source: Australian Bureau of Statistics, 4221.0 Schools, Australia, 2016

6 Source: Statistics Canada, 2011 Census data (89-656-X), 2015

The Australian Bureau of Statistics notes that a quarter of Aboriginal and Torres Strait Islander Peoples has completed Year 12. Indigenous residents in non-remote areas were more likely than those in remote areas to have completed Year 12 or equivalent – 28% compared with 18% (ABS, 2016).

In British Columbia, the Ministry of Education monitors the “six-year completion rate”, which is the percentage of Grade 8 students who leave school with a Certificate of Graduation. In 2015–16, 86% of non-aboriginal students graduated with a Certificate of Graduation versus a completion rate of 64% of all students identifying as aboriginal.

The gap between females and males was more pronounced for aboriginal students (69% female/60% male) versus 88% female/84% male for non-aboriginal students (BCME, 2016a).

Economy

Canada’s Gross Domestic Product (GDP) result was roughly 40% higher than Australia’s in 2016, as illustrated in the table below. However, at the time of publication of this comparative study, the overall economic situation for Australia was more positive than that of Canada, with higher GDP growth over a long period and marked by the fact that Australia has not had a recession in over 25 years.

Table 2. 3 *Key economic measures*

	Australia	Canada	OECD Average
GDP (USD trillion) 2016	1.189 ¹	1.672 ¹ (BC 0.187)	n/a
% GDP growth 2016	2.4% ⁵	1.9% ²	1.7% ³
% GDP spent on education ⁴	5.6%	6.1% ² (BC 3.0%)	5.2%
- Primary education ⁴	1.8%	2.1%	1.5%
- Secondary education ⁴	2.0%	1.5%	2.2%
Average \$ spent per student 2013 (USD) ⁴			
- Primary education	8,289	9,130	8,477
- Secondary education	10,932	Unavailable ⁶	9,811

Based on and includes information from the following sources:

1 Source: *International Monetary Fund, GDP based on purchasing power parity (PPP)*

2 Source: Based on *Statistics Canada, GDP expenditure-based, by province and territory, 2017 (Table 384-0038)*

3 Source: *OECD Data, Real GDP forecast (accessed 6 April 2017)*

4 Source: *OECD Education at a Glance 2016: OECD Indicators. Table B2.1 Expenditure on educational institutions as a percentage of GDP, by level of education (2013)*

5 Source: *Reserve Bank of Australia, Australian Economy Snapshot (accessed 6 April 2017)*

6 Canada’s reporting does not measure overall secondary results – upper secondary only shows USD12,036 spent per student.

Despite lower GDP growth over an extended period and an average GDP per capita that is 5.6% lower than Australia’s (OECD, 2016c), Canada, according to the most recent OECD data, spent 6.1% of GDP on education versus 5.6% in Australia (for the year 2013), with higher relative investment in the primary and tertiary sectors (see Figure 2.1).

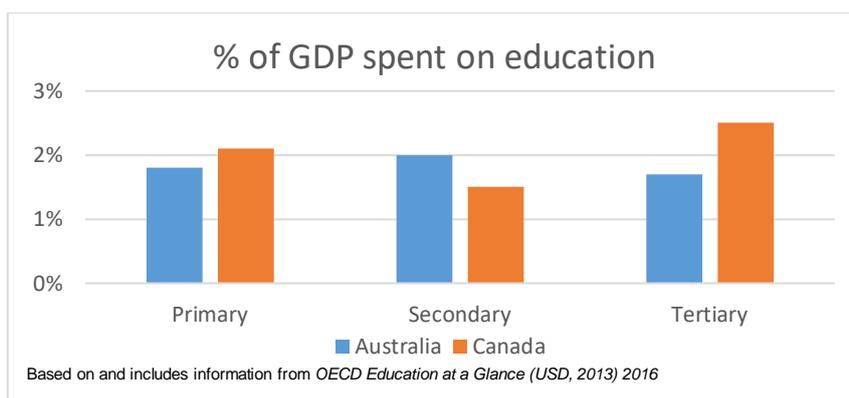


Figure 2. 1 Percentage of GDP spent on education (2013)

The rate of population growth in Australia over the last five years has been 50% higher than that of Canada. This is a major factor (along with wage inflation) in the 24% overall increase (\$34.9b to \$43.1b) in school education expenditure in Australia between 2005/6 and 2014/15 (O’Connell & Torii, 2016).

Teaching

The student-teacher ratio is higher in Australia than in Canada and it is higher than the OECD average, especially in secondary education (see Table 2.4). However, Australian students appear to have access to more instruction time during the compulsory years of education, with the highest hours among OECD countries for primary and lower secondary education. The total number of hours for an Australian student in primary and lower secondary is 11,000 hours versus 8,290 in Canada and the OECD average of 7,540.

Table 2. 4 Key teaching measures

	Australia	Canada	OECD average
Ratio of students to teaching staff ¹			
- Primary education	16	16	15
- Secondary education	16	14	13
Compulsory hours in primary and lower secondary ¹	11,000	8,290	7,540

Based on and includes information from the following source:

¹ Source: *OECD Education at a Glance 2016: OECD Indicators*

The salaries of beginning teachers in Australia appear to be on par with their Canadian counterparts, but experienced teachers did not record commensurate salary increases. Canada pays its longer-serving teachers significantly more than does Australia (see Figure 2.2). With 10 years of experience, Canadian primary and lower/upper secondary teachers were earning approximately 10% more than Australian teachers. This differential rose to around 15% after 15 years of teaching experience (see Figure 2.2).

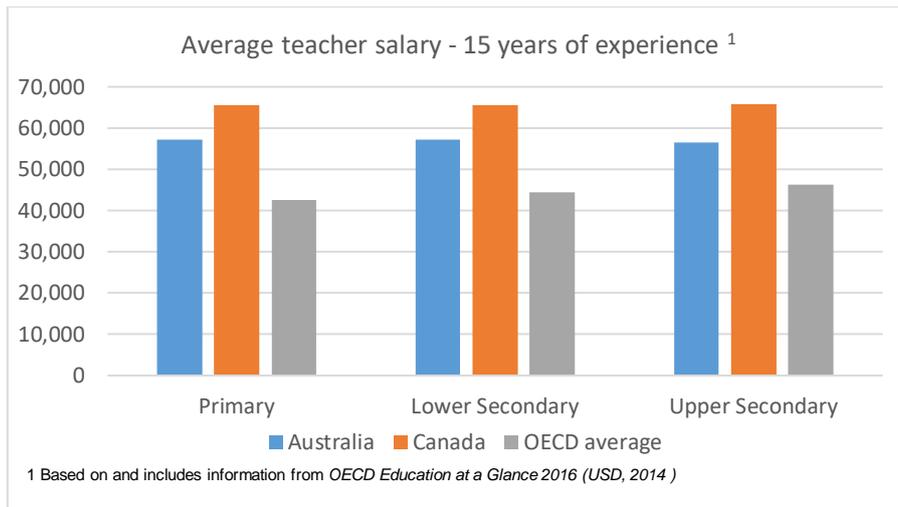


Figure 2. 2 Average teacher salaries after 15 years of employment

Diversity

Migration is a significant factor in population diversity, impacting educational planning both in Australia and Canada. The 2011¹ Australian Census reported that 24.6% of Australians were born overseas, with a further 20% having at least one parent born overseas. Approximately 53% of respondents reported that one or more of their grandparents was born overseas (ABS, 2013b). The percentage of foreign-born Australians is the third highest amongst the OECD countries (OECD, 2017b).

In 2011², 20.6% of Canadians were foreign-born, the sixth highest proportion among OECD countries. Of these foreign-born Canadians, 17.6% reported residing in British Columbia.

In Australia, the most common country of birth for the overseas-born population is the United Kingdom, followed by New Zealand, China and India (see Figure 2.3).

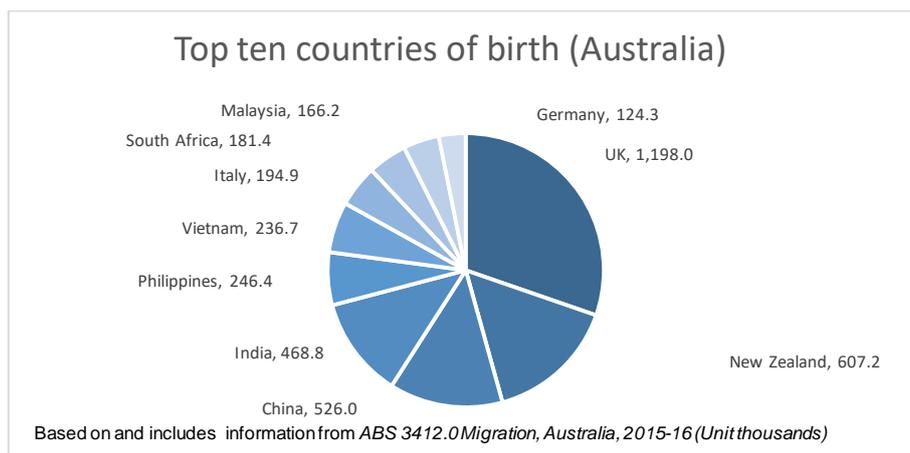


Figure 2. 3 Country of birth (Australia) ©

¹ The results of the 2016 Australian Census are not yet available.

² The *Immigration and Ethnocultural Diversity in Canada* report based on the 2016 census is not due for release until October 2017.

In Canada, the most common country of origin for the overseas-born population is China, with India and the United Kingdom in second and third place (see Figure 2.4).

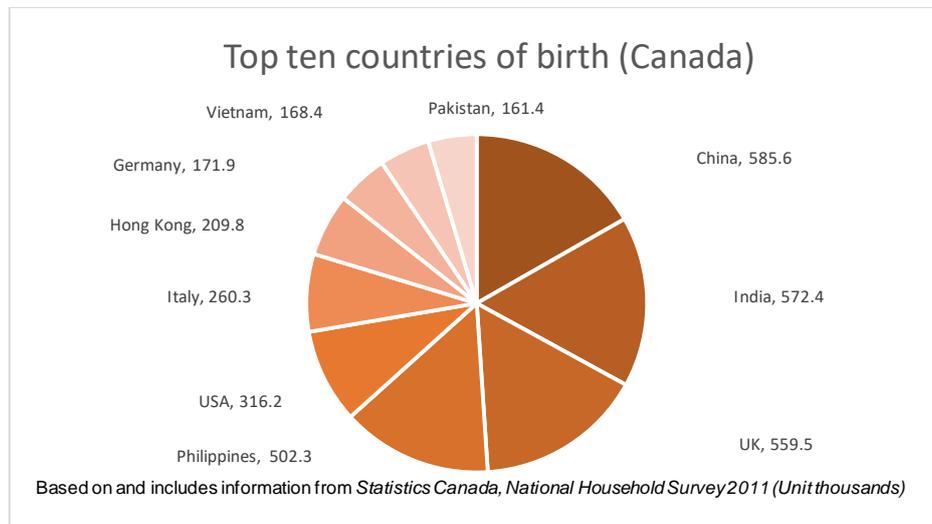


Figure 2. 4 Country of birth (Canada) *

The high level of migration in Australia and Canada, added to the high proportion of immigrants from non-English speaking backgrounds, suggests that significant ESL (English as a second language) support would be required for primary and secondary school students.

Linguistic diversity

Australia and Canada are both characterised by significant linguistic diversity. Canada has two official languages, and 21.3% of all citizens speak French as a first language. It is estimated that Canadians speak more than 200 other languages (Statistics Canada, 2011) the majority of those who do not speak English as a first language are speakers of Chinese languages, Tagalog (Philippines), Spanish and Punjabi.

Language diversity in Canada is more pronounced than in Australia, with 36.6% of the total Canadian population able to conduct a conversation in more than one language in 2011 (Statistics Canada, 2011). In Australia, however, less than 20% of the population can speak more than one language. In 2011, 80.7% of the population spoke English only, with the most common languages being Mandarin (1.7%), Italian (1.5%), Arabic (1.4%), Cantonese (1.3%) and Greek (1.3%) (ABS, 2012). Around 50 Indigenous languages are estimated to be still in use, a dramatic fall from the 250 believed to be spoken when Europeans first made contact with Aboriginal and Torres Strait Islander Peoples.

In British Columbia, English and French are core languages in the curriculum. Other language curricula include sixteen indigenous languages as well as Arabic, Croatian, Italian, Korean and Russian (BCME, 2017b).

© Based on and includes Australian Bureau of Statistics data

* Based on and includes Statistics Canada data

The AC has a framework for Aboriginal and Torres Strait Islander Languages as well as curricula for 16 languages; this includes two Classical languages and fourteen Asian and European languages.

Locality

In 2011, 82% of the foreign-born population lived in capital cities in Australia, whereas 91% of Canada's foreign-born population lived in a Census Metropolitan Area (Statistics Canada, 2011).

In a review of data from American, Canadian and Australian rural settings, Preston, Jakubiec and Kooymans (2013) noted that rural principals often have no English as a Second Language (ESL) training and struggle with fulfilling other leadership duties.

Australia is judged to have significantly higher population mobility than Canada, meaning that children may move between jurisdictions with resultant changes in educational programs. The annual cross-border mobility for Australia in 2014 was 1.4% versus 0.8% for Canada (OECD, 2016b).

Education levels among migrant populations

The high migration levels in Australia and Canada have an interesting effect on the educational achievement of the children of migrants. The OECD average shows that children whose parents are both immigrants are less likely to attain a tertiary education than an education at below upper secondary level. However, in both countries, the rate of tertiary attainment among students whose parents are both foreign-born is significantly greater than among other groups, indicating the importance of education for Australian and Canadian migrants.

Table 2. 5 *Educational achievement among students with native-born and foreign-born parents*

	Australia		Canada		OECD average	
	Both native parents	Both foreign parents	Both native parents	Both foreign parents	Both native parents	Both foreign parents
Students aged 25-44 with highest educational attainment ¹ :						
- Below upper secondary	56%	31%	61%	30%	73%	23%
- Upper secondary or non-tertiary post-secondary	53%	31%	65%	26%	79%	14%
- Tertiary	38%	50%	50%	42%	78%	16%
25-44 year olds with tertiary level attainment where parents are also tertiary-educated ¹	57%	81%	67%	83%	67%	66%

Based on and includes information from the following source:

¹ Source: *OECD Education at a Glance 2016: OECD Indicators (Tables A4.1 and A43, year: 2012) as a % of total at that level*

Educational achievement

The highest rate of educational attainment in Australia is among students completing the upper secondary qualification. This is also the case for the OECD average.

In addition, Australia has a significant proportion of bachelor-level graduates, whereas Canada has its greatest proportion of adults aged 25-64 completing a short-cycle tertiary qualification as their highest educational attainment (OECD, 2016b), as shown in Figure 2.5.

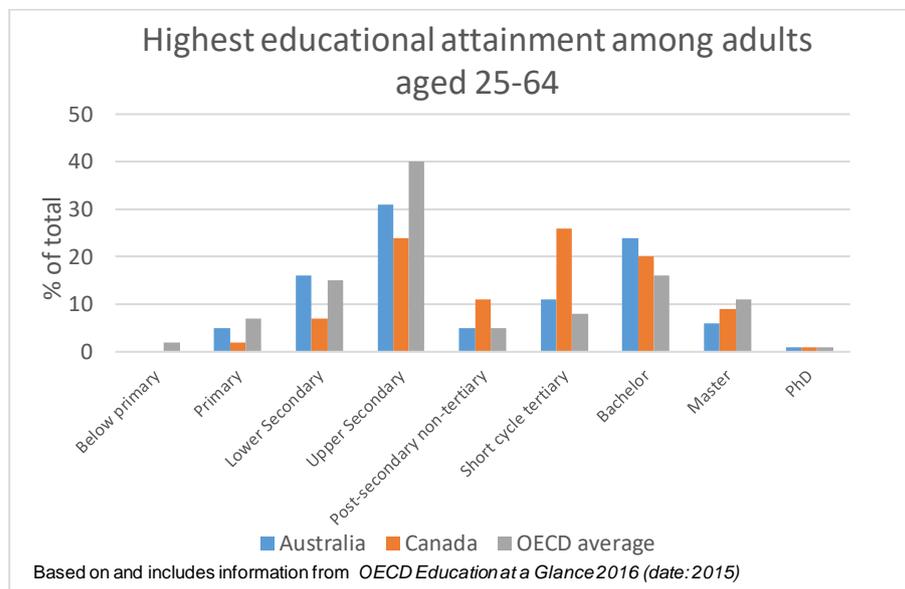


Figure 2.5 Highest educational attainment among adults (2015)

Approximately 43% of Australia’s adults aged 25-64 have a tertiary qualification versus 55% in Canada – the highest of the OECD countries and well in excess of the average of 35% in the OECD.

In both Australia and Canada, the fields of education studied among tertiary-educated adults are broadly similar to those studied by adults aged between 25 and 64, as demonstrated in Figure 2.6, except for:

- Social Sciences/Business/Law, where Australia dominates (35% versus 25% in Canada)
- STEM fields, where Canada dominates (31% versus 22% in Australia)
- Health and Welfare (Australia 16% versus 12% in Canada).

The gender split by field of tertiary education is remarkably similar in Australia and Canada, except for Health and Welfare, where there are significantly more females in Canada (at 5.4 female graduates for every male versus 3.5 female graduates for every male in Australia).

In the sciences, Canada has 1.25 male graduates for every female graduate, whereas Australia has 1.67 males for every female (OECD, 2016b).

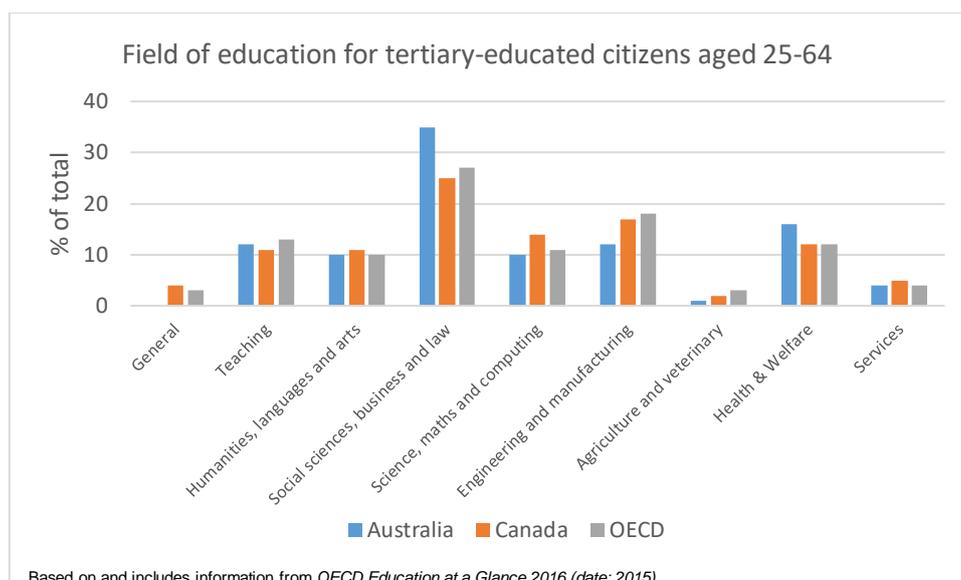


Figure 2. 6 Field of education for tertiary-educated adults

The lower appetite for tertiary education in Canada is also reflected in its lower proportion of adults with vocational qualifications. In Australia, the number of adults aged 25-64 who have attained a vocational qualification is 22% of their cohort, compared to just 11% in Canada.

Post-education employment

OECD data show that employment rates for adults aged 25-64 with an undergraduate or postgraduate degree are almost identical, with Australia at 84% and Canada at 83%. However, employment rates for Australians with upper or lower secondary education are better. The superior employment outcomes in Australia could be related to better overall employment prospects in Australia, with the unemployment rate at 5.9% for Australia versus 6.7% for Canada (iEconomics, 2017).

Table 2. 6 *Employment by highest educational attainment*

	Australia	Canada	OECD average
Lower secondary	64%	59%	60%
Upper secondary	77%	71%	74%
Undergraduate	84%	83%	82%
Postgraduate	84%	83%	87%

Based on and includes information from the following source:

1 Source: *OECD Education at a Glance 2016: OECD Indicators* (Table A5.1, year: 2015) as a % of total at that level

The OECD reports that 32% of adults aged between 25 and 64 held tertiary qualifications in 2005, rising to 43% in 2015 (OECD, 2016b). This is likely to be linked to the youth unemployment rate, which is significantly higher than the unemployment average among older Australians. Youth unemployment in the first quarter of 2017 was 13.30% in Australia versus 12.80% in Canada (iEconomics, 2017).

Progression to tertiary studies appears not to be as financially beneficial in Australia as in Canada. Australians with an undergraduate degree will earn on average 39% more than an Australian with an upper secondary education, whereas in Canada this differential is 47%. The favourable margin is even higher for Canadians educated to master's or doctoral level; they earn 77% more than their secondary-educated counterparts (55% in Australia) (OECD, 2016b).

Comparative International Performance

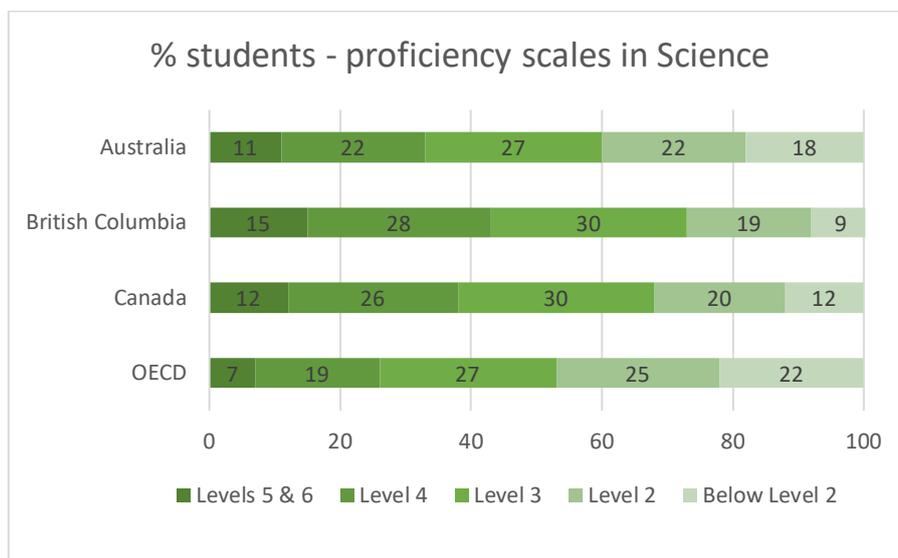
The Programme for International Student Assessment (PISA) is designed to provide policy-oriented international indicators of the skills and knowledge of 15-year-old students across the member countries of the OECD.

PISA 2015 is the sixth cycle of PISA since it was first conducted in 2000 and both Australia and Canada have participated since its introduction. PISA 2015 focused on scientific literacy, with mathematical and reading literacy as minor domains in this round. For the first time, PISA 2015 also included financial literacy and a collaborative problem-solving assessment for countries who selected to participate in the computer-based delivery.

Performance – Science Literacy

Canada ranked seventh in Science Literacy among OECD countries and British Columbia was the most successful of all Canadian provinces, with a ranking that would have put it in second place overall in this assessment (OECD, 2016c).

In terms of proficiency levels, 15% of British Columbia students scored at the top levels of Level 5 and 6, almost double the OECD average and well above both the Canadian and Australian averages. Level 2 is considered the baseline level of scientific literacy proficiency.



Based on and includes information from the following sources:

Source: Council of Ministers of Education, Canada: *Measuring up: Canadian Results*

Source: Australian Council for Educational Research: *PISA 2015: Reporting Australia's results*

Figure 2. 7 Proficiency Scales – Science

Australia's results showed a large differential between the performance of the top 10% and bottom 10% of students, as demonstrated in Table 2.8, suggesting lower equity than in other OECD countries.

Table 2. 7 Performance in Science Literacy (PISA 2015)

	Australia	Canada	British Columbia	OECD average
Average score	510	528	539	493
Score difference between 10 th and 90 th percentiles ¹	267	246	237	247
% of immigrant students in PISA 2015 ²	25%	30.1%	Not available	12.5%
% of variation explained by students' socio-economic status	11.7%	8.8%	Not available	12.9%

Based on and includes information from the following sources:

1 Source: CMEC, *Measuring Up: Canadian Results of the OECD PISA Study*

2 Source: OECD, *PISA 2015 Results (Volume 1): Excellence and Equity in Education, Table I.7.9 Immigrant students' performance in science, by country of origin and destination*

There was no statistical difference between the performance of boys and girls in Science either in Australia or Canada, and any difference was minor in relation to the OECD average - 495 for boys versus 491 for girls (OECD, 2017d).

Considering performance over time, Australia lost 17 average points between 2006 and 2015, whereas Canada lost 7 points and British Columbia was unchanged (CMEC, 2016).

Performance – Reading Literacy

Canada ranked equal second in Reading Literacy in the OECD and British Columbia ranked higher than the highest-ranking country in the OECD, Singapore. Australia ranked 16th in Reading. Australia's results also showed a large differential between the performance of the top 10% and bottom 10% of students, suggesting lower equity than in other OECD countries.

Table 2. 8 Performance in Reading Literacy (PISA 2015)

	Australia	Canada	British Columbia	OECD average
Average	503	527	536	493
Point difference between 10 th and 90 th percentiles ¹	266	238	229	249

Performance – Mathematics Literacy

Canada ranked tenth in Mathematics Literacy in the OECD and British Columbia's performance would have seen it ranked eighth in the OECD. Australia ranked 26th in Mathematics Literacy. Interestingly, the performance of the French-language schools in Canada was significantly better for Mathematics than the English-language schools (542 versus 509, resulting in an average of 516). Australia's results showed a higher differential

between the performance of the top 10% and bottom 10% of students as demonstrated in Table 2.9, suggesting lower equity than in other OECD countries.

Table 2. 9 Performance in Mathematics Literacy (PISA 2015)

	Australia	Canada	British Columbia	OECD average
Average	494	516	522	490
Point difference between 10 th and 90 th percentiles ¹	242	227	219	232

Comparative performance in PISA - Australia

In Science Literacy, the average indigenous student scored 76 points lower than the average non-indigenous student, equivalent to two-and-a-half years of schooling. Further, the average indigenous student scored 71 points lower in Reading Literacy and 70 points lower in Mathematics Literacy, equating to around two-and-a-third years of schooling for both literacies.

Metropolitan students had a distinct advantage over provincial (or rural) students, which was even more pronounced when compared with the performance of their peers in remote areas.

The difference in average performance based on migration status was not as marked. Although Australian-born students appeared to have some advantage over their foreign-born and first-generation counterparts in Science and Reading literacies, they were less successful in Mathematics Literacy.

Finally, difference in performance by gender was only significant in Reading, where females had a one-year of schooling advantage over their male peers.

Table 2. 10 Score difference in performance in Australia (PISA 2015)

	Science Literacy ¹	Reading Literacy ¹	Mathematics Literacy ¹
Indigenous students: versus non-Indigenous students	-76 (~2.5 years of schooling)	-71 (~2.3 years of schooling)	-70 (~2.3 years of schooling)
Metropolitan: versus Provincial versus Remote	+26 (~1 year of schooling) +44 (~1.5 years of schooling)	+31 (~1 year of schooling) +46 (~1.5 years of schooling)	+29 (~1 year of schooling) +42 (~1.5 years of schooling)
Australian: versus Foreign-born versus First-generation	+15 (~0.5 years of schooling) +10 (~0.3 years of schooling)	+17 (~0.5 years of schooling) +16 (~0.5 years of schooling)	-6 (statistically similar) -14 (~0.5 years of schooling)
English spoken at home: versus LOTE *	+27 (~1 year of schooling)	+20 (~0.6 years of schooling)	+9 (statistically similar)
Females: versus males	-2 (statistically similar)	+32 (~1 year of schooling)	-6 (statistically similar)

Based on and includes information from the following source:

¹ Source: Thomson, S., De Bortoli, L., & Underwood, C. (Australian Council for Educational Research). PISA 2015: Reporting Australia's results

* LOTE: A Language other than English. This category refers to 'language spoken at home most of the time'.

International assessments (PISA, TIMSS and PIRLS): Equity and performance levels

The PISA 2015 results showed that, in Science Literacy, students from higher socio-economic backgrounds in Australia scored on average significantly higher than students from low socio-economic backgrounds. The difference represents approximately three years of schooling (more than one proficiency level); this difference was also recorded for Reading Literacy and Mathematics Literacy.

The OECD noted that Canada achieves excellent results in Science, even though the relationship between student performance and socio-economic status is significantly weaker than the OECD average. Australia achieves well in Science with a level of equity comparable to the OECD average (OECD, 2016c). Thus, Canada is deemed to be a high-performing, high-equity system.

Another international study of student achievement is the Trends in International Mathematics and Science Study (TIMSS), which focuses only on Year 4 and Year 8 results in Mathematics and Science. TIMSS 2015 is the sixth study to be conducted across forty-nine education systems, including Australia and Canada. The TIMSS 2015 study shows a greater distribution of results for Australia compared with Canada, confirming greater inequity both across Years 4 and 8, and both in Mathematics and Science (International Association for the Evaluation of Educational Achievement (IEA), 2015 a,b).

Based on the results in Mathematics and Science, the difference in performance between Australia and Canada is not pronounced at Year 4. By Year 8, however, Canadian students are ranked eighth to Australia's seventeenth place in Mathematics, and thirteenth compared to Australia's seventeenth position in Science.

The Progress in International Reading Literacy Study (PIRLS) is another international study of student achievement, but one that is focused on Reading. With the 2016 results yet to be released, examination of the 2011 results shows a greater distribution of results in Australia compared with Canada, confirming a lower level of equity related to Reading in Australia. Canada ranked 12th and Australia ranked 27th in the 2011 study (IEA, 2012).

2.3. Curriculum design principles and purpose

This section provides further contextual detail regarding the recent curriculum design work undertaken in Australia and British Columbia. As seen in the preceding demographic analysis, the contexts and challenges influencing curriculum decisions in Australia and British Columbia are similar, including, but not limited to, students' cultural diversity, interests and abilities. In general, the curriculum design principles adopted in both locations reflect the aim of meeting the needs of a wide range of students using flexible curriculum instruments. Both curricula state their intention to produce informed citizens who have the knowledge and skills to navigate an increasingly complex world. Both documents also identify equity as central to the design and delivery of a truly effective curriculum.

2.3.1. British Columbia's New Curriculum: Design principles

The government of British Columbia expects significant economic and employment growth over the next decade and the ministry has been explicit about enabling young people to meet the needs and demands of this opportunity (BCME, 2015c, p. 3).

British Columbia's Education Plan, for which Australia has no national equivalent, was first published in 2011 as the redesigned curriculum was taking shape. Revised in 2015, the document highlights a single outcome for students learning via a new curriculum:

Capable young people thriving in a rapidly changing world.

To achieve this, we need an education system that better engages students in their own learning and that fosters the skills and competencies they will need to succeed. The focus for this transformation is the movement to increasingly personalised learning, which is enabled and supported by quality teaching and learning, flexibility and choice, and high standards. (BCME, 2015c, p.4)

The renewed BCC, first proposed in 2010 after broad consultation, is designed to "... transform education in BC to better meet the needs of all learners" (BCME, 2012, p. 2). During the early planning stages, a single statement encapsulated the thinking behind the proposal, namely: "... the Province needs a more flexible curriculum that prescribes less and enables more, for both teachers and students [and] ... that will best prepare students for their futures and based on a curriculum that prescribes fewer but more important outcomes" (BCME, 2012, p. 2). The emphasis on the capacity of the curriculum to personalise the learning of British Columbia students was a key design principle reflecting a less prescriptive approach.

Already satisfied with British Columbia's international rankings in PISA and other provincial and international measures of performance, the province's education authorities have arguably been freer to redesign the curriculum in ways that reflect, and perhaps transcend, emerging educational trends. The BCC seeks to prepare students for future challenges, where metacognition and problem-solving, collaboration and creative thinking may need to take precedence over prescribed content.

The website explains that BC's new curriculum brings together two features that most educators agree are essential for 21st century learning: a concept-based approach to learning, and a focus on the development of competencies, to foster deeper, more transferable learning. Three elements, the Content (Know), Curricular Competencies (Do), and Big Ideas (Understand) all work together to support deeper learning (BCME, 2017a). These fundamental design principles are represented in figure 2.3.1.

Additionally, a set of guiding principles underpins the two main design features, as follows:

- make curriculum more flexible to better enable teachers to innovate and personalise learning
- reduce the prescriptive nature of current curricula while ensuring a solid focus on essential learning
- focus new curricula on higher order learning, giving emphasis to the key concepts and enduring understandings (big ideas) that students need to succeed in their education and their lives
- make explicit the cross-curricular competencies that support life-long learning
- respect the inherent logic and unique nature of the disciplines while supporting efforts to develop cross-curricular units
- integrate aboriginal worldviews and knowledge
- develop assessment and evaluation programs that align with the changed emphases in curriculum. (BCME, 2013, p. 3)

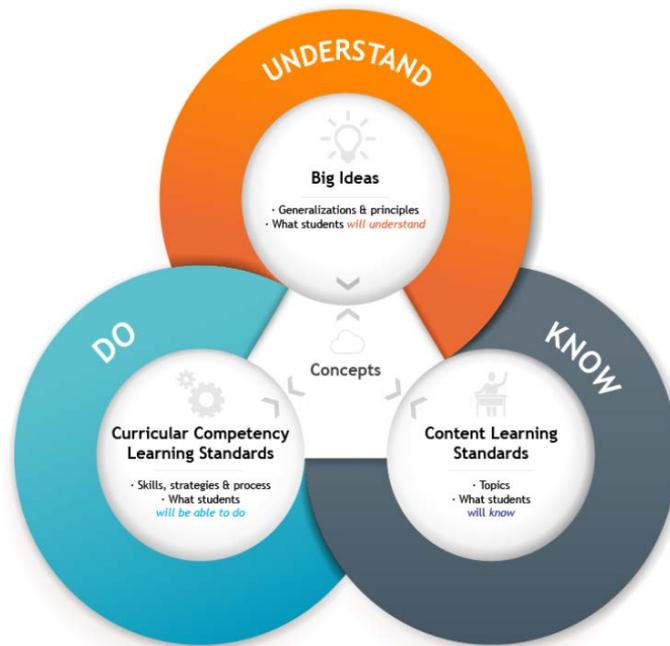


Figure 2. 8 Curriculum model (Know-Do-Understand)

From “BC’s New Curriculum” by Government of British Columbia, 2018

(<https://curriculum.gov.bc.ca/curriculum-info>).

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The design establishes a student-centred curriculum, intended to provide maximum flexibility to meet the needs of individuals and to promote inclusive and collaborative learning that harnesses students’ passions and interests, and delivers tailored feedback and coaching (BCME, 2015c, p.3). It is important to note that “personalised learning environment” is a recurring phrase that differentiates the new curriculum from its predecessor.

The central place of the student in the design of the British Columbia New Curriculum is most visible in the regular use of the first person; this is particularly prominent in the language of the Big Ideas. It is also a pillar of the British Columbia Education Plan, which states that students must be at the centre of their learning. For example, Kindergarten students learning about Social Studies encounter three Big Ideas, one of which tells them that *Stories and traditions about ourselves and our families reflect who we are and where we are from* (BCME, 2017c). This feature of the BCC is discussed elsewhere in this paper, particularly in the comparison of learning areas.

This principle is mirrored in the OECD Education 2030 Project (OECD, 2017a), where student agency is identified as one of three underlying key concepts of the draft Conceptual Learning Framework. Student agency is regarded as essential to young learners’ development of the transformative competencies required to navigate the VUCA world of the 21st century.

The BCC’s emphasis on personalised learning means that individual passions and interests can be pursued, with the intention of imbuing a sense of personal responsibility for learning.

This sense of responsibility is not only encouraged in students through the use of the first person in the Big Ideas, but also reinforced by the use of the second person in the sample activities that support the learning standards in the curricular competencies.

For example, Kindergarten students who are learning to recognise different perspectives on people, places and events in their lives are assisted by a sample activity that speaks directly to them: *If two people have different perspectives or opinions, does it mean that one person is right and the other is wrong? Explain your answer* (BCME, 2017c).

Pedagogical direction in the BCC is minimal. Increased flexibility has been provided in the renewed curriculum so that teachers and students can create responsive learning environments that are fit for context, need and purpose. Improved sensitivity around student diversity and access to technology are embedded, and there are explicit references to ensuring that basic literacy and numeracy are strengthened throughout the learning areas.

Flexible learning environments in the renewed curriculum are supported in three ways:

- fewer learning standards to enable teachers to consider creative and flexible ways to unlock the learning potential of students in their charge
- flexible structure so that learning standards can be met by travelling widely outside of the traditional boundaries of teaching and learning, driven by the passions and interests of students themselves
- inquiry-based learning that promotes a problem-solving approach to the student's experience.

The Core Competencies of communication, thinking, and personal and social responsibility sit atop the curricular learning areas. These are designed to equip all students with the skills needed to successfully navigate the demands of 21st century life and work (BCME, n.d.).

BC's new curriculum claims the capacity to effect intellectually engaging pedagogy, as opposed to maintaining the traditional coverage-centred model of curriculum and instruction. It draws on Erickson and Lanning (2014) who bring together the Structure of Knowledge (Erickson, 1995) and Structure of Process (Lanning, 2013) to present complementary models for both content-driven and process-driven subjects (Erickson & Lanning, 2014, p. 2).

Consistent with a concept-based curriculum design, a three-dimensional concept-based model focuses on deep understanding supported by related facts and skills, as opposed to the traditional two-dimensional curriculum model that focuses on factual knowledge and skills (Erickson & Lanning, 2014, p. 2). The Structures for Knowledge and Process replicate the three-dimensional model for teaching and learning. Erickson's Structure of Knowledge as a three-dimensional model engages students in higher-order thinking that permits them to see patterns between new knowledge and prior knowledge and takes them beyond the facts of transferable understandings (Erickson & Lanning, 2014, p. 3). Lanning's Structure of Process complements Erickson's Structure of Knowledge and plays a key role in informing the development of process-driven disciplines such as English and the Arts to apply to their conceptual understandings, strategies and skills to content offered by the Structure of Knowledge, but the disciplinary work is bedded in the Structure of Process (Erickson & Lanning, 2014, p. 44).

As is true of the AC, BC's new curriculum is in the implementation phase. BC's Kindergarten-to-Grade 9 curriculum was introduced in the 2015–16 school year. It is expected that the entire K–12 curriculum will be phased in by the 2017–18 school year.

The curriculum design provides the flexibility to serve the unique needs of classrooms, students and teachers. BC school authorities anticipate that the curriculum redesign will encourage teachers to create courses, modules, thematic units or learning experiences that extend beyond the confines of the learning area to focus on students' needs and interests or local contexts. The focus on personalisation and a flexible structure, for example, sits well with the configuration of combined grade classrooms and multi-grade programs. The design also supports teachers to combine the learning standards in differing ways and across disciplines.

2.3.2. The Australian Curriculum: Design principles

It is not the purpose of this paper to provide a detailed critique of the history and development of the AC. Relevant aspects of the process and the AC's characteristics are provided here for the purpose of the comparative study.

The AC has its origins in a single document, the *Melbourne Declaration on Educational Goals for Young Australians* (Ministerial Council on Education, Employment, Training and Youth Affairs, 2008), which identifies two overarching goals:

Goal 1: Australian schooling promotes equity and excellence

Goal 2: All young Australians become:

- successful learners
- confident and creative individuals
- active and informed citizens.

In contrast to British Columbia, which is a province of Canada and has legislative freedom to develop and implement a new curriculum, Australia is a federal system wherein both the development and implementation of a national curriculum depend on a high degree of cooperation from the states and territories, largely because these jurisdictions have legislative responsibility for education. ACARA is responsible for Australia's first national curriculum. ACARA's stated mission is to improve the learning of all young Australians through world-class school curriculum, assessment and reporting.

Eleven propositions have shaped ACARA's development of the AC, with the overarching rationale centred on two features:

- Quality – an Australian Curriculum will contribute to the provision of a world-class education in Australia by setting out the knowledge, understanding and skills needed for life and work in the 21st century and by setting high standards of achievement across the country
- Equity – an Australian Curriculum will provide a clear, shared understanding of what young people should be taught and the quality of learning expected of them, regardless of their circumstances, the type of school that they attend or the location of their school. (ACARA, 2012a)

The Shape of the Australian Curriculum (v 4.0, 2012a) underwrites the purpose of the Australian Curriculum:

- to improve the quality, equity and transparency of Australia's education system. [Quality is defined as knowledge, understanding and skills needed for life and work in the 21st century. Equity is defined as a clear, shared understanding of what young people should be taught and the quality of learning expected.]
- to address the intellectual, personal, social and educational needs of young Australians within the context of a changing global environment so that they can function as successful learners, confident and creative individuals and active and informed citizens.

The AC is presented as a progression of learning from Foundation to Year 10, with subjects available for study in the senior secondary years (Years 11 and 12). Among the eleven propositions that inform the design of the Australian Curriculum, item (i) explicitly states that:

The primary audience for the Australian Curriculum is teachers. The curriculum is concise and expressed in plain language while preserving a complexity appropriate for professional practitioners. Consistency in terms of language and broad structure supports teachers in planning within and across learning areas. (ACARA, 2017b)

Numerous other propositions also point to the teacher as the primary consumer and interpreter of the AC. Teachers and schools are expected to make decisions about the delivery of the AC, including the allocation of time and other resources as appropriate to their local context, and they are responsible for all pedagogical and other considerations that will meet the needs of their students.

Students are identified in the achievement standards, specifically in relation to the expectations set for them by the AC at the various stages of schooling. The AC recognises the entitlement of each student to knowledge, understanding and skills that provide a foundation for successful and lifelong learning and participation in the Australian community.

Like the BCC, the AC is distinctive in its multi-dimensional design. As can be seen in the diagram below, the three dimensions of disciplinary knowledge, skills and understanding, General Capabilities and Cross-Curriculum Priorities appear to be accorded equal weight. The eight learning areas comprise an extensive collection of content descriptions, elaborations and achievement standards. The General Capabilities and Cross-Curriculum Priorities are designed to be taught through each of the learning areas, as teachers consider appropriate.

The three dimensions of the Australian Curriculum



Figure 2. 9 The Australian Curriculum 'cube'

The three dimensions of the Australian Curriculum, ACARA (2017d), from <https://www.australiancurriculum.edu.au/f-10-curriculum/structure/>

3. COMPARATIVE STUDY

3.1. Purpose

As part of the commitment to monitoring international developments in curriculum design, a key component of ACARA's program of research involves comparison of the Australian Curriculum with high-performing school systems and countries.

3.2. Method

This comparative study is based on the *Australian Curriculum Version 8.3* (ACARA, 2016a), the *British Columbia Curriculum Grades K-9* for implementation 2016/17 (BCME, 2015a), and the *British Columbia Curriculum Grade 10* (draft) for implementation 2018/19 (BCME, 2015b).

ACARA's Curriculum Specialists conducted a detailed comparison of their learning areas during the first half of 2017. Given the AC's provision of eight learning areas for Foundation to Year 10, the comparison points for all learning areas were **Years 2, 6 and 10**. In some learning areas, it was not possible to make a completely straightforward comparison with Year 10 as BC's new curriculum offers wide choice for students in Grade 10 and this year level also marks the start of the senior secondary provision.

In addition to comparisons of the discrete learning areas, a comparative analysis was undertaken of the AC: General Capabilities and the BCC: CC. A further comparison was made between the Aboriginal Knowledge and Perspectives dimension of BC's New Curriculum and the Aboriginal and Torres Strait Islander Histories and Cultures Cross-Curriculum Priority in the AC.

The ten detailed analyses of these curriculum components are provided in their original templates in the body of this paper.

3.3. Data collection and analysis

ACARA's Curriculum Specialists conducted a comparative analysis of the BCC and the AC across Years 2, 6 and 10, using measurements of breadth, depth and rigour to make a determination on a three-point scale.

For the purpose of this analysis, the following understandings of breadth, depth and rigour were applied:

- **Breadth** refers to the range or amount of content or topics (predominantly factual and procedural knowledge) covered in the curriculum. This is often referred to as 'coverage'.
- **Depth** refers to the detail or amount of knowledge that leads to the development of deep understandings of key concepts, principles and knowledge and the ability to apply these understandings to real-life contexts.
- **Rigour** is defined as the cognitive demand required for students to engage in higher-order learning.

The data were collected by each Curriculum Specialist and recorded with the assistance of a template, then collated and graphically represented in the form of a heat map where the individual values contained in a matrix are represented as colours (Appendix A). Some variation in presentation is seen in the ten templates as differences in the provision and sequence of learning areas are addressed.

The findings were categorised and analysed by learning area and year (AC) and grade (BCC).

3.4. Findings

Evaluation of the AC reveals a high degree of consistency across the learning/subject areas and year levels in terms of breadth. Some variability was found in the BCC. Both curricula display greater variability in relation to depth and rigour.

The following section details findings by subject and year/grade with respect to breadth, depth and rigour.

Breadth

On balance, the analysis by the Curriculum Specialists shows that both curricula are providing students with considerable breadth and a degree of depth. Across the AC, there is a high degree of consistency in **breadth** for all subjects at Years 2, 6 and 10. This determination is based on evidence demonstrating that each learning area consists of quite dense and lengthy content descriptions supported by detailed elaborations, and a range of subject-specific topics deemed age-appropriate.

Some anomalies exist in the BCC with respect to The Arts, Technologies and Italian (Languages) at Grade 2; Mathematics, The Arts and Technologies at Grade 6; and the Social Sciences at Grade 10, all of which are deemed to have a *fundamental* degree of breadth.

Generally, these determinations are based on the lower number of content descriptions and elaborations and the coverage of subject-specific topics dedicated to the particular age group. As an example:

For students in Grade 10, the expectations of the draft British Columbia Curriculum: Social Studies (BCC: SS) are **fundamental** in relation to breadth of coverage. The content and competencies of the draft BCC: SS in Grade 10 allow learners to build upon the historical sequence of experiences from the new curriculum in Grades 7, 8 and 9. The draft British Columbia Curriculum: Social Studies is shaped by big ideas and concepts with a particular focus on Canada's place in the world over the past one hundred years, supported by optional highly-detailed elaborations.

This is to be compared with the expectations of the AC: Humanities and Social Sciences (AC: HASS) through the combined agency of four subject areas, which are all regarded as *comprehensive*.

The concepts and skills of Australian Curriculum: History (AC: H), Australian Curriculum: Geography (AC: G), Australian Curriculum: Civics and Citizenship (AC: CC), and Australian Curriculum: Economics and Business (AC: EB) in Year 10 allow learners to build upon experiences from each of these specific subject areas in

Years 7, 8 and 9. Each subject has its own collection of overarching concepts, inquiry questions, inquiry skills, knowledge and understanding, with associated elaborations to support teaching and learning.

Depth

The comparative study reveals variability surrounding **depth**. At a glance, per Table 3.1, a high degree of depth is accorded to most subjects across the AC, particularly in the secondary years.

Across the Australian and the British Columbia curricula, there is a high degree of consistency among top-tier subjects described as *challenging*, including English/English Language Arts at Year/Grade 2, 6 and 10, and Mathematics at Year/Grade 2 and 6 (see Table 3.1). The evidence provided in this comparative study determined that BC's Grade 10 Mathematics curriculum could not be assessed.³

Variation is also observed in the AC: Science, with a determination of *fundamental* depth at Year 2 and *limited* depth at Year 6. The rationale for this determination is cited from the analysis:

The expectations of the AC: S (Year 6) are **limited** with respect to the depth of coverage of knowledge and skills encountered in the curriculum. The flexibility relating to how scientific concepts are to be taught and the depth to which they are expected to be explored has already been addressed in the section on Year 2 / Grade 2, reinforcing that for Year 6, as demonstrated in section 3.2, the classification is justified.

The BC Science curriculum is deemed to have a high degree of depth across all years, as explained in the following extract from the learning area study.

The expectations of the BCC: S for Grade 6 are **challenging** with respect to the depth of coverage of knowledge and skills encountered in the curriculum. The BCC: S includes extensive supporting information in the form of sample questions and explanatory and exemplifying elaborations. To use an example related to the discussion of AC – Depth in the previous section, the BCC: S topic for Chemistry expects students to not only understand the difference between homogeneous and heterogeneous mixtures, but also to link this concept to the physical characteristics of their components that are the basis for the techniques that allow the separation of such mixtures.

³ The draft BCC: Mathematics Grade 10-12 was in preliminary form at the time this comparative study was undertaken. Findings for breadth, depth and rigour have not been included for BCC: Mathematics Grade 10s.

Table 3.1 *Subjects by Depth: Challenging* ⁴

Year/Grade	Australian Curriculum	British Columbia's New Curriculum
2	English Mathematics The Arts Languages, Italian	English Language Arts Mathematics Science
6	English Mathematics Humanities and Social Sciences The Arts Technologies Health and Physical Education	English Language Arts Mathematics Science
10	English Mathematics The Arts Technologies Health and Physical Education Languages, Italian	English Language Arts Science Arts Education Applied Design, Skills & Technologies

Table 3.2 shows subjects deemed to be *fundamental* in their expectations of Year 2 for the AC, including Science, Humanities and Social Sciences, Technologies and Health and Physical Education. This pattern is duplicated for the Social Sciences, Technologies and Physical Education across Grades 2, 6 and 10 for the BCC.

Table 3.2 *Subjects by Depth: Fundamental* ⁴

Year/Grade	Australian Curriculum	British Columbia's New Curriculum
2	Science Humanities and Social Sciences Technologies Health and Physical Education	Social Studies Applied Design, Skills & Technologies Physical and Health Education Second languages, Italian
6		Arts Education English Language Arts Social Studies Physical and Health Education Applied Design, Skills & Technologies
10	Science Humanities and Social Sciences	Social Studies Second languages, Italian Physical and Health Education

BC's curriculum structures are flexible, offering students options that allow the pursuit of interests and placement according to ability. This is evident in the Grade 10 ELA and Mathematics curricula, which are purposely designed to prepare students with skills for life beyond school. In this comparative study, the Grade 10 Mathematics curriculum cannot be assessed in breadth, depth and rigour, due to a lack of information in its draft form⁴. The Grade 10 ELA curriculum is judged to be *comprehensive* because of the breadth of options

⁴ The draft BCC: Mathematics Grade 10-12 was in preliminary form at the time this comparative study was undertaken. Findings for breadth, depth and rigour have not been included for BCC: Mathematics Grade 10.

available to students and a level of depth that presumes a deep understanding of key concepts, principles and knowledge and the ability to apply these understandings to real-world contexts.

Another example comes from the evaluation of BC's Arts curriculum for Grade 2, where the expectations are accorded the level of *fundamental*. The rationale for the determination is provided below.

Arts Education asks that students be exposed to elements of dance, drama, music and visual arts using the same suite of curricular competencies and content. There is minimal specific subject differentiation. For example, 'artist' is a generic term that might refer to a dancer, musician or actor. While one of the Big Ideas notes: "Dance, drama, music, and visual arts are each unique languages for creating and communicating", teachers are not provided with any detailed, unique competencies or content drivers to support this overarching outcome. It is assumed then, that teachers are expected to invest professional time in order to understand the unique 'language' of each subject. There is no doubt that some educators will maximise the inherent flexible opportunities that exist in the BCC: AE curriculum to provide deeper learning. However, it is not immediately evident.

Rigour

As this comparative analysis reveals, debate about curricular provisions frequently relates to rigour. There is a tendency to conceive of a flexible curriculum as having no intellectual *grunt*, or inevitably being less rigorous. This study contends that a flexible or concept-based curriculum derives its strength from the pedagogy and teacher expertise. As a rule of thumb, it may be difficult to ascribe a high degree of rigour if there is less discipline-specific content to consider; hence, the lesser ratings have applied to the BCC. For example, it was not possible to make a determination about rigour for BCC's Grade 10 English Language Arts and Mathematics curricula, owing to the flexible choices of study made available to students in the ELA curricula, and the provision of two streams of mathematical study. However, a determination of *comprehensive* and *challenging* was ascribed to breadth and depth for each of the Grade 10 ELA subject components, indicating a quality learning experience for students.

Table 3.3 shows that at Years/Grades 2 and 6 for English/ELA and Mathematics, the AC and the BCC are judged as having a high degree of rigour. This is also ascribed to Technologies at Years/Grades 6 and 10. At Year /Grade 10, there is consistency across both Arts curricula. The significant outlier is the AC's Science curriculum, which is judged as *fundamental* across all years compared with BCC Science, which is deemed *challenging* at Grades 2 and 10.

Table 3.3 *Subjects by Rigour: Challenging*⁵

Year/Grade	Australian Curriculum	British Columbia's New Curriculum
2	English Mathematics The Arts Languages, Italian	English Language Arts Mathematics Science
6	English Mathematics Technologies	English Language Arts Mathematics Applied Design, Skills & Technologies
10	The Arts English Mathematics Humanities and Social Sciences Technologies Health and Physical Education Italian	Arts Education Science Applied Design, Skills & Technologies

Table 3.4 shows that, across Years/Grades 2, 6 and 10 both for the AC and BCC, lesser determinations are ascribed to Social Sciences, Technologies, and Health and Physical Education. This finding is consistent with the determinations accorded to depth. However, what may be of interest in relation to the AC is those subjects that are deemed *fundamental* in the primary and middle years of schooling, and, in particular, those subjects that aspire to give students the skills and technologies necessary to be successful at school, as well as to prepare for life and work beyond school. The set of subjects presented for the BCC is not dissimilar, and a rating of *limited* applied to the Social Sciences at Grade 2 is also noted.

Table 3.4 *Subjects by Rigour: Moderate*⁵

Year/Grade	Australian Curriculum	British Columbia's New Curriculum
2	Science Humanities and Social Sciences Technologies Health and Physical Education	Arts Education Applied Design, Skills & Technologies Physical and Health Education Second languages, Italian
6	Science Humanities and Social Sciences Health and Physical Education	Arts Education Science Social Studies Physical and Health Education
10	Science	Social Studies Second languages, Italian Physical and Health Education

⁵ The draft BCC: Mathematics Grade 10-12 was in preliminary form at the time this comparative study was undertaken. Findings for breadth, depth and rigour have not been included for BCC: Mathematics Grade 10.

General Capabilities and Cross Curriculum Perspectives

In addition to comparison of the discrete learning areas, a comparative analysis was also undertaken of the AC *General Capabilities* and the BCC *Core Competencies*. The AC promotes seven General Capabilities; BC's new curriculum acknowledges three Core Competencies in every learning area. While there is not an exact match between the two curricula, as shown in Table 3.5, it is possible to determine how, and to what degree, the AC and BC curricula intend students to master the skills that they will need for participation in their post-school world.

Table 3.5 *Australian Curriculum General Capabilities matched to British Columbia Core Competencies*

Australian Curriculum	British Columbia's New Curriculum
Personal and Social Capability	Positive Personal and Cultural Identity Personal Awareness and Responsibility Social Awareness Communication Competency
Critical and Creative Thinking Capability	Thinking Competency
Literacy	NA
Numeracy	NA
ICT Capability	NA
Intercultural Understanding	Positive Personal and Cultural Identity
Ethical Understanding	NA

The analysis of these two components of the AC and BCC shows that:

The AC Capabilities and the BCC Core Competencies both strive to provide a framework for young people to develop skills, dispositions and aptitudes necessary for an uncertain world. Both frameworks focus on the development of inter and intra personal skills and critical and creative thinking skills. British Columbia Core Competencies focus on developing communication skills which are not an explicit capability within the Australian Curriculum, although the skill is developed in various ways within all capabilities.

The AC General Capabilities includes continua of learning addressing skill development in the areas of Ethical Understanding, Intercultural Understanding, Literacy, Numeracy and ICT Capability. These skills are not emphasised to the same extent in the BCC.

Additionally, comparison of the AC and BC's new curriculum includes consideration of indigenous learning. The AC's Cross-Curriculum Priority, Aboriginal and Torres Strait Islander Histories and Cultures, has a counterpart in BCC's Aboriginal Knowledge and Perspectives. Reflecting its key position in the overall design of the BCC, the latter is judged to be strong in breadth, depth and rigour. Analysis of the presence of the Cross-Curriculum Priority in the AC does not reveal the same level of integration across learning areas.

3.5. Discussion

The balance between breadth and depth is central to curriculum design, with recent research suggesting that in a 21st century curriculum depth should be prioritised over breadth (Masters, 2015). For some time, there has been concern that providing students with some knowledge about a range of topics can lead to a *mile-wide, inch-deep* curriculum, and that

while the mastery of factual and procedural knowledge is deemed essential in all school subjects, this knowledge should be organised around core concepts or 'big ideas' of the discipline (Erickson & Lanning, 2014; Bransford, Brown & Cocking, 1999; Taba, 1962).

The theoretical framework that underpins BC's new curriculum arguably privileges depth over breadth. In progressing a concept-competency based curriculum, the Ministry of Education and its teachers have engaged in a strong collaboration. The Ministry has high confidence and trust in the capacity of its teachers to continue to provide a high-quality learning experience for a diverse student population. Notably, teachers in British Columbia are not governed by national or provincial performance standards. BC's students are tracking well, and there is a view that BC will maintain its status as a top-performing system, particularly in relation to international assessment programs.

This comparative study has found that the AC focuses on a balance of depth and breadth, with some tendency towards breadth. Officially, the AC strives for a rigorous, in-depth study, preferring depth to breadth wherever a choice needs to be made, with consideration also being given to the overall teaching and learning time available (ACARA, 2016a). In its language and format, it provides detailed descriptions of what students should learn and the quality of learning expected of them as they move through their schooling. Australian schools use teachers' professional knowledge that is reflective of local and state contexts, taking into consideration the diverse nature of the student population (ACARA, 2016a). Australia's students are performing above the OECD average; however, in the last decade, a growing proportion of students is performing below the national average and there are concerns about a lack of engagement.

Both curricula aspire to prepare students for post-school expectations in the 21st century; it is arguable that the two jurisdictions approach curriculum design differently but with the same end in mind. The BCC is informed by Big Ideas that provide an overarching guide to students and teachers and complement the Curricular Competencies that aim at 21st century learning. As this study verifies, BC's flexible curriculum prescribes less and enables more, for both students and teachers ... that will best serve [them] for their futures (and) based on a curriculum that prescribes fewer but more important outcomes (BCME, 2012, p. 2).

Ongoing debate about curriculum design indicates that the claim of *less is more* may not yet be universally accepted as a key principle of curriculum design. This comparative study, for example, reveals a content-rich and highly prescriptive AC distinguished by disciplinary knowledge, skills, and understandings. Across and within the subject areas, the content descriptions and elaborations are quite detailed, supported by the General Capabilities and Cross-Curriculum perspectives that are developed throughout each subject area. Fewer content descriptions and elaborations are evident across and within the subject areas in the BCC.

This comparative study reveals evidence of 21st century learning skills in the AC, which are generally embedded in the elaborations and/or reinforced in the General Capabilities. These skills are not developed to the same degree within the BCC. The AC achievement standards detail what students are expected to do as a consequence of subject-specific teaching. BC's departure from a prescribed curriculum delivers fewer learning standards that privilege approaches such as flexible learning and inquiry-based learning and promote problem-

solving across and within disciplines. Teachers are encouraged to personalise learning and promote deeper engagement with learning driven by the Core Competencies.

This study proffers the view that breadth and depth are equally important for a high-quality curriculum. Equally, the study reinforces the obvious conclusion that both, or any, curricula depend on the ability of classroom teachers to ensure students engage with rigorous learning activities that build knowledge and skills that will equip them for the future.

3.6. Curriculum comparison templates by learning area / subject / dimension

a) English

Comparative Curricula

Australian Curriculum: English

British Columbia Curriculum: English Language Arts

Year/Grade Level

Australian Curriculum: Year 2

British Columbia Curriculum: Grade 2

Learning Area/Subject

Australian Curriculum: English (AC: E)

British Columbia Curriculum: English Language Arts (BCC: ELA)

Expectations: Knowledge and Skills

The AC: E at Year 2 level builds on concepts, skills and processes developed in earlier years. The strand and sub-strand organisers support the recursive nature of English learning while the content descriptions describe the acquisition of knowledge, skills and understandings expected at Year 2. The content descriptions are supported by elaborations which provide suggested learning experiences for the content descriptions; there is considerable variation in the specificity and breadth of coverage. The Achievement Standard conceptualises the learning from the content descriptions and indicates the quality of learning, in the recursive aspects of the curriculum, that students should typically demonstrate by the end of Year 2. The broad language means some dependence on the accompanying work samples to provide a line of sight to the content descriptions and a meaningful picture of the expected standard. For example, the Year 2 Achievement Standard, which states that students make connections between texts by comparing content or they listen for particular purposes, is a series of statements that could apply to any year level and becomes meaningful once contextualised by the student work samples and content descriptions. Through study of the AC: E, Year 2 students read texts and monitor for literal and implied meaning and self-correct using a range of decoding and comprehension skills. They create spoken and written texts to express ideas or relate experiences using some topic-specific vocabulary, thereby developing understanding of grammar, spelling and vocabulary.

The Grade 2 BCC: ELA develops students' knowledge of English through the content statements, which can then be applied to expand knowledge and develop skills through many of the Curricular Competencies. Together, the knowledge and competencies build toward the key principles of English development described in the Big Ideas. In Grade 2, the Big Ideas and the Curricular Competencies have a strong emphasis on the concept and use of *story*. In Grade 2, students study texts to develop knowledge and understanding of the forms and features of stories and to use those stories to develop understanding of self. The critical role of story in relation to culture, self-awareness and identity is reflected in five of the six Big Ideas in Grade 2. Whilst the Big Ideas offer an overarching description of the understandings that students should develop, the content descriptions and competencies that describe the knowledge and skills students need to inform their thinking are often broad

and lack specificity. Even with the help of the elaborations, teacher expertise in the continuum of English learning and the expected standard for Grade 2 is essential. For example, one content statement is simply elements of story and the elaboration is a list of story elements such as character, plot and setting, with no supporting information about the depth of knowledge students are expected to acquire. The corresponding competency recognises the structure and elements of a story that have supporting detail about the role of story and the purposes of stories, but no elaborations are provided regarding the application of knowledge of story elements to understand and use stories.

Both curricula are premised on the notion that many English concepts or skills are introduced in the early year levels and are revisited, strengthened and extended at later year levels. Both set broad and balanced goals that include a focus on literacy and fundamental English skills such as grammar and spelling. The AC: E is more explicit and detailed in its expectations, particularly in the knowledge and use of spelling, grammar, text structure and punctuation, with fourteen statements detailing what students are expected to know and a further eleven statements which describe how students will use these skills to understand and create texts.

The BCC: ELA has four content statements relating to language features, structures and conventions and a further twelve competency statements which provide opportunities for students to apply these skills. Both curricula encourage teachers to use a wide range of engaging and grade-appropriate text types. Notably, the BCC: ELA includes a detailed expectation that students will study First Peoples texts to understand the pivotal cultural and social role of story-telling. This reflects the view that all human beings tell stories and that these are important, regardless of cultural or other origins. The BCC includes the central premise that students' self-awareness and understanding of their relationship to the broader world is developed through the study of English, particularly through stories. The AC: E expects students in Grade 2 to form opinions both about fiction and non-fiction texts and develop some understanding of the cultural and historical contexts in which texts are created, but foremost is the focus on development of literacy skills.

Measurement of Curriculum: Breadth, Depth and Rigour

	BREADTH			DEPTH			RIGOUR		
	Limited	Fundamental	Comprehensive	Limited	Fundamental	Challenging	Limited	Moderate	Challenging
AC									
BCC									

AC – Breadth

Breadth: Comprehensive

For students in Year 2, the expectations of the AC: E are **comprehensive** in relation to breadth of coverage. The three strands of Language, Literature and Literacy form an integrated framework of disciplinary knowledge, understanding and skills. Multiple content descriptions enable students to experience comprehensive coverage of the receptive and productive modes of *listening, speaking, reading, writing, creating* and *viewing*; there are eighteen descriptions in Language, seven in Literature and eleven in Literacy. Comprehensive coverage of the modes is supported by 90 elaborations of the Content

Descriptions. Year 2 teachers can access additional suggestions designed to help students understand, develop and demonstrate the relationship between language and texts, including knowledge of phonics, vocabulary, spelling and punctuation, expression of ideas and examination of literature.

BCC – Breadth

Breadth: Fundamental

Six Big Ideas inform the BCC: ELA area of learning; a comprehensive combination of 13 Content elements and 14 Curricular Competencies, together with their elaborations, describe core knowledge and its application. In Grade 2, the Big Ideas emphasise story as the vehicle for developing conceptual understanding of language and identity. Grade 2 students are exposed to the receptive and productive modes of listening, reading, viewing and writing, speaking and representing. Coverage of key aspects of literacy development, including spelling and grammar, is relatively limited.

AC – Depth

Depth: Challenging

For students in Year 2, the expectations of the AC: E are **challenging** in relation to depth of coverage. Learning is structured so that students initially acquire knowledge about specific aspects of English such as grammar, spelling and syntax and then apply this knowledge both to understand and create their own texts. Deeper learning occurs when knowledge is classified, transferred and applied in a range of contexts. Understanding context is a central concept in the AC: E, which continues to expand and develop across year levels. In Year 2, students are introduced to the concept of *context* and are required to apply their elementary understanding of context to recognise how meaning can be influenced in texts. This expectation extends their thinking beyond superficial levels of understanding and encourages them to develop a deeper appreciation of the construction of text.

Most of the content of the curriculum develops the students' capacity to interpret and use language features, forms, conventions and text structures in imaginative, informative and persuasive texts. As students interpret a range of texts they are consciously selecting and applying skills and knowledge to deepen their understanding not only of the ideas or message in a text but also of the author's craft. Clearly stated within the content is the expectation that students will learn to draw inferences, compare and contrast ideas and explain conclusions and preferences they have drawn. Students are expected to engage deeply with all aspects of the text, particularly in the case of multimodal texts, to synthesise the various features. In Year 2, the instructional texts selected by teachers are critical to ensuring depth of learning.

BCC – Depth

Depth: Challenging

For students in Grade 2, the expectations of the BCC: ELA are **challenging** in relation to depth of coverage. Depth of learning in the BCC: ELA is reinforced in a similar way to the AC: E, in that fundamental knowledge about language learned through the content points is necessary for students to access and achieve the Curricular Competencies and Big Ideas

where the opportunities for learning at a deeper level are provided. The descriptions of knowledge about language to be acquired in Grade 2 are brief, with a limited number of elaborations, and they rely on teacher knowledge and understanding of the continuum of English language development to support depth of learning. In the design of the BCC: ELA there is deliberate, built-in flexibility to support deeper learning. This open curriculum design allows scope for richer, deeper learning but relies on teachers skillfully crafting teaching programs to ensure students learn and integrate the key concepts and understandings described in the Big Ideas. A key underpinning competency in the Grade 2 curriculum is on developing personal and social capabilities through English, focusing on students' ability to use texts as tools to influence their own behaviours and attitudes and to broaden their understanding of the world.

AC – Rigour

Rigour: Challenging

The recursive structure and nature of the AC: E is the main reason for evaluating its level of rigour as **challenging**. In Year 2, much of the curriculum is built around understanding how aspects of the language function in different contexts and purposes, rather than simply knowing and being able to identify language forms and features. The emphasis in the achievement standard for Year 2 is on the discriminating use of knowledge and skills to support meaning, as students are either using texts or developing texts. The expectations of accuracy in language use by the end of Year 2 are very rigorous. At this stage, students are also expected to be more independent in their language choices and to demonstrate that they can transfer learning to a range of contexts. Much of the content in the Literature and Literacy strands requires students to use a range of skills in appropriate sequence to demonstrate their understanding. Students are often required to source and formulate ideas, articulate these ideas, modify them in response to the reaction of others and finally defend their choices. Invoking a range of higher- and lower-order thinking skills involves rigorous learning.

BCC – Rigour

Rigour: Challenging

For students in Year 2, the expectations of the BCC: ELA are also **challenging** in relation to rigour. Rigour is evident in the BCC: ELA where a balance between skill development (for example, writing sentences, developing conceptual understanding such as the portrayal of human behaviour) in the production of texts and application of skills and knowledge is built into the design. As with the AC: E, it is through the application of teachers' skills in selecting and balancing instructional practices that this level of rigour will be realised most successfully.

The curriculum is clear about the intentions for student learning and how this is to be measured. Within the content, some statements explicitly address rigour in that they ensure comprehensive and analytical coverage of some of the key components of English. However, other content statements are less definitive and reveal greater reliance on the skill of teachers to overlay and interrelate the Big Ideas with the Curricular Competencies, if rigour is to be achieved. For example, one Big Idea refers to students using curiosity and wonder to make discoveries about themselves and the world. It is apparent that if notions of

curiosity and *wonder* can be harnessed to enable students to demonstrate awareness of the cultural and social significance of story in First Peoples' cultures, and to exchange ideas and perspectives respectfully and thoughtfully, the intended rigour in the curriculum can be realised. These are rigorous expectations.

Comparative Analysis

Although the aims and design principles of the BCC: ELA presented some clear differences from those of the AC: E, a comparative investigation of the two curricula at Year 2/Grade 2 level suggests a high level of convergence in content and expected student learning. In general, and for English Language Arts as well, a more minimalist and flexible approach underpinned the development of the BCC. At Grade 2, there is still a solid focus on developing knowledge about language, but the knowledge is considerably less prescriptive than in the AC: E language strand. The structure of the BCC: ELA, emphasising key concepts and Big Ideas, is in clear contrast to the three-strand structure (language, literacy, literature) of the AC: E. Although the structures are different, each attempts to align content and learning standards and each highlights the acquisition of English as a recursive process, with similar knowledge and skills addressed at different levels and with obvious, increasing demands in relation to rigour and depth.

An important point of similarity between the two curricula is the intent to engage with Aboriginal culture and traditions, and to ensure the curricula meet the needs of Aboriginal learners. The AC values, respects and explores Aboriginal and Torres Strait Islander Peoples' contribution to Australian society and to its contemporary literature and its literary heritage through their distinctive ways of representing and communicating knowledge, traditions and experience. In British Columbia, the curriculum is emphatic about the integration of First Peoples Principles of learning and Aboriginal knowledge and world views. This focus on Aboriginal learning and culture is not a common theme in English curricula internationally, so its presence in the AC: E and BCC: ELA suggests that both curricula value cultural context and an inclusive approach to language learning, as a part of learning English.

Encouraging students' engagement with academic content and ensuring that they have a solid grounding in fundamental language and literacy skills are stated intentions of both curricula. Both are premised on learning about the features of language and the use of this knowledge to comprehend and analyse a wide variety of text types and forms. It is at the point of the purpose of developing this understanding of texts that the two curricula diverge. The AC: E emphasises the role of English in building knowledge and skills in the speaking, listening, reading and writing modes that can be applied across all learning areas as well as for a growing appreciation of literature, whilst the BCC: ELA prioritises *story* as the vehicle for developing personal and cultural identity.

Both curricula expect students to learn and use a range of decoding strategies, with the youngest learners working with phonics. However, the specific phonic knowledge and skills students are expected to demonstrate are more carefully defined in the AC: E.

Knowledge and understanding of text structures and features are included in both curricula; some of the learning, such as navigation of a screen layout and recognition of the features of different types of texts is almost identical. In relation to knowledge and understanding, the cognitive demands of some aspects of the AC: E are greater. For example, both curricula

include compound sentences as new learning for Year 2, but the AC: E expects students not only to recognise and write compound sentences, but also to describe their purpose and application.

Some differences are seen in the cognitive demands of the two curricula, particularly among those aspects that go beyond identifying, recalling or recounting and expect sophisticated levels of thinking. Both curricula describe speaking and listening behaviours, such as the skills involved in taking turns in discussions, but the key purposes of talking and listening in the curricula are not aligned. In the AC: E, for example, students' listening skills are developed with a focus on active participation in discussions where they are expected to analyse, compare and contrast information in order to develop and extend their own knowledge. The BCC: ELA expects students to adopt open-minded listening strategies to question what they hear and, in particular, to connect with personal knowledge and experience. BCC: ELA's emphasis on personalising the context for learning, rather than embedding language learning in cross curriculum content, is a clear point of contrast between the two curricula.

Both curricula address text composition as a point-in-time developmental stage drawn from a continuum of skills and understandings that begins on entry to school and continues throughout successive years of schooling. In this regard, the statements referring to writing in both curricula lack specificity and rely heavily on teachers' ability to interpret qualitative language to realise the writing expectations at this grade level. Both provide limited detail and clarity by way of content statements and learning descriptions, suggesting significant dependence on teachers' familiarity with the curriculum of the previous two years as well as that which is to follow, if there is to be a strong understanding of the expected standard.

Both curricula have deliberately steered away from a more traditional mode-based structure, with the intent that learning will occur across modes and students will develop understanding of their interconnectedness. The AC: E and BCC: ELA expect students to learn a battery of similar skills in reading, speaking and writing. However, neither curriculum provides detailed support for teachers to guarantee transfer of this knowledge to actual application, when students are expected to read or write independently. The key step of learning to transfer discrete component knowledge of a skill or strategy to demonstration of its application is not made explicit in either curriculum, although the expectation that this will occur is implicit. When appropriate, what students learn about a text from reading and studying should be transferred and demonstrated in the texts they produce. Effective teachers are able to make seamless connections between the modes as they lead instruction in reading, listening, speaking and writing; neither curriculum provides strong guidance for teachers to ensure that this occurs. If students are not able to conceptualise language learning both as holistic and skill-based by Year 2, important opportunities for deep and rich learning could be missed, and there are obvious implications for the learning that is expected to follow across all learning areas.

Exploration of the aesthetic domain of language use and understanding is a focus in both curricula, with the AC: E expecting students to engage with a variety of texts for enjoyment. However, the concept of *enjoyment* is unpacked into more specific responses to both literary and non-fiction texts, demanding analytical and critiquing skills to form the basis of an informed, critical opinion of a text. Students make comparisons of features of texts, connect with the feelings of characters and describe features of humorous texts in order to form

personal preferences in reading. This detail about how students will respond to texts assists the development of informed, critical opinions that rely on the use of evidence; it also provides a framework for teachers to develop assessment tasks. The BCC: ELA takes a more affective approach, requiring students to work closely and extensively with *stories* to make connections to community and culture, to develop a sense of personal identity and to see stories as the embodiment of collective wisdom. Developing a deep understanding of story is the consistent method adopted by BCC: ELA for developing thinking skills as well as personal and social connections to self, family and community. Self-reflection and individualism are also powerful themes and story plays a vital role in developing these skills. These different approaches to literary texts are notable points of divergence between the two curricula.

Year/Grade Level

Australian Curriculum: Year 6

British Columbia Curriculum: Grade 6

Learning Area/Subject

Australian Curriculum: English (AC: E)

British Columbia Curriculum: English Language Arts (BCC: ELA)

Expectations: Knowledge and Skills

By Year 6, Australian students draw upon an array of communication skills which they can adapt to a wide range audiences and purposes. They are expected to analyse and explain how language, images and vocabulary can represent ideas, characters and events and they create detailed texts elaborating on key ideas for a range of purposes and audiences, using evidence to justify a position. The AC: E places a strong emphasis on grammar, spelling and language structures and features for application across all learning areas. Year 6 students have also moved to a greater emphasis on the application of knowledge through reading, creating texts, speaking and listening. They engage with texts that broaden their understanding of the world and critically evaluate aspects of the world that impact upon them. By this stage, they are also beginning to consider the role and influence of media.

In Grade 6, the Big Ideas that support conceptual understandings in the BCC: ELA emphasise development of personal and social competencies through the study of English, particularly empathetic understanding, self-awareness and respect for First Peoples culture. The Big Ideas have moved from a highly personalised relationship with language to an approach where students are applying critical thinking to analyse and evaluate texts, though they still value *joyful* interaction with text. The importance of story as a vehicle for understanding identity remains threaded both through the Curricular Competencies and the Content but there is an expectation that Grade 6 students will have developed understanding of story and be able to analyse and evaluate stories. Grade 6 elaborations are more expansive than those at Year 2 but are still largely definitional, rather than providing support for teachers to implement the curriculum. Many of the Curricular Competency statements are broad and open-ended, to support the flexible approach that underpins the entire BCC: ELA.

The two curricula are broadly comparable in their expectations of what students will read and write. The BCC: ELA places more weight on the explicit development of discursive and collaborative interaction, although speaking to learn is clearly expected within the AC: E.

While both curricula begin with the principles of learning about language and then applying knowledge and skills to understand and create texts through reading, writing, speaking and listening, the AC: E is more explicit in describing which language features, forms and structures that students will learn. It also places greater emphasis on understanding and creating persuasive texts.

Measurement of Curriculum: Breadth, Depth and Rigour

	BREADTH			DEPTH			RIGOUR		
	Limited	Fundamental	Comprehensive	Limited	Fundamental	Challenging	Limited	Moderate	Challenging
AC									
BCC									

AC – Breadth

Breadth: Comprehensive

For students in Year 6, the expectations of the AC: E are comprehensive in relation to breadth of coverage. By the end of Year 6, students understand and create a range of multimodal texts for clearly defined purposes and investigate and evaluate a range of texts which enable them to expand their knowledge and form opinions on a range of real-world and imaginary topics. There are twelve content descriptions in the Language strand, fewer than in Year 2, reflecting the expectation that this cohort will have control over a broad range of decoding, spelling and grammatical skills but will continue to develop their understanding of text structure, more complex sentence structures and language features. In the Literature strand, seven content descriptions describe how students’ skills in appreciating, responding to, analysing and creating literary texts build throughout the primary years. These content statements follow a developmental path as students expand and deepen their understanding of the structure, features, devices and purposes of literary texts and use this expanded knowledge to create their own texts. Eleven Literacy content descriptions describe how students should apply the increasingly sophisticated knowledge from the Language strand to listen to, read, comprehend and create texts using both conventional and digital tools.

BCC – Breadth

Breadth: Fundamental

The BCC: ELA provides **fundamental** coverage for students in Grade 6. Through its five Big Ideas, the Grade 6 BCC: ELA continues to use stories as key texts to develop self-awareness and to make personal and social connections with the broader world. By Grade 6, the Big Ideas encourage students to adopt a more analytical approach, with the expectation that students will develop skills in evaluating multiple perspectives to make informed personal choices and begin to consider their role as citizens. The Grade 6 curriculum includes fifteen content statements which describe the core knowledge about text structures, forms and features and the oral, reading and writing strategies students will learn to use. The fourteen curricular competency statements describe how students will apply the knowledge to comprehend and make connections with texts and create spoken, written and digital texts. Underpinning the content and Curricular Competencies are six Big Ideas which

describe the understandings of concepts that students will develop through study of English Language Arts, including identity, diverse perspectives and cultural awareness.

AC – Depth

Depth: Challenging

The AC for Year 6 English teaches students to communicate for a range of purposes in a range of modes and forms. It also emphasises the deep thinking that occurs when students engage with or create texts; therefore, it is regarded as **challenging**. The curriculum makes clear that knowledge about language provides critical underpinning to meta-cognition, enabling students to make informed choices as they speak, listen, read and write. It develops students' knowledge and understanding of grammar, text structure and language features to support them to make appropriate choices when applying this knowledge to their own writing or when comprehending increasingly complex texts. Students are required to understand and use the forms and features of language with precision and relevance and to transfer knowledge to new and less familiar contexts, reflecting learning on a deeper level.

While students are expected to read a broad range of literature, the emphasis is on engaging deeply with texts by identifying themes and issues, recognising points of view and justifying interpretations by referring to their own knowledge, values and experiences. A key theme of the Year 6 curriculum is the use of language to persuade. Literature is studied not only for its aesthetic qualities and its language features but also for its role both in contemporary and historical contexts and in shaping and reflecting culture, extending students' understanding of the role of literature in culture. The Year 6 English curriculum supports deep learning as it requires students to use multiple strategies to understand, evaluate and create texts and to process layers of meaning to conceptualise ideas from texts.

BCC – Depth

Depth: Challenging

For students in Grade 6, the expectations of the BCC: ELA are **challenging** in relation to depth of coverage. Deep understanding is an aim in many aspects of the Grade 6 curriculum. Students are expected to analyse, evaluate, summarise and explain key ideas and messages in texts. As with learners of the AC, students in Grade 6 in British Columbia work with a number of texts to make comparisons and consider their relevance, accuracy and value. To build deeper understanding of a topic, students are expected to synthesise ideas from a variety of sources and apply critical and creative thinking to evaluate the ideas presented by particular texts, to make generalisations and to connect their ideas. Students must be able to support their thinking by selectively applying strategies and knowledge learned through the content to provide cogent arguments and evidence that demonstrate deep understanding of a topic or idea. To create spoken or written texts, students summarise information from multiple sources, including sources that present diverse perspectives on a topic or issue, and transfer this information into their own texts. The Grade 6 BCC: ELA supports deep learning as it requires students to use multiple strategies to understand, evaluate and create texts and make personal and cultural connections to texts.

AC – Rigour

Rigour: Challenging

Year 6 English in the AC is considered **challenging** in its expectation that students will study and create texts that demonstrate high standards of accuracy in features such as spelling and grammar as well as deep understanding of key ideas and topics. Students are expected to produce texts that reflect understanding of increasingly complex concepts. Rigour in the curriculum is derived from the way these learning processes challenge students' thinking in interesting and provocative ways. It occurs because the curriculum demands a sophisticated understanding and application of fundamental ideas where knowledge is taught to support students to confront and evaluate ideas and problems and to seek deeper and richer understandings.

The AC: E expects students to speak, listen, read and write to manage the general demands of the curriculum across all learning areas, not just in English. In Year 6, students focus on comprehending, processing and analysing both the content of a wide range of texts and the authorial strategies and techniques used in different types of texts.

BCC – Rigour

Rigour: Challenging

The Grade 6 BCC: ELA can be considered **challenging**. It is premised on six Big Ideas, of which at least three identify significant cognitive demand and provide a strong focus on exploring and questioning texts to develop deep understanding. As well as continuing a strong emphasis on the power of story and making connections between texts, the world and self, the curriculum now expands students' thinking to working with multiple perspectives and questioning materials they read and hear to support their role as educated citizens.

The Grade 6 Big Ideas reflect the broader BCC: ELA approach to preparing educated and engaged citizens who understand themselves and make connections to others and to the world. A rigorous understanding of the role of language in informing, persuading and cultivating cultural understanding is required to achieve these goals. This means linking the study of language to the development of personal identity and involving the students in rigorous self-appraisal. Several Curricular Competencies, such as *recognise how language constructs personal social and cultural identity*, expect students to investigate an author's choice of language as well as the different responses audiences may have to a text.

Many of the content statements in the curriculum are explicit in their expectation of rigour, such as those that require students to assess authors' choices, evaluate and compare texts, and write well-constructed arguments premised on logic and evidence. Within the Curricular Competencies, the extension and application of a range of thinking skills is explicitly required in such statements as think critically and creatively to explore ideas and synthesise ideas from a number of sources. Rigour is also realised through the emphasis on the need for students to make personal connections with text and to extrapolate those personal connections to understandings of culture, traditions and histories.

Comparative Analysis

As students complete their primary school education, they should be equipped with the knowledge, skills and understandings in all language modes needed for successful learning in the secondary years. An effective English curriculum requires students to construct

knowledge and select and use texts for a range of learning, social and personal purposes. It should expect that students have sound control over spelling, grammar, punctuation and sentence structure to enable them to independently create written and multimodal texts for a range of purposes. Their knowledge and understanding of language should enable them to communicate effectively for a range of purposes and to express well-developed, well-organised ideas and opinions about texts. In general, the AC: E is more explicit and detailed in describing what students should know and do, while the BCC: ELA, with its commitment to flexible provision and personalised learning, is more open to interpretation.

By Year 6/Grade 6, the recursive nature of language development is even more evident in both curricula, with student progress highly dependent upon prior knowledge, skills and understanding. The Australian and British Columbia curricula both retain the structure found in the earlier years, but the emphasis on acquiring crucial elementary skills and knowledge has shifted to the use and application of these skills in a greater range of contexts. Literacy is depicted as an essential criterion for learning; the examples, content statements and elaborations make it more evident in the AC: E that students' ability to work with and create texts in learning areas is essential for success across all learning areas.

The BCC: ELA favours terms such as *appreciates* and *explores* to describe student learning behaviours. This approach to curriculum design supports flexible delivery but also relies on teachers having a clear understanding of what the standards look like in practice to enable appropriate levels of depth and rigour. Although the AC: E content is more detailed and often includes extensive points of elaboration – up to four or five for some statements – it includes some statements, such as analyse author strategies, that require teacher expertise to be effectively implemented. A close examination of both curricula shows that it is easier to gain a salient picture of student learning from reading the AC: E at Year 6 level. The BCC: ELA requires an understanding of the way the elements of the curriculum work together and the underpinning philosophies of the BCC: ELA's overall expectations of learning.

A common goal is to equip students to reason independently, and to reflect and make sound and defensible decisions through the study of texts. Similar assumptions are made about students' ability to evaluate the structure, design, comparability, relevance, credibility and many other features of grade-appropriate texts.

Both curricula emphasise the study of literary works and the evaluation of the degree to which authors achieve their purpose. In essence, their similarities can be seen in terms of the skills and knowledge they emphasise and the application of these in reading, writing, speaking, representing and listening.

In addition to the overarching competencies common to both, each curriculum is nuanced to develop students' knowledge, skills and understandings in particular aspects of English that reflect their underpinning philosophies. Within the AC: E, the development of personal and social skills through the study of English is implicit in many of the content statements and made more obvious where the Personal and Social Capability is tagged to particular content statements. In contrast, the BCC: ELA foregrounds personal and emotional responses to texts with the use of personal pronouns such as *I* and *we* to highlight the curriculum's practice of speaking directly to students. The value placed on personalised and empathetic connections with texts is also emphasised. Beyond this, both curricula implicitly demand that

students become self-directed learners, effectively seeking out and using resources as needed, including collaboration with peers, and print and digital materials.

In the main, the strength of both curricula lies in the way the study of English is organised to encourage students to use their knowledge and understanding of the language to understand other perspectives and cultures and to communicate effectively with people who hold diverse opinions, often different to their own. Students are expected to evaluate ideas, information and other points of view critically and constructively. This is a strategy for learning that demands increasing intellectual and linguistic flexibility and sophistication, arguably an essential characteristic of an educated citizen.

Additionally, the AC: E and BCC: ELA both support students to use technology effectively. The AC: E requires students to compare content from a variety of textual sources, including media and digital texts, and the BCC: ELA expects students to successfully navigate digital media and consider how websites and advertisements are constructed using particular text elements.

Although the two curricula converge in their ultimate purpose and expectations, their points of difference are seen primarily in the way these are achieved.

Year/Grade Level

Australian Curriculum: Year 10

British Columbia Curriculum: Grade 10

Learning Area/Subject

Australian Curriculum: English (AC: E)

British Columbia Curriculum: English Language Arts (BCC: ELA)

Expectations: Knowledge and Skills

At Year 10, the Australian and British Columbia English curricula diverge significantly. Australian students complete their final year of compulsory study with the AC: E F–10 while Canadian students enter their first year of senior secondary study. Both curricula maintain the overarching organisational elements and key foci but they are quite different in their philosophical intent and purpose. Similarly, the structure and offerings vary markedly for this age group.

In Year 10, the AC: E continues to develop students' knowledge and understanding in the three interrelated strands of Language, Literature and Literacy through listening, reading, viewing, speaking, writing and creating. The learning builds on and strengthens concepts, skills and processes developed in earlier years.

British Columbia's secondary curriculum (Grades 10–12) is currently in draft, available for teachers to trial, until 2018. At Grade 10, there are two parallel curricula: English 10–12 and English First Peoples 10–12, which are designed to be academically equivalent. The English First Peoples 10–12 provides a deeper and more focused opportunity for all learners to encounter and study authentic First Peoples texts.

Within this parallel structure, students in Year 10 study two of five optional courses. The philosophical basis for this is to allow students to begin to pursue their interests, aspirations, and passions while further developing their general skills as English Language Arts learners. For example, in the Spoken Communication course, where the focus is on the development

of strong speaking and listening skills, students are also required to read, write, view and represent material from a wide range of contexts. Notably, the importance of strong literacy and language skills for post-secondary applications is recognised but not given equal weight in all of these courses.

The AC: E for Year 10 proposes to improve students' knowledge and understanding of language so that they can comprehend and create a comprehensive range of imaginative, informative and persuasive texts, in different forms, using various technologies. The influence of culture and perspective on language is a key theme in the Year 10 curriculum. The skills and knowledge developed in the curriculum are drawn together through the critical analysis of text, intended as a lens through which students consider their society and culture and those of others.

At this level, there is a shift away from the development of core literacy skills towards the study of literature for its intrinsic, aesthetic value as well as for its contribution to understanding human behaviour, cultures and global philosophical and real-world dilemmas. This change in emphasis from the primary years reflects not only the expectation that students will already have mastery over most essential literacy skills such as spelling, punctuation and paragraphing but also the perspective that, by the middle secondary years, the English curriculum should concentrate on the study of English as a discrete academic discipline and not simply an area of study that is responsible for equipping students with literacy skills.

The expectations of Grade 10 students studying the BCC: ELA are less defined than those of their peers studying the AC: E; the former continues to point to broad, high level understandings identified through the Big Ideas and goals. Students may complete their Grade 10 courses with deep and comprehensive knowledge and understanding of aspects of language whereas in other areas there may be very little defined expectation of development. There is an assumption that, by providing choice, students will find greater relevance in their study and teachers will have increased opportunities to foster deeper learning in areas most pertinent to their students. This continues the philosophy of the English curriculum from earlier years, during which students' personal connection with language is valued and encouraged.

Expectations of a strong grasp on essential literacy skills are inherent in the BCC: ELA courses, as they are in the AC: E. While some of the content described is similar to aspects of the AC: E, the expected standards tend not to be as well defined. For example, in BCC; ELA's Focused Literary Studies course. the expected learning is described in statements containing relatively limited detail such as think critically creatively and reflectively to explore ideas within, between and beyond texts. The same learning is captured in rather more detailed statements in the AC: E that describe the type of critical thinking and the contexts in which this would be applied. For example, the AC: E stipulates the use of critical thinking as ... *analysing implicit beliefs and assumptions and embedded perspectives in texts.*

Another point of distinction between the two curricula is BCC: ELA's specific reference to First Peoples texts, which are used as models of how values and perspectives can be represented in texts and used to teach narrative structure. Learning about the legal status of texts and the protocols for respectful engagement with texts – particularly First Peoples texts – is unique to the BCC: ELA. In Year 10, the AC: E does not specifically require students to

engage with Aboriginal and Torres Strait Islander cultures or texts. However, students are expected to review traditional texts and compare and evaluate a range of representations of individuals and groups in different historical, social and cultural contexts, which does give teachers scope for working with Aboriginal and Torres Strait Islander Histories and Cultures. Throughout the BCC: ELA, deep engagement with First Peoples texts and the exploration of the close relationship of text and cultural identity are prominent objectives at all year levels. Although Aboriginal and Torres Strait Islander Histories and Cultures is one of the three Cross-Curriculum Priorities in the AC, it is not as strongly embedded in the AC: E.

Measurement of Curriculum: Breadth, Depth and Rigour

	BREADTH			DEPTH			RIGOUR		
	Limited	Fundamental	Comprehensive	Limited	Fundamental	Challenging	Limited	Moderate	Challenging
AC									
BCC							Not Rated		

AC – Breadth

Breadth: Comprehensive

The extent of content covered in the Year 10 curriculum is considered **comprehensive**. By the end of Year 10, students understand and create a range of multimodal texts for clearly defined purposes and they investigate and evaluate a range of texts which enable them to expand their knowledge and form opinions on a range of real world and imaginary topics. In Year 10, there are twelve content descriptions in the Language strand, with most of these building on knowledge and understandings from previous years. The number of content descriptions in the Literature strand has expanded to ten, reflecting the increased emphasis on analysing, appreciating and critiquing literature in the secondary curriculum. These content statements follow a developmental path throughout the primary years, as students broaden and deepen their understanding of the structure, features, devices and purposes of literary texts and use this expanded knowledge to create their own texts. There are eleven Literacy content descriptions which describe how students are able to apply the increasingly sophisticated skills from the Language strand to listen to, read, comprehend and create texts, using both conventional and digital tools.

BCC – Breadth

Breadth: Comprehensive

The BCC: ELA is organised into courses that offer comprehensive coverage. The consequence is that students select from the choices offered in the two strands and twenty courses, thereby defining the actual breadth of learning. The curriculum recognises that student choices may narrow the breadth of learning but states that the wide range of course choices provides the flexibility for schools to offer courses that best suit the needs of their communities. The design of the curriculum accommodates coverage of the broad goals of English Language Arts, regardless of which courses students choose to study. Students become aware that texts are socially constructed and influenced by place and history, whether they develop this understanding through focusing on digital texts in the New Media course or working mainly with oral texts in the English First Peoples Focused Literary Studies course. All courses continue to develop the overarching goal of the curriculum: using

English as a tool to learn about society and, in the secondary years, to take an active role in shaping society as educated citizens. Within the course options, there is commonality across some of the Big Ideas, with *story* remaining central to the curriculum. Although the senior years' curriculum states that students will continue to develop strong communication skills and an understanding and appreciation of language and literature, the way this is achieved could be quite variable, depending on the course choices made by students.

AC – Depth

Depth: Challenging

The Year 10 AC: E is deemed to be **challenging**, based on the rich core content that is considered foundational to a strong secondary curriculum. The Year 10 AC: E builds on the knowledge and skills developed in previous years and deepens and expands conceptual understandings about language and literature. By Year 10, the curriculum requires students to analyse and critique a range of quality literary, media and digital texts that provide insights into society, culture and politics. This is achieved through deep knowledge of structures, forms and devices. By Year 10, students are analysing complex English concepts such as *intertextuality* and *voice*, involving application of deep, specialised knowledge.

BCC – Depth

Depth: Fundamental

British Columbia's Big Ideas are the key to students engaging in deep learning, but the Grade 10 Big Ideas do not suggest the same depth or demand the rigorous critical thinking that the AC: E expects. In relation to depth, the curriculum is described as **fundamental**. The Big Ideas consist of generalisations and principles, and the key concepts important in an area of learning reflect the *understand* component of British Columbia's *Know-Do-Understand* model of learning. The Big Ideas represent what students will understand at the completion of the curriculum for their grade and they are intended to endure beyond a single grade and contribute to future understanding. Designed to be the generalised learning principles in all the BCC: ELA courses, they are vital links to the learning from previous years.

The Grade 10 Big Ideas, such as recognising that all texts have a social construct and that the perspective of individual readers or viewers of texts influences their understanding are similar in nature to the concepts developed in the AC: E in earlier years, that enable Year 9 students in Australian schools to recognise, interpret and challenge perspectives represented in texts. This capacity should be based on the understanding that all texts are built from a particular perspective and that personal perspective invariably and inevitably positions the reader or viewer.

AC – Rigour

Rigour: Challenging

The level of rigour expected in the AC: E is evident in the encouragement to students to produce a broad range of sustained texts that develop well-reasoned arguments and respond to counter-arguments. Students create texts about **challenging** academic concepts or issues from multiple perspectives, including different cultural perspectives and with a focus on the Asian region. In the AC: E, there is an expectation that students' written texts will be expansive and complex, and that they will have an impact on the reader.

BCC – Rigour

Rigour: Not rated

The expectations of students in the BCC: ELA are not detailed enough to allow an assessment of rigour. The BCC: ELA commitment to flexible offerings also makes it difficult to judge the level of rigour for this particular cohort. If the Composition Year 10 course is used as an example, students are required to express an opinion or viewpoint with evidence that could be either rigorous or superficial, depending on the expectations set by the text and the demands of the task. For example, a statement such as demonstrating skill characteristic of writers has the potential for poorly crafted texts to meet the curriculum standard. The teacher's ability to interpret the curriculum supports rigorous development of aspects of the curriculum according to student need, but the success of the curriculum is highly dependent on teachers setting the standard for Grade 10.

Comparison of AC: Creating texts content area for writing and BCC: Composition, Year 10

By Year 10, Australian students are expected to be able to construct sustained texts for a range of purposes that address challenging and complex issues. Their writing should reflect an emerging sense of personal style, use of appropriate structure and use of language and literary devices and features which have been selected specifically for the intended audience.

The BCC: ELA Composition Year 10 course develops students' skills in written communication. The course requires students to explore and create coherent, purposeful compositions through processes of drafting, reflecting and revising to create texts that demonstrate breadth, depth and evidence of writing for a range of situations.

Both curricula are built on the implicit understanding that students have, by now, become reasonably independent writers. Instruction is centred on writing techniques that allow students to craft and refine their writing for very particular purposes. For mastery of the content in either curriculum, students must be proficient in the fundamentals of writing, be able to plan, draft and edit, be skilled in accessing and applying research material and be able to select and use language forms and features in precise and accurate ways.

This ongoing development of the craft – or art – of writing is evident from the early years of both curricula and exemplifies the recursive nature of both curricula, in all areas of English. An important difference is that, in the AC: E, all aspects of creating texts are featured in the holistic curriculum; in BCC: ELA aspects of writing development are filtered into dedicated courses. BCC: ELA's Composition Year 10 aspires to develop skills in many types of written communication. However, it does not continue the development of all writing content from the single BCC: ELA for Grade 9. For example, sentence fluency is not included, whereas this features in the Grade 8 curriculum and at every year level in the AC: E. In the Creative Writing course, the development of writing conventions is not evident, although these feature in the earlier sections of the curriculum.

Composition Year 10 maintains the main structural elements of the BCC: ELA of earlier years with the overarching Big Ideas, Content and Curricular Competencies remaining the organisers and the Content statements now privileging knowledge about writing. The course competencies include reading and viewing texts to develop knowledge of the features

represented in a range of texts, particularly regarding authors' representation of perspective and personal and social identity in text. Three of the Big Ideas are about engaging with texts to further understanding of identity and the way personal and cultural identities influence the reader's response to the text. The AC: E recognises the role played by a reader's personal value systems but the emphasis is more on how texts influence the reader in a range of contexts rather than on the reader or viewer's sense of self. Wide reading for critical analysis is not a prominent feature of the expected learning.

A clear emphasis on knowing and understanding texts before attempting to write them is a point of difference between the AC: E and the BCC: ELA; that is, although reading through the lens of a writer is important in the AC: E, it is not given the same prominence as in BCC: ELA. The AC: E continues to expect students to deconstruct texts with a view not only to understanding and critiquing the content but also to evaluating authorial choices. There is recognition of cultural expressions and personal enjoyment in the AC: E; however, informed and critical reading, to recognise and understand how texts position the reader, is the intent. In contrast, the BCC: ELA prioritises the relationship of text to self and personal identity.

b) Mathematics

Comparative Curricula

Australian Curriculum: Mathematics

British Columbia Curriculum: Mathematics ⁶

Year/Grade Level

Australian Curriculum: Year 2

British Columbia Curriculum: Grade 2

Learning Area/Subject

Australian Curriculum: Mathematics (AC: M)

British Columbia Curriculum: Mathematics (BCC: M)

Expectations: Knowledge and Skills

The AC: M aims to be relevant and applicable to the 21st century by equipping students with the capacity to think, solve problems and respond to challenges. The inclusion of the proficiencies of understanding, fluency, problem-solving and reasoning in the curriculum enables students to respond to familiar and unfamiliar situations by employing mathematical strategies to make informed decisions and solve problems efficiently. The proficiencies define the range and nature of expected actions and applications in relation to the content descriptions. The proficiencies are an integral part of Mathematics content across the three content strands: Number and Algebra, Measurement and Geometry, and Statistics and Probability. They reinforce the significance of working mathematically within the content and describe how the content is explored or developed. They also provide the language to build in the developmental aspects of the learning of Mathematics and outline the expectations of the teaching of mathematical content in Year 2.

At this year level:

- **understanding** includes connecting number calculations with counting sequences, partitioning and combining numbers flexibly and identifying and describing the relationship between addition and subtraction and between multiplication and division
- **fluency** includes readily counting numbers in sequences, using informal units iteratively to compare measurements, using the language of chance to describe outcomes of familiar chance events and describing and comparing time durations
- **problem-solving** includes formulating problems from authentic situations, making models and using number sentences that represent problem situations, and matching transformations with their original shape
- **reasoning** includes using known facts to derive strategies for unfamiliar calculations, comparing and contrasting related models of operations and creating and interpreting simple representations of data.

The AC incorporates content across the three strands of Number and Algebra, Measurement and Geometry and Statistics and Probability. Elaborations are aligned to each content

⁶ The draft BCC: Mathematics Grade 10-12 was in preliminary form at the time this comparative study was undertaken. Findings for breadth, depth and rigour have not been included for BCC: Mathematics Grade 10.

description but are not mandatory for teachers to teach. The elaborations support teachers to clarify the content and offer suggested teaching strategies. By the end of Year 2, students count to and from 1000 and recognise increasing and decreasing number sequences. They perform simple addition and subtraction calculations using a range of strategies and represent multiplication and division by grouping into sets. Year 2 students learn to divide collections and shapes into halves, quarters and eighths and associate collections of Australian coins with their value. Students learn to identify the missing element in a number sequence and order shapes and objects using informal units. They are required to tell time to the quarter-hour and use a calendar to identify the date and the months included in seasons. They draw two-dimensional shapes, recognise the features of three-dimensional objects, explain the effects of one-step transformations and interpret simple maps of familiar locations. Year 2 students describe outcomes for everyday events and collect, organise and represent data to make simple inferences and make sense of collected information. The proficiencies underpin the learning of Mathematics and examples of where they occur in the curriculum are described at the beginning of the year in a year level statement. The AC mandates that the content descriptions to be taught. Elaborations are available to be used by teachers to exemplify the curriculum content; they do not constitute a mandatory feature.

The BCC: M encompasses five Big Ideas representing content contained in Number, Measurement, and Data. There is evidence of the development of computational fluency in addition and subtraction with numbers to 100 which requires an understanding of place value. Grade 2 students identify the regular change in increasing patterns that can be used to make generalisations. They describe the attributes of objects and shapes that can be measured and compared. Students use concrete items which can be represented, compared, and interpreted pictorially in graphs. The elaborations support these Big Ideas and offer further detail to enhance possible additional learning. The Core Competencies of Communication, Thinking and Personal and Social underpin the curriculum. Sample questions are provided to support inquiry for each of the number, fluency pattern attributes and graphs. Curricular Competencies of reasoning and analysing, understanding, solving, communicating and representing are expanded to identify what students can do. The content describes number concepts to 100, addition and subtraction, repeating and increasing patterns, symbolic and pictorial representations, linear measurement, attributes of 2D and 3D objects, financial literacy, and likelihood of familiar life events.

The AC: M and the BCC: M are comparable in their explicit requirements that students learn to count, recognise patterns, identify and describe shapes and objects, and represent information in pictorial and graphical forms. Both curricula recognise that any cohort of students is likely to have a wide range of ability and capacity to learn the defined content; this means dependence on the expertise of teachers and their ability to develop learning programs that incorporate a wide range of learning experiences to meet differing needs.

Measurement of Curriculum: Breadth, Depth and Rigour

	BREADTH			DEPTH			RIGOUR		
	Limited	Fundamental	Comprehensive	Limited	Fundamental	Challenging	Limited	Moderate	Challenging
AC									
BCC									

AC – Breadth

Breadth: Comprehensive

In terms of breadth of coverage, the expectations of the AC: M are considered to be **comprehensive**, covering a diverse number of topics indicative of the nature of this learning area. The concepts and skills of AC: M enable learners to build on the previous learning in Foundation and Year 1 as they develop their number and spatial skills and their ability to interpret data. There are 25 content descriptions across the three strands of Number and Algebra, Measurement and Geometry and Statistics and Probability. Under these strands, the content is further organised into threads:

Number and Algebra

- Number and place value (7 content descriptions),
- Fractions, and decimals (1 content description),
- Money and financial mathematics (1 content description)
- Patterns and algebra (2 content descriptions)

Measurement and Geometry

- Using units of measurement (5 content descriptions),
- Shape (2 content descriptions)
- Location and transformation (3 content descriptions)

Statistics and Probability

- Chance (1 content description)
- Data representation (3 content descriptions).

There are also 42 elaborations which, although not mandatory, offer teachers some insight into how the content can be presented to students. There are one or more elaborations aligned to each content description.

Table 3.6 *Number of content descriptions in AC: M, Year 2*

Year 2	Mathematics
Content descriptions	25
Elaborations	42
General Capabilities	5
Cross-Curriculum Priorities	3

BCC – Breadth

Breadth: Comprehensive

With regard to breadth, the BCC: M is rated as **comprehensive**; it contains five Big Ideas representing content for Number, Measurement and Data. The content and Curricular Competencies are evident under the Learning Standards. Elaborations are then linked to each content item to support these Big Ideas; these offer teaching ideas to explicate the content and provide resources for teachers. The detail of the content contained in the curriculum determines the variety of concepts to be taught in relation to Number, Measurement and Data.

Table 3.7 Number of statements in BCC: M, Grade 2

Grade 2	Mathematics
Big Ideas	5
Curricular Competencies	4
Elaborations	16
Content	12
Elaborations	35

AC – Depth

Depth: Challenging

The expectations of the AC: M in terms of depth are regarded as **challenging**. Within each of the strands of Number and Algebra, Measurement and Geometry and Statistics and Probability, the sub-strands determine further detail of the requirements for learning. The year-level descriptions for Year 2 reveal significant cognitive demand by referring to the Mathematics proficiencies contained in the content descriptions. For example, the Understanding proficiency includes building robust knowledge of adaptable and transferrable concepts, and in Year 2 this is evident in students making connections, partitioning and combining numbers and identifying and describing the relationships between the four number operations. Fluency includes choosing appropriate procedures, which can be carried out flexibly. At this year level, this implies counting numbers in sequences, using informal units iteratively to compare measurements, describing outcomes of familiar chance events making comparisons. Such statements define the range and nature of the expected actions in relation to the content descriptions. The depth of curriculum expectations at Year 2 is exemplified by the verbs used to describe the knowledge and skills contained within the content descriptions. These verbs range from *recognise*, *describe* and *identify* to higher-order expectations of *create*, *investigate* and *compare*.

BCC – Depth

Depth: Challenging

In relation to depth of learning, the expectations of the BCC: M at Grade 2 are deemed to be **challenging**. The knowledge and skills learned through the content points are necessary for students to understand and master the Curricular Competencies and Big Ideas, where there are opportunities for learning at a deeper level. Curricular Competencies described in the BCC: M set higher-order cognitive demands through phrases such as *explain and justify mathematical ideas and decisions*. The depth to which students engage with the content is highlighted by the elaborations connected to each content point. The connected elaborations present sample activities which require *comparison*, *collection* and *explanation*. The expectation from the content that students *connect mathematical concepts to each other and to other areas and personal interests* implies higher-order thinking. This expectation is supported by an elaboration asking that students *develop a sense of how mathematics helps us understand ourselves and the world around us (e.g., daily activities, local and traditional practices, the environment, popular media and news events, social justice, and cross-curricular integration)*. The design of the BCC: M encourages rich and deep learning but is

reliant on the ability of teachers to provide learning programs to provide the skills and understandings which are described in the Big Ideas.

AC – Rigour

Rigour: Challenging

The level of rigour in the AC: M is considered to be **challenging** as it places a considerable demand on students to engage in reasoning and problem-solving. Problem-solving requires students to make choices, investigate problem situations and communicate their thoughts. Reasoning develops the capacity for logical thought and actions such as explaining answers and the processes of solving problems. This is reflected in the year-level statement at the beginning of the curriculum which identifies how the problem solving and reasoning proficiencies are embedded in the curriculum to provide the level of rigour expected. In Year 2. The AC: M states that problem-solving includes *formulating problems from authentic situations, representing problems by modelling and matching, and reasoning includes using known facts to derive strategies for unfamiliar calculations, comparing and contrasting related models of operations and creating and interpreting simple representations of data*. These problem-solving and reasoning skills are contained in the achievement standard at Year 2, which describes what a typical student is expected to achieve by the end of Year 2. The achievement standard requires students to *interpret, explain and make inferences*, all of which require higher-order thinking skills and rigorous learning.

BCC – Rigour

Rigour: Challenging

The **challenging** nature of the BCC: M is promoted by the British Columbia Curricular Competencies which enable students to engage in abstract thinking and reasoning. For example, students are asked to *Develop and use multiple strategies to engage in problem-solving*. These competencies are further enhanced by the elaborations that describe some complex mathematical concepts, such as *sharing the mathematical thinking of self and others, including evaluating strategies and solutions, extending, and posing new problems and questions*. It is apparent that there is an expectation that students will engage in rigorous activities that require teachers to integrate the Big Ideas and the Curricular Competencies.

Comparative Analysis

Although the design of the two curricula is different, the expected mathematical learning in each curriculum is mostly the same. The AC: M organises the content under the three strands of Number and Algebra, Measurement and Geometry and Statistics and Probability. By contrast, the organisers in the BCC: M are based upon the Curricular Competencies of Reasoning and analysing, Understanding and solving, Communicating and representing, and Connecting and reflecting.

In the AC: M, the key ideas are the proficiency strands of Understanding, Fluency, Problem-solving and Reasoning. The proficiency strands describe the actions in which students can engage when learning and applying mathematical content. While not all proficiency strands apply to every content description, they indicate the breadth of mathematical actions that teachers can model. The elaborations are not mandatory but provide examples of context and exemplify the content. The AC: M also provides a Glossary linked to terms within the

curriculum content. These provide clear and concise definitions to enable teachers to clarify particular mathematical concepts.

The BCC: M consists of five Big Ideas, encompassing the four strands of Mathematics: number, patterns and relations, spatial sense, and statistics and probability. A focus on problem-solving is apparent in the Curricular Competencies, which include elaborations to assist teachers and students. Elaborations are not mandatory but include definitions of key Mathematics terminology, examples of Mathematics concepts, sample inquiry questions to support the exploration of concepts, and guidance on the level of depth suggested in the content.

First Peoples perspectives feature throughout the BCC: M Content learning standards and Elaborations. The AC: M has one reference to Aboriginal and Torres Strait Islander Histories and Cultures contained within one elaboration in the Year 2 Mathematics curriculum.

Content is described differently in the two curricula. The AC: M uses verbs to identify what a student should be able to do after their learning, while the BCC: M uses statements to describe what is to be taught. The depth and rigour of the BCC: M tends to be more obviously reliant on teacher practice and the ways in which the statements are incorporated into the Curricular Competencies. The following example shows the difference in the way the same content is represented:

AC: M *Create displays of data using lists, table and picture graphs and interpret them*

BCC: M *Create pictorial representation of concrete graphs, using one-to-one correspondence*

(Note: The Curricular Competency *Represent mathematical ideas in concrete, pictorial, and symbolic forms* could enhance the teaching of this concept.)

The AC: M contains content that is not found in the BCC: M for Year 2. Examples include:

- Recognise and represent multiplication as repeated addition, groups and arrays
- Recognise and represent division as grouping into equal sets and solve simple problems using these representations
- Recognise and interpret common uses of halves, quarters and eighths of shapes and collections
- Compare masses of objects using balance scales
- Tell time to the quarter-hour, using the language of 'past' and 'to'
- Name and order months and seasons
- Use a calendar to identify the date and determine the number of days in each month
- Interpret simple maps of familiar locations and identify the relative positions of key features
- Investigate the effect of one-step slides and flips with and without digital technologies
- Identify and describe half and quarter turns
- Identify a question of interest based on one categorical variable. Gather data relevant to the question.

Although this content may be covered in BCC: M by teachers in their practice, the content and concepts are not identified explicitly in the document. By contrast, the Curricular Competencies include *estimating by comparing to something familiar*, which does not include an explicit reference to a mathematical concept; rather, it allows for teachers to develop concepts in ways best suited to their students.

Additional Observations

The BCC: M directly references the First Peoples in the Curricular Competencies, in line with the intention to integrate learning in ways that expose all students to the study of Aboriginal Knowledge and Perspectives. In Mathematics, this includes the intention to “Incorporate First Peoples worldviews and perspectives to make connections to mathematical concepts” and to “Invite local First Peoples Elders and knowledge keepers to share their knowledge”. The AC: M references Aboriginal and Torres Strait Islander Histories and Cultures in one content elaboration.

Year/Grade Level

Australian Curriculum: Year 6

British Columbia Curriculum: Grade 6

Learning Area/Subject

Australian Curriculum: Mathematics (AC: M)

British Columbia Curriculum: Mathematics (BCC: M)

Expectations: Knowledge and Skills

The AC: M and the BCC: M have similar expectations with respect to knowledge and skills. The two curricula are comparable and explicit in requiring students to be able to manipulate whole numbers and fractions, and decimals and percentages. Both curricula introduce the concepts of patterning as a precursor to algebraic thinking. The AC: M specifically introduces the concepts of the Cartesian Plane to describe functions and graphs; BCC: M includes the idea of functions and graphs, although not in relation to the Cartesian Plane. Both curricula develop an understanding of shapes and objects and both ensure a focus on calculations of perimeter area and volume. The AC: M describes the calculation of probabilities and the interpretation of data, graphs and statistical reports in more detail than is seen in the BCC: M material.

The AC: M incorporates content across the three strands of Number and Algebra, Measurement and Geometry and Statistics and Probability. By the end of Year 6, students recognise the properties of prime, composite, square and triangular numbers. They describe the use of integers in everyday contexts and solve problems involving all four operations with whole numbers. Students connect fractions, decimals and percentages as different representations of the same number and solve problems involving the addition and subtraction of related fractions. Students make connections between the powers of 10 and the multiplication and division of decimals. They add, subtract and multiply and divide decimals where the result is rational and locate fractions and integers on a number line. They calculate a simple fraction of a quantity. Students calculate common percentage discounts on sale items. They write correct number sentences using brackets and order of operations. They describe rules used in sequences involving whole numbers, fractions and decimals. Students locate an ordered pair in any one of the four quadrants on the Cartesian plane. Students connect decimal representations to the metric system and choose appropriate units of measurement to perform a calculation. They construct simple prisms and pyramids and make connections between capacity and volume. They solve problems involving length and area. They interpret timetables. Students describe combinations of transformations. They solve problems using the properties of angles. Students compare observed and expected frequencies and interpret and compare a variety of data displays, including those displays for two categorical variables. They interpret secondary data

displayed in the media and describe probabilities using simple fractions, decimals and percentages.

The Mathematics proficiencies underpin the ways in which the content in the AC: M is to be taught, expanding on the actions required of students as they engage with the mathematical content. At Year 6, the proficiency expectations are as follows:

- **understanding** includes describing properties of different sets of numbers, using fractions and decimals to describe probabilities, representing fractions and decimals in various ways and describing connections between them, and making reasonable estimations
- **fluency** includes representing integers on a number line, calculating simple percentages, using brackets appropriately, converting between fractions and decimals, using operations with fractions, decimals and percentages, measuring using metric units and interpreting timetables
- **problem-solving** includes formulating and solving authentic problems using fractions, decimals, percentages and measurements, interpreting secondary data displays and finding the size of unknown angles
- **reasoning** includes explaining mental strategies for performing calculations, describing results for continuing number sequences, explaining the transformation of one shape into another and explaining why the actual results of chance experiments may differ from expected results.

The BCC: M contains five Big Ideas representing content contained in Number, Measurement, and Data. There is evidence of the development of the concept of mixed numbers and decimal numbers which represent quantities that can be separated into parts and wholes. Grade 6 students develop computational fluency and flexibility with numbers which extend to operations with whole numbers and decimals. They become familiar with linear relations which can be identified and represented using expressions with variables and line graphs and can be used to form generalisations. Students describe the properties of objects and shapes, and measure and compare them using volume, area, perimeter and angles. Grade 6 students compare and interpret data from the results of an experiment which can be used to predict the theoretical probability of an event. There is evidence of the development of reasoning and analysing, understanding, and solving, communicating, and representing and connecting and reflecting are expanded to identify what students can do. The expanded content describes small to large numbers, multiplication and division facts to 100, order of operations with whole numbers, factors and multiples, improper fractions, ratios, whole number percentages and discounts, multiplication and division of decimals, increasing and decreasing patterns, using expressions, tables and graphs, finding perimeter and area of different shapes, classifying angles and triangles, combinations of transformations, volume and capacity, financial literacy and single outcome probability.

Measurement of Curriculum: Breadth, Depth and Rigour

	BREADTH			DEPTH			RIGOUR		
	Limited	Fundamental	Comprehensive	Limited	Fundamental	Challenging	Limited	Moderate	Challenging
AC									
BCC									

AC – Breadth

Breadth: Comprehensive

With regard to topic coverage, the expectations of the AC: M are **comprehensive**. They incorporate 25 content descriptions across the three strands of Number and Algebra, Measurement and Geometry and Statistics and Probability, and under these strands, the content is further organised into threads:

Number and Algebra

- Number and place value (3 content descriptions)
- Fractions, and decimals (7 content description)
- Money and financial mathematics (1 content description)
- Patterns and algebra (2 content descriptions)

Measurement and Geometry

- Using units of measurement (5 content descriptions)
- Shape (1 content description)
- Location and transformation (2 content descriptions)
- Geometric reasoning (1 content description)

Statistics and Probability

- Chance (3 content descriptions)
- Data representation (2 content descriptions).

Elaborations, although not mandatory in the AC: M, provide additional information for teachers, links to the General Capabilities and Cross-Curriculum Priorities and further clarification of the content description. There is always at least one elaboration linked to each content description in Year 6.

The content contained in Year 6 builds on the content addressed in Foundation through to Year 5 under the three content strands. The sequential nature of the AC: M means that concepts are developed each year and become more sophisticated as students progress through the years of schooling.

Table 3.8 *Number of content descriptions in AC: M, Year 6*

Year 6	Mathematics
Content descriptions	27
Elaborations	46
General Capabilities	5
Cross-Curriculum Priorities	3

BCC – Breadth

Breadth: Fundamental

The breadth of the BCC: M at Year 6 is deemed to be **fundamental**. The BCC: M contains five Big Ideas representing content contained in Number, Measurement and Data. The curriculum recognises the need for students to have a wide scope of learning and content but the breadth of content is at times dependent on interpretation by teachers and is not necessarily specific about which concepts are to be mastered. The content and elaborations

describe simple concepts and do not point to more complex conceptual understanding. An example of the lack of specific direction is found in the content point which describes the concept of percentages as whole-number percents but does not make the connection of percentages to decimals and fractions. Similarly, there is a content point referring to angles which refers only to very simple angles, leaving out more sophisticated concepts relating to angles formed by transversals crossing parallel lines or the measurement of angles with instruments.

Table 3.9 Number of statements in BCC: M, Grade 6

Grade 6	Mathematics
Big Ideas	5
Curricular Competencies	4
Elaborations	18
Content	19
Elaborations	54

AC – Depth

Depth: Challenging

In relation to depth in Year 6, the AC: M is regarded as **challenging**. Within each of the strands of Number and Algebra, Measurement and Geometry and Statistics and Probability, the sub-strands provide further detail. The year-level descriptions at the beginning of the Year 6 AC: Mathematics show a range of cognitive demand, with the focus on the Understanding and Fluency proficiencies reflecting the expected depth of learning. Understanding includes building robust knowledge of adaptable and transferrable concepts and in Year 6 this is evident in students describing connections and making reasonable estimations. Fluency involves choosing appropriate procedures which can be carried out flexibly, and at this year level implies students being able to represent, convert and interpret mathematical concepts. After being taught the content, students should be able to describe connections between concepts they have learnt and to represent their knowledge in various ways. The verbs used to describe the knowledge and skills contained within the content descriptions range from *select* and *describe* to higher-order verbs of *create*, *interpret* and *compare*. Such learning requires considerable in-depth exploration of concepts and justifies the classification of ‘challenging’.

BCC – Depth

Depth: Challenging

With respect to the depth of coverage of knowledge and skills, the expectations of the BCC: M at Grade 6 are deemed to be **challenging**. Mathematical concepts are introduced as the Big Ideas and these are supported by a list of Content Topics specifying the aspects of the mathematical concepts that are intended to be the focus of teaching and learning. Curricular Competencies described in the BCC: M identify higher-order cognitive demand through phrases such as *explain and justify mathematical ideas and decisions*, *making connections*, *using inductive and deductive reasoning*, *predicting*, *generalising*, and *drawing conclusions through experiences*. Similarly, a competency such as *sharing the mathematical thinking of*

self and others, including evaluating strategies and solutions, extending, and posing new problems and questions implies deep thinking. On the basis of such consistently high expectations, the BCC: M at Grade 6 is assessed as **challenging** in relation to depth of learning for this cohort.

AC – Rigour

Rigour: Challenging

The rigour of the AC: M is deemed to be **challenging**, placing considerable demand on students to engage in reasoning and problem solving. The year-level statement for Year 6 specifies that problem-solving includes formulating and solving authentic problems, interpreting secondary data displays and finding unknown angles. The level of rigour is further exemplified by the emphasis on reasoning, which includes explaining mental strategies for performing calculations, describing results for continuing number sequences, explaining transformations and demonstrating why the results of chance experiments may differ from expected results. The content descriptions at Year 6 require higher-order thinking skills. This is evident in the language used to describe the content description. For example, students are required to *interpret and compare a range of data displays, including side-by-side column graphs for two categorical variables* and to *Interpret secondary data presented in digital media and elsewhere*. These are demanding skills for typical Year 6 students. The content descriptions expect students to be able to do more than procedural calculations and computations, as seen in verbs that refer to higher-order thinking. Verbs such as *investigate and calculate, continue and create, explore the use of, interpret and use, and investigate combinations*, make it clear that the learning is to be challenging and investigative.

The achievement standard defines the expectation of what a typical student is able to achieve by the end of Year 6. Students are expected to be able to *solve problems involving all four operations, connect fractions, decimals and percentages, make connections between capacity and volume, and interpret secondary data in the media*. These expectations imply higher-order mathematical thinking, which supports the classification of ‘challenging’.

BCC – Rigour

Rigour: Challenging

The level of rigour in the BCC: M at Grade 6 is deemed to be **challenging**. The rigour of the curriculum is promoted by the BC Curricular Competencies which enable students to engage in some abstract thinking and reasoning, such as *Use reasoning and logic to explore, analyse, and apply mathematical ideas*. These competencies are enhanced by the elaborations which describe some complex mathematical concepts, of which one example is *sharing the mathematical thinking of self and others, including evaluating strategies and solutions, extending, and posing new problems and questions*.

The content for Grade 6 includes higher-order concepts and expectations. Deep thinking is required to meet expectations such as *using graphic organisers (e.g., Venn diagrams) to compare numbers for common factors and common multiples*. However, there are also some lower-order content statements such as *using base 10 blocks, geoboard, 10x10 grid to represent whole number percents*; this is content that is covered in earlier year levels.

Comparative Analysis

There are differences in structure, content and expectations between the AC: M and the BCC: M. The AC: M organises the content under the three strands of Number and Algebra, Measurement and Geometry, and Statistics and Probability. By contrast, the organisers in the BCC: M centre on the Curricular Competencies of Reasoning and analysing, Understanding and solving, Communicating and representing and Connecting and reflecting. In the AC: M, the key ideas are the proficiency strands of understanding, fluency, problem-solving and reasoning. The proficiency strands describe the actions in which students can engage when learning and using the content. While not all proficiency strands apply to every content description, they indicate the breadth of mathematical actions that teachers can select for focus in the classroom.

The BCC: M consists of five Big Ideas, encompassing the four strands of Mathematics: number, patterns and relations, spatial sense, and statistics and probability. There is a focus on problem-solving apparent in the Curricular Competencies, which include elaborations to assist teachers and students. Elaborations are not mandatory but include definitions of key mathematical terminology, examples of mathematical concepts, sample inquiry questions to support the exploration of concepts, and guidance on the level of depth suggested in the content.

First Peoples perspectives are reflected in the British Columbia Content learning standards and Elaborations. The AC: M has one reference to Aboriginal and Torres Strait Islander Histories and Cultures contained within one elaboration.

The description of content in each curriculum is significantly different. Sentences in the AC: M begins with a verb to outline what a student should be able to do as a result of learning the material; the BCC: M uses statements to describe what is to be taught. The depth and rigour of the BCC: M is reliant on teacher practice and the ways in which these statements are incorporated into the Curricular Competencies. The example below demonstrates the difference in the way the content is presented in each curriculum.

AC: M Add and subtract decimals, with and without digital technologies, and use estimation and rounding to check the reasonableness of answers

BCC: M Computational fluency and flexibility with numbers extend to operations with whole numbers and decimals

Differences in content are evident. The AC: M contains content that is not evident in the BCC: M, as shown below:

- select and apply efficient mental and written strategies and appropriate digital technologies to solve problems involving all four operations with whole numbers
- investigate everyday situations that use integers. Locate and represent these numbers on a number line
- solve problems involving addition and subtraction of fractions with the same or related denominators
- find a simple fraction of a quantity where the result is a whole number, with and without digital technologies
- make connections between equivalent fractions, decimals and percentages
- explore the use of brackets and order of operations to write number sentences
- convert between common metric units of length, mass and capacity

- solve problems involving the comparison of lengths and areas using appropriate units
- interpret and use timetables
- introduce the Cartesian coordinate system using all four quadrants
- conduct chance experiments with both small and large numbers of trials using appropriate digital technologies
- interpret and compare a range of data displays, including side-by-side column graphs for two categorical variables
- interpret secondary data presented in digital media and elsewhere.

The BCC: M contains elaborations that can be incorporated into many aspects of a teaching program. Examples are provided below:

- making connections, using inductive and deductive reasoning, predicting, generalising, drawing conclusions through experiences
- estimating using referents, approximation, and rounding strategies (e.g., the distance to the stop sign is approximately 1 km, the width of my finger is about 1 cm)
- extending whole-number strategies to decimals
- comparing numbers, comparing quantities, equivalent ratios
- mental math strategies (e.g., the double-double strategy to multiply 23×4)
- patterning: we use patterns to represent identified regularities and to make generalisations
- acting it out, using concrete materials (e.g., manipulatives), drawing pictures or diagrams, building, programming
- acting it out, using concrete materials (e.g., manipulatives), drawing pictures or diagrams, building, programming
- to develop a sense of how mathematics helps us understand ourselves and the world around us (e.g., cross-discipline, daily activities, local and traditional practices, the environment, popular media and news events, and social justice).

These elaborations are general and do not apply to specific content. The use of the first person (*my finger, helps us to understand*) is a feature of the BCC and reflects a clear effort to personalise the learning process in Mathematics. As is demonstrated in other learning areas, the curriculum's emphasis on personalised learning in Mathematics means that students' individual needs and interests may be addressed alongside their development of a sense of responsibility for their own learning.

Additional Observations

The proficiencies provide guidance for teachers about how to teach the mathematical content in Year 6. The BCC: M does not include such prescriptive statements in their curriculum and appears to rely strongly on the teacher to select and teach the content.

The BCC: M directly references the First Peoples in Curricular Competencies, including the intention to "Incorporate First People worldviews and perspectives to make connections to mathematical concepts". Another strategy is to "Invite local First Peoples Elders and knowledge keepers to share their knowledge". The AC: M references Aboriginal and Torres Strait Islander Histories and Cultures through one elaboration: "investigating the use of rotation and symmetry in the diagrammatic representations of kinship relationships of Central and Western Desert people".

Year/Grade Level

Australian Curriculum: Year 10

British Columbia Curriculum: Grade 10 ⁷

Learning Area/Subject

Australian Curriculum: Mathematics (AC: M)

British Columbia Curriculum: Mathematics (BCC: M)

Expectations: Knowledge and Skills

At Year 10, there is a significant difference between the AC: M and the draft BCC: M.⁸ Australian students finish their compulsory years of schooling at Year 10 but British Columbia students complete their compulsory years of schooling at Year 9. Thus, at the Year 10 level, they have made their subject selection for their senior years of study. Both curricula retain their structure but are quite different in their purpose at this stage of schooling. The AC: M maintains its strand-based structure for all Year 10 students but also provides an optional and more challenging set of content descriptions for students planning to take on a calculus-based subject in the senior secondary years (Years 11 and 12). British Columbia offers two pathways for Year 10 students, known as *Foundations of Mathematics and Pre-Calculus* and *Workplace Mathematics*.

The AC: M incorporates content across the three strands of Number and Algebra, Measurement and Geometry and Statistics and Probability. By the end of Year 10, students recognise the connection between simple and compound interest. They solve problems involving linear equations and inequalities and make the connections between algebraic and graphical representations of relations. Students expand binomial expressions and factorise monic quadratic expressions. They find unknown values after substitution into formulas and perform the four operations with simple algebraic fractions. Students solve simple quadratic equations and pairs of simultaneous equations. Students solve surface area and volume problems relating to composite solids and recognise the relationships between parallel and perpendicular lines. Students apply deductive reasoning to proofs and numerical exercises involving plane shapes. They use triangle and angle properties to prove congruence and similarity and use trigonometry to calculate unknown angles in right-angled triangles. Students list outcomes for multi-step chance experiments and assign probabilities for these experiments. They calculate quartiles and inter-quartile ranges and compare data sets by referring to the shapes of the various data displays. They describe bivariate data where the independent variable is time. Students describe statistical relationship between two continuous variables and evaluate statistical reports.

At Grade 10, the BCC: M has two options for students ⁷:

1. Foundations of Mathematics and Pre-Calculus

⁷ The draft BCC: Mathematics Grade 10-12 was in preliminary form at the time this comparative study was undertaken. Findings for breadth, depth and rigour have not been included for BCC: Mathematics Grade 10.

⁸ At the time of research for this paper, the British Columbia authorities were reviewing feedback on the draft 10-12 curricula for Mathematics, the intention being that all BC school would implement the new Grade 10 curriculum in 2018-2019 and the new Grades 11-12 curriculum in 2019-2020.

2. Workplace Mathematics.

The draft BCC: M contains five Big Ideas representing content contained in Number, Measurement and Data. These are:

- proportional comparisons can be made among right triangles, using trigonometry
- the meaning of each operation, including powers, extends to algebraic expressions.
- rate of change is an essential attribute of linear relations, and has meaning in the different representations, including equations
- operations between polynomial expressions are connected and allow us to make meaning through abstract thinking
- analysing simulations and data allows us to notice trends and relationships.

Curricular Competencies for Grade 10 support the Big Ideas and include *Reasoning and analysing*, *Understanding and solving*, *Communicating and representing* and *Connecting and reflecting*. Underpinning each of these Curricular Competencies are statements to assist in the learning of Mathematics at Grade 10. For example, under *Communicating and representing* students will find the expectation that they *explain and justify mathematical ideas*. The content for the Foundations of Mathematics and Pre-Calculus is provided in statements, with students expected to master the following:

- operations on powers with integral exponents
- relationships among data, graphs, and situations
- linear relations, including slope and equations of lines
- solving systems of linear equations
- multiplication of polynomial expressions
- polynomial factoring
- primary trigonometric ratios
- experimental probability
- financial literacy: gross and net pay.

There are elaborations to support the Big Ideas, provided in short statements. There are also elaborations for the Curricular Competencies which are more like a glossary than teaching ideas such as *Estimate*: • *being able to defend the reasonableness of an estimate across mathematical contexts*.

Five Big Ideas underpin the Workplace Mathematics curriculum; these are similar to the five Big Ideas of the Foundations of Mathematics and Pre-Calculus curriculum, as follows:

- proportional comparisons can be made among right triangles using trigonometry
- understanding operations helps when working with formulae and unit conversions
- many relationships can be modelled and interpreted using graphs
- varying the transversal allows us to notice angle relationships
- analysing simulations and data allows us to notice trends and relationships.

These five Big Ideas are supported by the Curricular Competencies identified for Grade 10, which are *Reasoning and analysing*, *Understanding and solving*, *Communicating and representing* and *Connecting and reflecting*. Each of these Curricular Competencies is supported by statements that assist in the learning of Mathematics at Grade 10. An example, under *Communicating and representing*, is *explain and justify mathematical ideas*. These

Curricular Competencies are the same as for the Foundations of Mathematics and Pre-Calculus curriculum.

The content for the Workplace Mathematics is also written as statements, with students expected to become competent in the following:

- puzzles and games for computational fluency
- create, interpret, and critique graphs
- primary trigonometric ratios
- metric and imperial measurement and conversions
- solving problems involving surface area and volume
- angles
- central tendency
- experimental probability
- financial literacy: gross and net pay.

In the main, the AC: M is explicit and detailed in its expectations of what students should learn. The BCC: M is in draft form and a comparison will not be made in this study. As the AC is written for teachers, it is not surprising that classroom practitioners are given a very clear picture of what students are required to learn in Year 10. Given that the BCC Grade 10 Mathematics is in draft form, this study cannot determine the extent to which teachers need to make decisions regarding the breadth and depth of learning for Grade 10 Mathematics.⁹

More able students in Australia can enrol in the 10A Mathematics curriculum which provides some more challenging content to prepare students for the senior secondary Mathematics subjects.

Measurement of Curriculum: Breadth, Depth and Rigour

	BREADTH			DEPTH			RIGOUR		
	Limited	Fundamental	Comprehensive	Limited	Fundamental	Challenging	Limited	Moderate	Challenging
AC									
BCC	Not rated			Not rated			Not rated		

AC – Breadth

Breadth: Comprehensive

For Year 10 students, the expectations of the AC: M are assessed as **comprehensive**. They incorporate 25 content descriptions across the three strands of Number and Algebra, Measurement and Geometry and Statistics and Probability.

Under those strands, the content is further organised into threads:

⁹ The draft BCC: Mathematics Grade 10-12 was in preliminary form at the time this comparative study was undertaken. Findings for breadth, depth and rigour have not been included for BCC: Mathematics Grade 10.

Year 10

Number and Algebra

- Money and financial mathematics (1 content description)
- Patterns and algebra (5 content descriptions)
- Linear and non-linear relationships (7 content descriptions)

Measurement and Geometry

- Using units of measurement (1 content description)
- Geometric reasoning (2 content descriptions)
- Pythagoras and trigonometry (1 content description)

Statistics and Probability

- Chance (2 content descriptions)
- Data representation (6 content descriptions).

The 10A section of the AC: M provides content for more able students to prepare them for the calculus-based courses in Years 11 and 12. This section also extends students who have a particular interest in this learning area.

Mathematics 10A

Number and Algebra

- Real numbers (2 content descriptions)
- Patterns and algebra (1 content description)
- Linear and non-linear relationships (4 content descriptions)

Measurement and Geometry

- Using units of measurement (1 content description)
- Geometric reasoning (1 content description)
- Pythagoras and trigonometry (4 content descriptions)

Statistics and Probability

- Chance (1 content description)
- Data representation (2 content descriptions).

Table 3.10 *Number of content descriptions in AC: M, Year 10*

Year 10	Mathematics	10A
Content descriptions	25	16
Elaborations	39	26
General Capabilities	4	6
Cross-Curriculum Priorities	3	0

BCC – Breadth

Breadth: Not rated ¹⁰

Based on the available documentation for the draft BCC: M, the breadth of the learning in the Grade 10 BCC: M for Foundations of Mathematics and Pre-Calculus and the Workplace Mathematics subjects is not rated. The amount of content and the topic coverage in both the

¹⁰ The draft BCC: Mathematics Grade 10-12 was in preliminary form at the time this comparative study was undertaken. Findings for breadth, depth and rigour have not been included for BCC: Mathematics Grade 10.

Foundations of Mathematics and Pre-Calculus and the Workplace Mathematics subjects are not rated.¹¹

AC – Depth

Depth: Challenging

The depth of learning expected in the AC: M for Year 10 students is deemed to be **challenging**. The fluency and understanding concepts contain in the proficiencies embedded into the content require students to engage with the mathematical concepts and ideas at a high level. Understanding requires students to have the confidence to use the familiar to develop new ideas, and fluency implies carrying out procedures flexibly, accurately and recalling factual knowledge and concepts readily. The year-level descriptions at the beginning of the Year 10 AC: M demonstrate a range of cognitive demand. They include *using algebraic and graphical techniques to find solutions to simultaneous equations and inequalities* and *formulating geometric proofs involving congruence and similarity*. The verbs used to describe the knowledge and skills contained within the content descriptions range from *select* and *describe* to such higher-order verbs as *connect*, *interpret* and *compare*, indicating the progression of student learning.

The depth of content in the 10A course is significantly more demanding than that expected of other students. The content extends the Year 10 material to develop deeper understanding of concepts and the verbs used in these content descriptions focus on describing and explaining concepts as well as on solving complex problems.

BCC – Depth

Depth: Not rated¹¹

With regard to depth, the draft BCC: M Foundations of Mathematics and Pre-Calculus and the Workplace Mathematics are not rated.¹¹ Competencies described in the BCC: M are similar to those in earlier years but do make some higher-order cognitive demands. There are opportunities for students to undertake deep thinking about the relevance and application of mathematics in the Pre- Calculus course.

AC – Rigour

Rigour: Challenging

The rigour of the AC: M is considered to be **challenging** as it places considerable demand on students to engage in reasoning and problem-solving, including the ability to interpret, formulate, model and investigate problems. Reasoning requires logical thought and actions such as proving, explaining, inferring, justifying and generalising. The year-level statement for Year 10 describes how both problem-solving and reasoning are evident:

- **Problem solving** includes calculating the surface area and volume of a diverse range of prisms to solve practical problems, finding unknown lengths and angles using applications of trigonometry, using algebraic and graphical techniques to find solutions to simultaneous equations and inequalities and investigating independence of events

¹¹ The draft BCC: Mathematics Grade 10-12 was in preliminary form at the time this comparative study was undertaken. Findings for breadth, depth and rigour have not been included for BCC: Mathematics Grade 10.

- **Reasoning** includes formulating geometric proofs involving congruence and similarity, interpreting and evaluating media statements and interpreting and comparing data sets.

The intention of the AC: M is for teachers to teach the content through the proficiencies, with a particular emphasis on problem-solving and reasoning. To this end, the AC: M provides the opportunity for students to be challenged and to encounter problems that are unfamiliar. This is inherently reliant on teacher practice and pedagogy.

The content descriptions at Year 10A require higher-order thinking skills. In Year 10, under Pythagoras and trigonometry, students are expected to *Solve right-angled triangle problems including those involving direction and angles of elevation and depression (ACMMG245)* but in the 10A content students *Apply Pythagoras' Theorem and trigonometry to solving three-dimensional problems in right-angled triangles (ACMMG276)*. These are demanding and students must develop sophisticated thinking skills to be able to work through problems related to this content.

BCC – Rigour

Rigour: Not rated¹²

It is not possible to make a definitive judgement regarding the rigour of BCC: M Foundations of Mathematics and Pre-Calculus and Workplace Mathematics. The content standards and the elaborations of the BCC: M are clear, and the nature of the curriculum is evident in relation to the BC Curricular Competencies. In these courses, the competencies are similar, but the elaborations of these competencies cannot be fully examined as the draft form of the Mathematics curriculum is under development.¹²

Comparative Analysis¹²

There are significant differences between the AC: M and the BCC: M at the Year 10 level. The intent of the AC: M is to provide students with the opportunity to engage with the challenging and abstract nature of mathematics and, for those students who study the 10A course, with highly abstract concepts. Greater choice is available to Year 10 students in the BCC as students can pursue either Pre-Calculus Mathematics or Workplace Mathematics. The level of challenge in BCC: M cannot be determined as the Mathematics curriculum is in draft form.

The AC: M organises the content under the three strands of Number and Algebra, Measurement and Geometry and Statistics and Probability. By contrast, the organisers in the BCC: M are around the Curricular Competencies of *Reasoning and analysing, Understanding, and solving, Communicating and representing and Connecting and reflecting*. In the AC: M, the key ideas are the proficiency strands of understanding, fluency, problem-solving and reasoning. The proficiency strands describe the actions in which students can engage when learning and using the content. While not all proficiency strands apply to every content description, they indicate the breadth of mathematical actions that teachers could address.

¹² The draft BCC: Mathematics Grade 10-12 was in preliminary form at the time this comparative study was undertaken. Findings for breadth, depth and rigour have not been included for BCC: Mathematics Grade 10.

The BCC: M consists of five Big Ideas, encompassing the four strands of Mathematics: *number, patterns and relations, spatial sense, and statistics and probability*. A focus on problem-solving is apparent in the Curricular Competencies, which include elaborations to assist teachers and students. Elaborations are not mandatory, but they include definitions of key mathematical terminology, examples of mathematical concepts, sample inquiry questions to support the exploration of concepts, and guidance on the level of depth suggested in the content.

Content is described differently in the two curricula. The AC: M's descriptions begin with a verb to emphasise the learning that is determined to be appropriate for a typical Year 10 student. The draft BCC: M describes what is to be taught, expressed as a statement or phrase. The differences in content and concepts seen across the AC: M and BCC: M courses are difficult to determine due to the draft form of the BC Grade 10 Mathematics curriculum.¹³

Additional Observations

The use of the first person is a key feature of the design of the draft BCC: M. Such language reminds students of their role in the learning process and encourages them to take responsibility for their own learning.

The BCC: M directly references the First Peoples in the Curricular Competencies in all grades. For Year 10 students, the AC: M references the Cross-Curriculum Priority of Aboriginal and Torres Strait Islander Histories and Cultures through two elaborations: *using parallel box plots to compare data about the age distribution of Aboriginal and Torres Strait Islander people with that of the Australian population as a whole* and *evaluating statistical reports comparing the life expectancy of Aboriginal and Torres Strait Islander people with that of the Australian population as a whole*.

¹³ The draft BCC: Mathematics Grade 10-12 was in preliminary form at the time this comparative study was undertaken. Findings for breadth, depth and rigour have not been included for BCC: Mathematics Grade 10.

c) Science

Comparative Curricula

Australian Curriculum: Science

British Columbia Curriculum: Science

Year/Grade Level

Australian Curriculum: Year 2

British Columbia Curriculum: Grade 2

Learning Area/Subject

Australian Curriculum: Science (AC: S)

British Columbia Curriculum: Science (BCC: S)

Expectations: Knowledge and Skills

The AC: S addresses conceptual, procedural and epistemic knowledge of the natural sciences in the form of three interrelated strands referred to as *Science understanding* (SU), *Science inquiry skills* (SIS) and *Science as a human endeavour* (SHE). The SHE strand includes knowledge about the impact of science on society. Attitudes and dispositions towards science are not specifically addressed in the year-level description of the curriculum. At Year 2 level, the AC: S expects students to describe changes to objects, materials and living things, to identify that certain materials and resources have different uses and to describe examples of where science is used in people's daily lives. With respect to Science inquiry skills, students are expected to pose and respond to questions about their experiences and to predict outcomes of investigations, to use informal measurements to make and compare observations, to record and represent observations, and to communicate ideas in a variety of ways.

The BCC: S addresses conceptual knowledge in the form of *Big Ideas* supported by a list of *Content Topics*. Procedural knowledge, attitudes and dispositions are addressed in the form of *Curricular Competencies*. While epistemic knowledge is not addressed specifically, some Curricular Competencies relate to the impact of science on society. At the end of Grade 2, the BCC: S expects students to know examples of metamorphic and non-metamorphic life cycles of different organisms and how First Peoples make use of their knowledge about those cycles, identify similarities and differences between offspring and parent, understand the difference between physical and chemical ways of changing materials, know different types of forces and their impact on moving objects, and understand the water cycle and the notion of water as a limited resource, including First Peoples knowledge and perspectives regarding the importance of water conservation. In relation to Curricular Competencies, students are expected to be able to observe, ask questions, make simple predictions about familiar objects and events, sort, classify and identify simple patterns and connections in data and information using drawings, pictographs and provided tables, compare observations with predictions and communicate ideas using oral or written language, drawing or role-play.

The AC: S and the BCC: S are comparable and explicit in requiring Year 2 / Grade 2 students to acquire conceptual knowledge of one fundamental concept from each of the four disciplines of Biology, Chemistry, Physics and Earth and Space Science, as well as to develop skills related to scientific inquiry, such as questioning and predicting, planning and

conducting, processing and analysing data and information, evaluating and communicating. The AC: S is distinctive in that it explicitly addresses knowledge about the nature of science as well as its purpose, use in and impact on society. The BCC: S does not focus on this aspect of science, but it emphasises First Peoples knowledge and perspectives of science and the importance of *place* in human perception and experience of the world. In British Columbia, the curriculum includes attitudes and dispositions towards science in its Curricular Competencies and adds competencies relating to *Applying and Innovating* to the list of traditional Science inquiry skills mentioned above. There is also a distinct difference between the two curricula in the way elaborations are used to support the primary content descriptions in both curricula. While AC: S elaborations are written in the form of suggestions for possible learning activities, which implies an optional rather than mandatory intention, elaborations of the content topics in the BCC: S are used in the form of explanatory and exemplifying statements. Elaborations for the Big Ideas are provided in the form of sample questions intended to support an inquiry approach to teaching the topic.

Measurement of Curriculum: Breadth, Depth and Rigour

	BREADTH			DEPTH			RIGOUR		
	Limited	Fundamental	Comprehensive	Limited	Fundamental	Challenging	Limited	Moderate	Challenging
AC									
BCC									

AC – Breadth

Breadth: Comprehensive

For students in Year 2, the expectations of the AC: S are **comprehensive** with respect to breadth of coverage. The content descriptors address four topics in the Science Understanding (SU) strand, relating to a fundamental concept from each of the four disciplines of Biology, Chemistry, Earth and Space Science and Physics, and six SIS and two concepts relating to SHE. Each of the content descriptions in the SU and SHE strand is supported by several elaborations that provide additional detail. The topics in the SU strand are defined broadly enough to allow for sustained and rich learning opportunities and the SIS content comprehensively addresses the skills required to explore the topics through an inquiry approach. Combined with the SHE content, which addresses the nature, purpose and use of science, the overall breadth of the Year 2 content is considered comprehensive.

Table 3.11 *Number of content descriptions and elaborations in AC: S, Year 2*

AC: Science (Year 2) Strands	Content Descriptions	Elaborations
Science understanding (SU)	4	16
Science inquiry skills (SIS)	6	12
Science as a human endeavour (SHE)	2	8
Total:	12	36

BCC – Breadth

Breadth: Comprehensive

For students in Grade 2, the expectations of the BCC: S are **comprehensive** with respect to breadth of coverage. The curriculum addresses four Big Ideas representing four fundamental concepts from the disciplines of Biology, Chemistry, Earth and Space Science, and Physics. Its content section lists ten topics and three subtopics that clarify the intended focus of student investigation with respect to those Big Ideas. The Curricular Competencies section lists 19 skills, activities and dispositions that not only comprehensively address the skills required to explore the content topics through an inquiry approach, but also include skills and activities under the rubric *Applying and Innovating* that go beyond the set of skills traditionally attributed to scientific inquiry (e.g. *Take part in caring for self, family, classroom and school through personal approaches, or Generate and introduce new or refined ideas when problem-solving*). All three sections of the curriculum (Big Ideas, Content Topics, and Curricular Competencies) are supported by elaborations that provide key questions and/or explanatory examples; together, these indicate numerous opportunities for sustained and rich learning experiences.

Table 3.12 Number of content descriptions and elaborations in BCC: S, Grade 2

BCC: Science (Grade 2) Curriculum Elements	Content Descriptions	Elaborations
Big ideas	4	10
Content Topics	10*	15*
Curricular Competencies	19	8*
Total:	33	33

* Only top-level bullet-points and major paragraphs were counted as constituting a single content description or elaboration.

AC – Depth

Depth: Fundamental

In relation to the depth of coverage of knowledge and skills specified in the curriculum, the expectations of the AC: S Year 2 are deemed to be **fundamental**. The content descriptions of the SU strand are written as propositions, expressed as broad and general statements; these leave room for interpretation as to which specific aspects of the scientific concept underlying the proposition could be the focus of teaching and learning. For example, ACSSU031 states *Different materials can be combined for a particular purpose*. This statement allows for the exploration of multiple concepts such as the classification of materials according to properties or how properties affect uses. The word *combined* indicates that the focus could also be on introducing the idea of chemical reactions. The depth to which the concept is intended to be explored is left to the teacher to determine. While the content descriptions of the SIS and SHE strands contain detail that indicates a higher level of depth, the overall expectations of the AC: S Year 2 are considered **fundamental**.

BCC – Depth

Depth: Challenging

With respect to depth of coverage of knowledge and skills, the expectations of the BCC: S Grade 2 are deemed to be **challenging**. Scientific concepts are introduced in the form of propositions, referred to as Big Ideas, and supported by a list of Content Topics that specify the aspects of the concept that are intended to be the focus of teaching and learning. Combined with the elaborations in the form of key inquiry questions and explanations and examples for the scientific terms used, the information provided by the BCC: S provides adequate detail to gauge the depth to which each concept is to be explored. For example, the Big Idea *Living things have life cycles adapted to their environment* is accompanied by the topics *metamorphic and non-metamorphic life cycles of different organisms* and *similarities and differences between offspring and parent* which in turn are supported by elaborations that explain the scientific terms used and provide examples of their meanings.

In addition, the following key questions are provided, intended to support inquiry skills: *Why are life cycles important? How are the life cycles of local plants and animals similar and different? How do offspring compare to their parents?* To answer any of these *how* and *why* questions requires considerable in-depth exploration of the concept. Thus, the expected depth of the scientific inquiry, which is also indicated by the terms *metamorphic vs non-metamorphic* and the accompanying examples given in the elaborations, justifies the classification of **challenging**.

AC – Rigour

Rigour: Moderate

The terminology and expectations of the AC: S indicate a **moderate** degree of rigour for Year 2 students. In the AC: S, content descriptions in the SU and SHE strands are written in the form of propositions and do not provide specific information about the cognitive demand placed on students. While the achievement standards give an indication of what students are expected to do, the succinct way in which they are written limits the information available for judging expectations with respect to rigour without including the elaborations. For example, the elaborations for the SU and SHE content descriptions, together with the Year 2 achievement standard, provide further indication of the material that students are expected to *observe, describe, identify* and *recognise*. Combined with the SIS descriptions, which provide more information about cognitive demand, it is clear that the AC: S provides numerous opportunities for students to gain knowledge of the prescribed scientific concepts through comparing, identifying, classifying, describing, and explaining phenomena. There are some instances of content elaborations that involve deductive as well as inductive inference, such as *suggesting why different parts of everyday objects such as toys and clothes are made from different materials*. However, the content descriptions and elaborations do not reveal a level of abstract thinking or critical analysis and evaluation that would justify the classification **challenging**.

BCC – Rigour

Rigour: Challenging

The terminology and expectations of the BCC: S for Grade 2 indicate a **challenging** degree of rigour. While the BCC: S at this level primarily focuses on investigating scientific concepts

through comparing, identifying, classifying, describing, and explaining phenomena, it does include several concepts and skills that place considerable demand on students' ability to engage in abstract thinking and reasoning. For example, the concept of physical versus chemical changes in Chemistry or the concepts of contact versus non-contact and balanced versus non-balanced forces in Physics require students to apply abstract ideas to concrete situations. This expectation is considered to be challenging at Grade 2 level.

Comparative Analysis

Both curricula have similar expectations with respect to breadth. Both focus on one fundamental concept in each of the four disciplines of Science and address, essentially, the same number and types of skills related to scientific inquiry. The content of the topics is virtually identical, as evidenced in the table below.

Table 3.13 Comparison of topic content in AC: S, Year 2 and BCC: S, Grade 2

Discipline	AC: Science (Year 2)	BCC: Science (Grade 2)
Biology	<i>Living things grow, change and have offspring similar to themselves</i>	<i>Living things have life cycles adapted to their environment</i>
Chemistry	<i>Different materials can be combined for a particular purpose</i>	<i>Materials can be changed through physical and chemical processes</i>
Earth and Space	<i>Earth's resources are used in a variety of ways</i>	<i>Water is essential to all living things, and it cycles through the environment</i>
Physics	<i>A push or a pull affects how an object moves or changes shape</i>	<i>Forces influence the motion of an object</i>

The wording of the statements in the BCC, combined with their supporting elaborations, tends to be more specific about the identity of the scientific concept that is intended to be the focus of teaching and learning, as well as the depth to which this concept is intended to be explored. For example, the Physics topic, which is essentially identical in both curricula, is supported by the following elaborations:

Table 3.14 Comparison of Physics elaborations in AC: S, Year 2 and BCC: S, Grade 2

AC: Science (Year 2) Physics	BCC: Science (Grade 2) Physics
<ul style="list-style-type: none"> <i>exploring ways that objects move on land, through water and in the air</i> <i>exploring how different strengths of pushes and pulls affect the movement of objects</i> <i>identifying toys from different cultures that use the forces of push or pull</i> <i>considering the effects of objects being pulled towards the Earth</i> 	<p><i>Types of forces:</i></p> <ul style="list-style-type: none"> <i>contact forces and at-a-distance forces:</i> <ul style="list-style-type: none"> <i>different types of magnets</i> <i>static electricity</i> <i>balanced and unbalanced forces:</i> <ul style="list-style-type: none"> <i>the way different objects fall depending on their shape (air resistance)</i> <i>the way objects move over/in different materials (water, air, ice, snow)</i> <i>the motion caused by different strengths of forces</i>

The BCC: S content and elaborations make it clear that the expectation of the curriculum is for students to gain experience with different types of forces and understand the difference between contact and non-contact forces, balanced and unbalanced forces, and their effects

on moving objects. The AC: S content and elaborations leave considerably more room for interpretation with respect to the expected depth of learning in relation to different types of forces, the differences between contact and non-contact forces, or balanced and unbalanced forces.

In contrast to the AC: S, which includes a Science as a Human Endeavour strand in addition to conceptual knowledge and skills, the BCC: S at Grade 2 level does not contain content that explicitly addresses the nature of Science, its purpose, and its use in and influence on society, with the exception of one Curricular Competency (*Consider some environmental consequences of their actions*) that can be considered to fall under the last category.

However, the BCC: S addresses a set of competencies, such as *Transfer and apply learning to new situations* and *Generate and introduce new or refined ideas when problem-solving* under the heading *Applying and innovating*, which has no equivalent in the AC.

The Curricular Competencies section of the BCC: S also includes content descriptions that do not strictly relate to skills, but rather describe dispositions or attitudes towards Science, such as *Demonstrate curiosity and a sense of wonder about the world*. Although such attitudes and dispositions are expressed as general aims of the Science curriculum in the introduction to the learning area, the AC: S does not specifically address these aspects of Science education in the year-level content description.

Additional Observations

BCC: S focus on First Peoples Knowledge and Perceptions and Place – see Year 10.

Year/Grade Level

Australian Curriculum: Year 6

British Columbia Curriculum: Grade 6

Learning Area/Subject

Australian Curriculum: Science (AC: S)

British Columbia Curriculum: Science (BCC: S)

Expectations: Knowledge and Skills

At Year 6 level, the AC: S expects students to compare and classify different types of observable changes to materials, analyse requirements for the transfer of electricity, describe how energy can be transformed from one form to another when generating electricity, explain how natural events cause rapid change to Earth's surface, describe and predict the effect of environmental changes on individual living things, and explain how scientific knowledge helps us to solve problems and inform decisions and identify historical and cultural contributions. With respect to Science inquiry skills, students are expected to follow procedures, to develop investigable questions, to design investigations into simple cause-and-effect relationships, to identify variables to be changed and measured and describe potential safety risks when planning methods. They are expected to collect, organise and interpret their data, identifying where improvements to their methods or research could improve the data, to describe and analyse relationships in data using appropriate representations, and to construct multimodal texts to communicate ideas, methods and findings.

At the end of Grade 6, the BCC: S expects students to know the basic structures and functions of body systems, be able to distinguish between homogeneous and

heterogeneous mixtures, identify some of the physical quantities on which common separation methods are based, understand Newton’s three laws of motion, the effects of balanced and unbalanced forces on moving objects and the nature of gravity, and know the position, motion, and components of our solar system. With respect to Curricular Competencies, students are expected to be able to identify questions and problems that can be answered and solved through scientific inquiry, with support plan and conduct such investigations while adhering to the notion of a fair test, observe, measure, and record data using appropriate tools including digital technologies, construct and use a variety of methods, including tables, graphs, and digital technologies, to identify and represent patterns or relationships in data, identify possible sources of error in and suggest improvements to their investigation methods, and communicate ideas, explanations, and processes in a variety of ways.

The distinct differences between the expectations of the two curricula with respect to the AC’s Science as a Human Endeavour strand and BC’s Curricular Competencies category *Applying and Innovating* apply to all year levels. These are addressed in detail in the preceding section on Year 2 / Grade 2. The same is true for the different style and use of elaborations and their impact on expected depth of coverage. The most notable difference between the two curricula at Year 6 / Grade 6 level is the fact that, in contrast to the other comparison points, the selection of content topics differs considerably. The BCC: S expects students to investigate more demanding scientific concepts than the AC: S at the same stage.

Measurement of Curriculum: Breadth, Depth, and Rigour

	BREADTH			DEPTH			RIGOUR		
	Limited	Fundamental	Comprehensive	Limited	Fundamental	Challenging	Limited	Moderate	Challenging
AC									
BCC									

AC – Breadth

Breadth: Comprehensive

For students in Year 6, the expectations of the AC: S are **comprehensive** with respect to breadth of coverage. The content descriptions address four topics in the *Science understanding* strand, relating to one fundamental concept from each of the four disciplines of Biology, Chemistry, Earth and Space Science, and Physics, seven Science inquiry skills and two concepts relating to Science as a human endeavour. Each of the content descriptions in the SU and SHE strand is supported by several elaborations that provide additional detail. The topics in the SU strand are defined broadly enough to allow for sustained and rich learning opportunities. The SIS content comprehensively addresses the skills required to explore the topics through an inquiry approach. Combined with the SHE content, which addresses the nature, purpose and use of Science, the overall breadth of the Year 6 content is considered comprehensive.

Table 3.15 Number of content descriptions and elaborations in AC: S, Year 6

AC: Science (Year 6) Strands	Content Descriptions	Elaborations
Science understanding	4	21
Science inquiry skills	7	18
Science as a human endeavour	2	17
Total:	13	56

BCC – Breadth

Breadth: Comprehensive

For students in Grade 6, the expectations of the BCC: S are **comprehensive** with respect to breadth of coverage. The curriculum addresses four Big Ideas representing four fundamental concepts from the disciplines of Biology, Chemistry, Earth and Space Science, and Physics. Its content section lists eight topics and three subtopics that clarify the intended focus of student investigation with respect to those Big Ideas. The Curricular Competencies section lists 27 skills, activities and dispositions that comprehensively address the skills required to explore the content topics using an inquiry approach, and include skills and activities under the rubric *Applying and Innovating* that go beyond the set of skills traditionally attributed to scientific inquiry (for example *Co-operatively design projects*, or *Transfer and apply learning to new situations*). All three sections of the curriculum (Big Ideas, Content Topics, and Curricular Competencies) are supported by elaborations that provide key questions and/or explanatory examples that indicate numerous opportunities for sustained and rich learning experiences.

Table 3.16 Number of content descriptions and elaborations in BCC: S, Grade 6

BCC: Science (Grade 6) Curriculum Elements	Content Descriptions	Elaborations
Big Ideas	4	10
Content Topics	8*	20*
Curricular Competencies	27	8*
Total:	39	38
(*) Only top-level bullet-points and major paragraphs were counted as constituting a single content description or elaboration.		

AC – Depth

Depth: Limited

The expectations of the AC: S Year 6 are limited with respect to the depth of coverage of knowledge and skills encountered in the curriculum. The flexibility relating to how scientific concepts are to be taught and the depth to which they are expected to be explored has already been addressed in the section on Year 2 / Grade 2, reinforcing that for Year 6, as demonstrated in section 3.2, the classification is justified.

BCC – Depth

Depth: Challenging

The expectations of the BCC: S for Grade 6 are **challenging** with respect to the depth of coverage of knowledge and skills encountered in the curriculum. The BCC: S includes extensive supporting information in the form of sample questions and explanatory and exemplifying elaborations. To use an example related to the discussion of AC: S – Depth in the previous section, the BCC: S topic for Chemistry expects students to not only understand the difference between homogeneous and heterogeneous mixtures, but also to link this concept to the physical characteristics of their components that are the basis for the techniques that allow the separation of such mixtures.

AC – Rigour

Rigour: Moderate

The terminology and expectations of the AC: S Year 6 indicate a **moderate** degree of rigour. The elaborations of all three strands of the AC: S provide numerous examples that require students to compare, classify, describe, and explain aspects of phenomena. However, only a limited number of examples provides evidence for engaging students in abstract thinking and reasoning, or a level of individual planning, critical analysis and evaluation of investigations that would justify a **challenging** level of rigour at this year level.

BCC – Rigour

Rigour: Moderate

The terminology and expectations of the BCC: S Grade 6 indicate a **moderate** degree of rigour. The content descriptions and elaborations of Curricular Competencies and content topics of the BCC: S provide numerous examples that require students to compare, classify, describe, and explain aspects of phenomena. However, only a limited number of examples provides evidence of engaging students in abstract thinking and reasoning, or a level of individual planning, critical analysis and evaluation of investigations that would justify a **challenging** level of rigour at this year level.

Comparative Analysis

Both curricula have similar expectations with respect to breadth. The AC: S and BCC: S focus on one fundamental concept in each of the four disciplines of Science and address, essentially, the same number and types of skills related to scientific inquiry with respect to the categories of *Questioning and predicting*, *Planning and conducting*, *Processing and analysing data and information*, and *Communicating*. A significant difference is noticeable in the category *Evaluating*, where the BCC: S is more explicit as to the types of skills that are involved in reflecting on the quality of a scientific investigation, and includes one skill that demonstrates a higher level of rigour than is expected in the AC: S. *Identify some of the assumptions in secondary sources* indicates a level of engagement with secondary sources and a cognitive demand imposed on students that is not required in the AC: S until secondary school.

A similar situation is observed with respect to the content of the topics. The scientific concepts addressed in the AC: S for Year 6 are arguably less demanding than those addressed in Grade 6 in the BCC: S. The AC: S Year 6 topics are generally addressed in

earlier grades in the BCC: S and the BCC: S Grade 6 topics tend to be covered in later years in the AC, as evidenced in the tables below.

Table 3.17 Comparison of topics in AC: S, Year 6 and equivalent topics in BCC: S, Grade 6

Discipline	AC: Science (Year 6)	Equivalent topic(s) in BCC: Science (Grade 6)
Biology	<i>The growth and survival of living things are affected by physical conditions of their environment</i>	Grade 4: <i>All living things sense and respond to their environment.</i> Grade 5: <i>Multicellular organisms have organ systems that enable them to survive and interact within their environment.</i>
Chemistry	<i>Changes to materials can be reversible or irreversible</i>	No strict equivalent. Phase changes are first addressed in Grade 4, mixtures in Grade 5 and chemical changes in Grade 7
Earth & Space	<i>Sudden geological changes and extreme weather events can affect Earth's surface</i>	No strict equivalent. The rock cycle is addressed in Grade 5, climate in Grade 7
Physics	<i>Electrical energy can be transferred and transformed in electrical circuits and can be generated from a range of sources</i>	Grade 4: <i>Energy can be transformed.</i> (including electrical energy, transformation devices and the concept of conservation of energy)

Table 3.18 Comparison of topics in BCC: S, Grade 6 and equivalent topics in AC: S, Year 6

Discipline	BCC: Science (Grade 6)	Equivalent topic(s) in AC: Science (Year 6)
Biology	<i>Multicellular organisms rely on internal systems to survive, reproduce, and interact with their environment.</i>	Year 8: <i>Multi-cellular organisms contain systems of organs carrying out specialised functions that enable them to survive and reproduce</i>
Chemistry	<i>Everyday materials are often mixtures.</i> (including homogeneous vs heterogeneous and separation techniques)	Year 7: <i>Mixtures, including solutions, contain a combination of pure substances that can be separated using a range of techniques</i>
Earth and Space	<i>The solar system is part of the Milky Way, which is one of billions of galaxies.</i>	Year 10: <i>The universe contains features including galaxies, stars and solar systems, and the Big Bang theory can be used to explain the origin of the universe</i>
Physics	<i>Newton's three laws of motion describe the relationship between force and motion.</i>	Year 10: <i>The motion of objects can be described and predicted using the laws of physics</i>

The expected depth of understanding of scientific concepts is generally higher in the BCC: S than it is in the AC: S at Year 6 level. One example is found in the chemical sciences.

Table 3.19 Science elaborations in Chemistry, AC: S, Year 6 and BCC: S, Grade 6

AC: Science Elaborations in Chemistry (Year 6)	BCC: Science Elaborations in Chemistry (Grade 6)
<p>Changes to materials can be reversible or irreversible</p> <ul style="list-style-type: none"> • describing what happens when materials are mixed • investigating the solubility of common materials in water • investigating the change in state caused by heating and cooling of a familiar substance • investigating irreversible changes such as rusting, burning and cooking • exploring how reversible changes can be used to recycle materials • investigate reversible reactions such as melting, freezing and evaporating 	<p>Everyday materials are often mixtures</p> <ul style="list-style-type: none"> • heterogeneous mixtures: suspensions (e.g., salad dressing), emulsions (e.g., milk), colloids (e.g., aerosols) • mixtures: <ul style="list-style-type: none"> - separated using a difference in component properties <ul style="list-style-type: none"> ▪ density (e.g., centrifuge or settling, silt deposits in a river delta, tailings ponds, Roman aqueduct settling sections) ▪ particle size (e.g., sieves, filters) - local First Peoples knowledge of separation and extraction methods <ul style="list-style-type: none"> ▪ historical and current First Peoples use of separation and extraction methods (e.g., eulachon oil, extraction of medicines from plants, pigments, etc.)

The information provided by the BCC: S in the form of Big Ideas, topics and elaborations shows that students are expected to understand the difference between mixtures and pure substances, homogeneous and heterogeneous mixtures and which properties of substances can serve as the basis for separating mixtures. The AC: S content description and elaborations place less emphasis on the concept. For example, the content description suggests that *reversibility* is the topic to be explored; however, the elaborations address several different scientific concepts that could be associated with the question of reversibility, but none is based on that topic. The first two points suggest investigating mixing materials or solubility in water. In these cases, reversibility could be addressed within the concept of physical versus chemical change (i.e. salt dissolves in water and can be recovered by evaporation, but solid sodium mixed with water cannot be recovered in that way since it reacts with water), or it could be addressed within the concept of entropy (i.e. a sugar cube dissolves in water, remaining essentially the same substance, but it cannot reform in the form of a cube). One elaboration suggests the investigation of certain chemical reactions as *irreversible* changes. However, it is not clear that students would develop an understanding of why certain chemical reactions are considered reversible and others not. Two more elaborations deal with changes of state as examples of reversible transformations. If the intended target concept was the difference between physical and chemical changes, then reversibility is neither a sufficient nor a suitable indicator of this difference. Although all of the suggested activities lend themselves to investigations that include observation, questioning, predicting, collecting and recording data and communicating results, none would lead to a reasonable understanding of the phenomena without an understanding of the particulate nature of matter. In the BCC: S, this fundamentally important concept is introduced in Grade 3 (*All matter is made of particles*), whereas in the AC: S it is first addressed in Year 8 (*Properties of the different states of matter can be explained in terms of the motion and arrangement of particles*).

The relationship between the ways in which content descriptions and elaborations provide information about the selected topics and the expected depth and rigour in both curricula has

already been addressed in the section addressing Year 2 / Grade 2. This applies equally to Year 6 / Grade 6.

Similarly, the differences between the two Science curricula with respect to the AC's Science as a Human Endeavour strand and British Columbia's Curricular Competencies category *Applying and innovating* are identical for the Year 6 level.

It is worth re-emphasising the fact that the BCC: S addresses certain attitudes and dispositions, indicating that the Grade 6 competencies are regarded as particularly important. These attitudes and dispositions are relevant to Science and to the development of 21st century skills such as Self-directed Learning, Open-mindedness (Tolerance) and Critical Thinking: *Demonstrate a sustained curiosity about a scientific topic or problem of personal interest, Demonstrate an openness to new ideas and consideration of alternatives and Demonstrate an understanding and appreciation of evidence.*

Additional Observations

BCC: S focuses on *First Peoples Knowledge and Perceptions* and *Place* – see Year 10.

Year/Grade Level

Australian Curriculum: Year 10

British Columbia Curriculum: Grade 10

Learning Area/Subject

Australian Curriculum: Science (AC: S)

British Columbia Curriculum: Science (BCC: S)

Expectations: Knowledge and Skills

At Year 10 level, the AC: S expects students to analyse how the periodic table organises elements and to use it to make predictions about the properties of elements, explain how chemical reactions are used to produce particular products and how different factors influence the rate of reactions, explain the concept of energy conservation and represent energy transfer and transformation within systems, apply relationships between force, mass and acceleration to predict changes in the motion of objects, describe and analyse interactions and cycles within and between Earth's spheres, evaluate the evidence for scientific theories that explain the origin of the universe and the diversity of life on Earth, explain the processes that underpin heredity and evolution, analyse how the models and theories they use have developed over time and discuss the factors that prompted their review. With regard to scientific inquiry skills, students are expected to develop questions and hypotheses and independently design and improve appropriate methods of investigation, explain how they have considered reliability, safety, fairness and ethical actions in their methods, identify where digital technologies can be used to enhance the quality of data, select evidence and develop and justify conclusions, identify alternative explanations for findings and explain any sources of uncertainty, evaluate the validity and reliability of claims made in secondary sources with reference to currently held scientific views, construct evidence-based arguments and select appropriate representations and text types to communicate Science ideas for specific purposes.

By the end of Grade 10, the BCC: S expects students to know the basic structure and function of DNA, genes and chromosomes, explain simple patterns of inheritance and mechanisms responsible for the diversity of life, know applications of genetics, understand

the law of conservation of mass and the rearrangement of atoms in chemical reactions, know the fundamental principle of acid-base reactions and practical applications and implications of chemical reactions – including First Peoples perspectives – understand the concept of energy transformation and its local and global impacts from related technologies, including nuclear energy, know the current theory of the formation of the universe and how astronomical data and collection methods contributed to its understanding.

As far as the Curricular Competencies are concerned, students are expected to be able to make observations aimed at identifying their own questions, formulate multiple hypotheses and predict multiple outcomes, collaboratively and individually plan, select, and use appropriate investigation methods while assessing risks and addressing ethical, cultural, and/or environmental issues, select and use appropriate equipment, including digital technologies, to systematically and accurately collect and record data, analyse patterns, trends and connections in data, including describing relationships between dependent and independent variables and identifying inconsistencies, construct, analyse, and interpret graphs, models, and/or diagrams and use knowledge of scientific concepts to draw conclusions that are consistent with evidence. They are expected to be able to evaluate their methods and experimental conditions, identify sources of error or uncertainty, confounding variables, and possible alternative explanations and conclusions, evaluate the validity and limitations of a model or analogy in relation to the phenomenon modelled, demonstrate an awareness of assumptions, question information given, and identify bias in their own work and secondary sources, critically analyse the validity of information in secondary sources and evaluate the approaches used to solve problems consider social, ethical, and environmental implications of the findings from their own and others' investigations, formulate physical or mental theoretical models to describe a phenomenon, and communicate scientific ideas and claims for a specific purpose and audience by constructing evidence-based arguments and using appropriate scientific language, conventions, and representations.

The differences between the expectations of the two Science curricula with respect to AC's Science as a Human Endeavour strand and BC's Curricular Competencies category *Applying and Innovating* apply to all year levels and are discussed in detail in the earlier section on Year 2 / Grade 2. The same is true for the different nature and use of elaborations and the consequent effect on expected depth of coverage.

Apart from the general distinctions between the two curricula identified already, it is important to note that at Year 10 they are remarkably similar with respect to content, breadth and depth. This stands in contrast to the considerable differences that have been identified at Year 6 / Grade 6.

Measurement of Curriculum: Breadth, Depth and Rigour

	BREADTH			DEPTH			RIGOUR		
	Limited	Fundamental	Comprehensive	Limited	Fundamental	Challenging	Limited	Moderate	Challenging
AC									
BCC									

AC – Breadth

Breadth: Comprehensive

For students in Year 10, the expectations of the AC: S are **comprehensive** with respect to breadth of coverage. The content descriptions address eight topics in the *Science understanding* strand, relating to two fundamental concepts from each of the four disciplines of Biology, Chemistry, Earth and Space Science, and Physics, eight Science inquiry skills and four concepts relating to Science as a human endeavour. Each of the content descriptions in the SU and SHE strand is supported by several elaborations that provide additional detail. Although sometimes loosely connected, the two topics within each of the disciplinary fields of the SU strand clearly address different scientific concepts and are defined broadly enough to be counted as separate topics and allow for sustained and rich learning opportunities. The SIS content comprehensively addresses the skills required to explore the topics through an inquiry approach. Combined with the SHE content, which addresses the nature, purpose and use of Science, the overall breadth of the Year 10 content is considered **comprehensive**.

Table 3.20 Number of content descriptions and elaborations in AC: S, Year 10

AC: Strands (Year 10)	Content Descriptions	Elaborations
Science understanding	8	37
Science inquiry skills	8	29
Science as a human endeavour	4	24
Total:	20	90

BCC – Breadth

Breadth: Comprehensive

For students in Grade 10, the breadth of expectations in the BCC: S is regarded as **comprehensive**. The curriculum addresses four Big Ideas representing four fundamental concepts from the disciplines of Biology, Chemistry, Earth and Space Science, and Physics. Its content section lists sixteen topics and seven subtopics that clarify the intended focus of student investigation with respect to those Big Ideas. Except for the Earth and Space Science topic, the Big Ideas are defined in such broad terms that they address two or more fundamental scientific concepts that could each be considered to merit its own Big Idea. For example, in Biology *Genes are the foundation for the diversity of living things* is supported by the topics *DNA structure and function*, *genes and chromosomes*, *simple patterns of inheritance*, *mechanisms for the diversity of life*, and *applications of genetics and ethical considerations*, thus addressing several fundamental scientific concepts which, although connected, do not rely on each other and have been discovered independently (Watson and Crick's double helix, Mendel's inheritance patterns and Darwin's Theory of Evolution). The Curricular Competencies section lists 30 skills, attitudes and dispositions that not only comprehensively address the skills required to explore the content topics through an inquiry approach, but also include skills and activities under the rubric *Applying and Innovating* that go beyond the set of skills traditionally attributed to scientific inquiry (e.g. *Contribute to care for self, others, community, and world through individual or collaborative approaches* or *Consider the role of scientists in innovation*). All three sections of the curriculum (Big Ideas,

Content Topics, and Curricular Competencies) are supported by elaborations that provide key questions and/or explanatory examples which offer numerous opportunities for sustained and rich learning experiences.

Table 3.21 *Number of content descriptions and elaborations in BCC: S, Grade 10*

BCC: Science (Grade 10) Curriculum Elements	Content Descriptions	Elaborations
Big Ideas	4	12
Content Topics	16*	19*
Curricular Competencies	30	32
Total:	50	63
* Only top-level bullet-points were counted as constituting a single content description or elaboration.		

AC – Depth

Depth: Challenging

The expectations of the AC: S Year 10 are regarded as **challenging** in terms of the depth of coverage of knowledge and skills. Although the matter of the non-mandatory nature of the elaborations, which are the primary source of information for gauging the expected depth and rigour of the curriculum, also applies in Year 10, the types of concepts addressed in these elaborations and the wealth of scientific terminology used in the wording of the suggested learning activities clearly demonstrate an expected in-depth coverage of the topics that goes beyond **fundamental**.

BCC – Depth

Depth: Challenging

The expectations of the BCC: S Grade 10 are **challenging** with respect to the depth of coverage of knowledge and skills. The BCC: S provides significant supporting information in the form of sample questions and explanatory and exemplifying elaborations. Together, these indicate sophisticated expectations with respect to the depth to which the topics are intended to be covered. For example, the content elaborations for the topic *simple patterns of inheritance* list possible illustrations of the content as *Mendelian genetics, Punnett squares, complete dominance, co-dominance, incomplete dominance, sex-linked inheritance*. Most of the concepts addressed in this list go beyond the most fundamental aspects of inheritance. Furthermore, some of the sample questions supporting inquiry with students, such as *What is the probability of offspring having specific genetic traits?* and the elaborations supporting some of the Physics topics, such as *kinetic: energy of motion ($KE=1/2mv^2$)*, provide evidence that the relevant concepts are intended to be explored quantitatively, not just qualitatively.

AC – Rigour

Rigour: Moderate

In Year 10, terminology and expectations of the AC: S indicate a **moderate** degree of rigour. The elaborations of all three strands of the AC: S provide numerous examples of considerable demand on students' ability to engage in abstract thinking and reasoning.

Students are expected to research, plan investigations, analyse data, and apply critical, creative, and collaborative skills to solve problems and apply solutions to real world issues. However, the lack of evidence for quantitative analysis and mathematical application of scientific concepts is the reason for describing the level of rigour as **moderate**.

BCC – Rigour

Rigour: Challenging

The terminology and expectations of the BCC: S for Grade 10 indicate a **challenging** degree of rigour. The key questions and elaborations of the Big Ideas and Curricular Competencies provide evidence that students are engaged in activities which place considerable demand on students' ability to engage in abstract thinking and reasoning. Students are expected to research, plan investigations, analyse data, and apply critical, creative, and collaborative skills to solve problems and apply solutions to real world issues.

Comparative Analysis

The AC and BCC have similar expectations with respect to breadth, depth and rigour. Apart from the slight variation in sequence, the number and choice of topics are very much alike.

Table 3.22 Comparison of Science understanding content in AC: S, Year 10 and BCC: S, Grade 10

Discipline	AC: Science (Year 10)	BCC: Science (Grade 10)
Biology	<p><i>Transmission of heritable characteristics from one generation to the next involves DNA and genes</i></p> <p><i>The theory of evolution by natural selection explains the diversity of living things and is supported by a range of scientific evidence</i></p>	<p><i>Genes are the foundation for the diversity of living things.</i></p> <ul style="list-style-type: none"> • <i>DNA structure and function;</i> • <i>genes and chromosomes;</i> • <i>simple patterns of inheritance;</i> • <i>applications of genetics and ethical considerations;</i> • <i>mechanisms for the diversity of life:</i> <ul style="list-style-type: none"> — <i>mutation and its impact on evolution</i> — <i>natural and artificial selection</i>
Chemistry	<p><i>The atomic structure and properties of elements are used to organise them in the Periodic Table</i></p> <p><i>Different types of chemical reactions are used to produce a range of products and can occur at different rates</i></p>	<p><i>Chemical processes require energy change as atoms are rearranged.</i></p> <ul style="list-style-type: none"> • <i>rearrangement of atoms in chemical reactions;</i> • <i>law of conservation of mass;</i> • <i>energy change during chemical reactions;</i> • <i>acid-base chemistry;</i> • <i>practical applications and implications of chemical processes, including First Peoples perspectives</i>
Physics	<p><i>Energy conservation in a system can be explained by describing energy transfers and transformations</i></p> <p><i>The motion of objects can be described and predicted using the laws of physics</i></p>	<p><i>Energy is conserved and its transformation can affect living things and the environment.</i></p> <ul style="list-style-type: none"> • <i>law of conservation of energy;</i> • <i>transformation of potential and kinetic energy;</i> • <i>local and global impacts of energy transformations from technologies;</i> • <i>First Peoples perspectives on energy;</i> • <i>nuclear energy and radiation:</i> <ul style="list-style-type: none"> — <i>fission versus fusion;</i> — <i>technologies and applications, and implications;</i>
Earth and Space	<p><i>The universe contains features including galaxies, stars and solar systems, and the Big Bang theory can be used to explain the origin of the universe</i></p> <p><i>Global systems, including the carbon cycle, rely on interactions involving the biosphere, lithosphere, hydrosphere and atmosphere</i></p>	<p><i>The formation of the universe can be explained by the big bang theory.</i></p> <ul style="list-style-type: none"> • <i>formation of the universe:</i> <ul style="list-style-type: none"> — <i>big bang theory;</i> — <i>components of the universe over time;</i> — <i>astronomical data and collection methods</i>

The BCC: S topics tend to be more closely related to each other than those in the AC: S, not only within but also across the four disciplines of Science. In the BCC: S, the chemical and physical sciences have a common theme (energy) which would suggest an integrated approach to teaching those topics and is likely to facilitate students' ability to form a deeper understanding of the underlying scientific concepts. Some of the scientific concepts addressed in the BCC: S are inherently more demanding than related topics in the AC: S. For example, the BCC: S topic *nuclear energy and radiation: fission versus fusion*, requires a deeper exploration of the subatomic nature of matter than the AC: S Year 9 topic ... *natural radioactivity arises from the decay of nuclei in atoms* or the learning activities suggested by the elaborations of the AC: S Year 10 content descriptions for the physical or chemical sciences. Such depth is evident in AC: S at senior secondary (Years 11 and 12) level.

The BCC: S elaborations provide more detail regarding identity of scientific concepts to be investigated and the expected depth of their coverage. This is particularly noticeable with respect to the inclusion of mathematics in the exploration of the chosen topics. Additionally, the BCC: S elaborations include mathematical formulas and inquiry questions that require students to answer quantitative questions, demonstrating that a rigorous mathematical treatment of scientific concepts is an expectation of the BCC: S.

A further indicator of the expectations of depth and rigour in the BCC: S is given by the sample inquiry questions that support the Big Ideas and Curricular Competencies. Many of those questions are framed in a way that could be considered challenging at any year level and may well encourage curiosity, promote deep thinking and demand sustained engagement with the topic. Some examples are:

- How does DNA result in biodiversity?
- Where does energy come from and what happens to it?
- What evidence supports the big bang theory?

Some of the attitudes addressed in the Curricular Competencies, such as *Demonstrate a sustained intellectual curiosity about a scientific topic or problem of personal interest*, are further evidence that deep and sustained engagement with scientific questions and problems is an expected outcome of the BCC: S.

Additional Observations

The BCC: S places a sustained focus on *First Peoples knowledge and perspectives and place*. Given the fact that those themes feature prominently in all learning areas, they can be considered comparable to the AC's Cross-Curricular Priority of *Aboriginal and Torres Strait Islander Histories and Cultures*. While many content topics in the BCC: S lend themselves ideally to the discussion of *First Peoples knowledge and perspectives* and provide rich and, judging by the elaborations, well-informed learning opportunities for students, such links to the Curricular Competencies are sometimes less clear and potentially pose considerable challenges for teachers and students alike. For example, BCC: S Grade 10 lists the Curricular Competency *Apply First Peoples perspectives and knowledge, other ways of knowing, and local knowledge as sources of information, where ways of knowing refers to the various beliefs about the nature of knowledge that people have. They can include, but are not limited to, First Peoples, gender-related, subject/discipline-specific, cultural, embodied, and intuitive beliefs about knowledge*. Critical considerations will be the availability of experts to teach this material, how these *other ways of knowing* are intended to

be applied to current scientific problems, and what the intended purpose or expected outcome of this application is.

Although *place* as an important influence on an individual's perception of the world is a valid notion of scientific investigation, the link between *place* and Science suggested by some of the Curricular Competencies is not always obvious, as for instance in *Express and reflect on a variety of experiences, perspectives, and worldviews through place*.

d) Humanities and Social Sciences

Comparative Curricula

Australian Curriculum: Humanities and Social Sciences

Australian Curriculum: Civics and Citizenship

Australian Curriculum: Economics and Business

Australian Curriculum: Geography

Australian Curriculum: History

British Columbia Curriculum: Social Studies

Year/Grade Level

Australian Curriculum: Year 2

British Columbia Curriculum: Grade 2

Learning Area/Subject

Australian Curriculum: Humanities and Social Sciences (AC: HASS)

British Columbia Curriculum: Social Studies (BCC: SS)

Expectations: Knowledge and Skills

The expectations of the AC: HASS in Year 2 involve the topic: *Our past and present connections to people and places*. The content is organised into two strands: *inquiry and skills*, and *knowledge and understanding*. The inquiry and skills strand develops students' capacity to question, research, analyse, evaluate and reflect, and communicate. The knowledge and understanding strand is divided into two sub-strands: History and Geography. These sub-strands are interrelated and allow Year 2 students to begin to explore near and distant places with which they are familiar, and to investigate the connections between past and present, and between people and places. The three guiding inquiry questions are:

- What does my place tell me about the past and present?
- How are people connected to their place and other places, past or present?
- How has technology affected daily life over time and the connections between people in different places?

The expectations of the BCC: SS in Grade 2 centre on the topic: *Regional and global communities*. The content is organised beneath three guiding Big Ideas:

- Local actions have global consequences, and global actions have local consequences
- Canada is made up of many diverse regions and communities
- Individuals have rights and responsibilities as global citizens.

The stated aim is to allow teachers and students to “go in directions of particular interest or local relevance” (BCME, 2016). To this end, the mandated knowledge content for Grade 2 focuses upon communities, with a particular emphasis upon Canadian contexts and relationships.

The AC: HASS and BCC: SS use similar concepts to underpin student learning. In Year 2 AC: HASS these are significance, continuity and change, cause and effect, place and space, interconnections, and perspectives and action. In Grade 2 BCC: SS, these are significance, evidence, continuity and change, cause and consequence, perspective, and ethical judgment.

Measurement of Curriculum: Breadth, Depth and Rigour

	BREADTH			DEPTH			RIGOUR		
	Limited	Fundamental	Comprehensive	Limited	Fundamental	Challenging	Limited	Moderate	Challenging
AC									
BCC									

AC – Breadth

Breadth: Comprehensive

For students in Year 2, the expectations of the AC: HASS are **comprehensive** in relation to breadth of coverage. The concepts and skills of AC: HASS allow learners to build upon experiences from the curriculum in Foundation and Year 1 as they continue to explore their personal past and present in a way which aligns with Paul Hanna’s *expanding communities* model for social science education (Stallones, 2003). The AC: HASS presents the concepts within the overview statements for each sub-strand, with no glossary, explanation, elaboration or direct association with the listed discipline-specific descriptions of knowledge and understanding. The skill categories each have one or more elements, each with one or more elaborations.

Table 3.23 Number of content descriptions in AC: HASS, Year 2

Year 2	Humanities and Social Sciences	
General Capabilities	7	
Cross-Curriculum Priorities	3	
Inquiry questions	3	
Content description: inquiry and skills	10	
Elaborations	35	
Year 2	History	Geography
Key concepts	5	4
Inquiry questions	3	3
Content description: knowledge and understanding	3	5
Elaborations	11	14

BCC – Breadth

Breadth: Comprehensive

For students in Grade 2, the expectations of the BCC: SS are **comprehensive** in relation to breadth of coverage. The content and competencies of BCC: SS allow learners to build upon experiences from the curriculum in Kindergarten and Grade 1 as they continue to explore their personal past and present in a way that also aligns with Hanna’s *expanding communities* model for social science education. The BCC: SS is shaped by Big Ideas and concepts, supported by optional elaborations.

Table 3. 24 *Number of content statements in BCC: SS, Grade 2*

Grade 2	Social Studies
Big Ideas	3
Curricular Competencies	7
Elaborations	29
Content	6
Elaborations	26

AC – Depth

Depth: Fundamental

The expectations of the AC: HASS for Year 2 are rated as **fundamental**, based on the details of knowledge and topics demanded in the curriculum. In Year 2, the content descriptions of the AC: HASS are limited to eight areas of knowledge and understanding associated with the topic *Our past and present connections to people and places*. HASS is a single subject area with three overarching inquiry questions and a single list of targeted skills. The History and Geography sub-strands are presented separately with their own additional inquiry questions. The depth and detail to which learners should explore each content statement are indicated within its wording, with further possible indicators of depth provided through multiple elaborations which operate as suggestions for classroom implementation. The inquiry skills in the content descriptions focus mainly upon simple observations, interpretations and communication.

BCC – Depth

Depth: Fundamental

Based on the details of knowledge and topics demanded in the curriculum, the expectations of the BCC: SS are considered to be **fundamental**. In Grade 2, the content of the BCC: SS is limited to six areas associated with the topic *Regional and global communities* within the framework of three Big Ideas expressed as statements. The depth to which learners may explore this topic is suggested through the various elaborations associated with each content point. These elaborations are sample topics and predominantly engage learners in the collection of topic-specific information. The elaborations for the listed Curricular Competencies present simple sample activities requiring comparison, collection and explanation, sometimes with teacher or peer support.

AC – Rigour

Rigour: Moderate

The cognitive demand placed on Year 2 students in the AC: HASS indicates a **moderate** degree of rigour. The directive terms and expectations on Year 2 students throughout the content descriptions of AC: HASS are associated with recall, recount and simple description and application. This corresponds to the expectations of cognitive development for students in Year 2. The Year 2 achievement standards for AC: HASS, written for a typical student, are dominated by the terms *identify, describe, sequence*, with limited use of *analyse, interpret* and *reflect*.

BCC – Rigour

Rigour: Limited

The cognitive demand placed on Grade 2 students in the BCC: SS indicates a **limited** degree of rigour. The directive terms and expectations of students are predominantly associated with recall, recount and simple description and application and this corresponds to the cognitive development of students at Grade 2. There is no indication of required or indicative achievement standards for BCC: SS; rather, the curriculum website explains that “in Social Studies and Science, students will write in-class exams”, and “are expected to excel” (BCME, 2016b). These in-class examinations in BCC: SS are scheduled for the end of Grade 4 and Grade 7 only.

Comparative Analysis

Both the AC: HASS and BCC: SS are designed to equip students with knowledge, understanding and skills associated with the people, places, issues and events that have shaped their world. Each curriculum draws upon the *expanding communities* model to shape the context, scope and developmental sequence to be followed from Foundation to Year 10 or Kindergarten to Grade 10. The points at which the AC: HASS and BCC: SS either converge or diverge along this sequence, particularly at the comparative points of Year 2/Grade 2, Year 6/Grade 6 and Year 10/Grade 10 are detailed within the comparative analysis for Year 10/Grade 10.

Year/Grade Level

Australian Curriculum: Year 6

British Columbia Curriculum: Grade 6

Learning Area/Subject

Australian Curriculum: Humanities and Social Sciences (AC: HASS)

British Columbia Curriculum: Social Studies (BCC: SS)

Expectations: Knowledge and Skills

The expectations of the AC: HASS in Year 6 involve the topic: *Australia in the past and present and its connection with a diverse world*. The content is organised into two strands: *inquiry and skills* and *knowledge and understanding*. The *inquiry and skills* strand develops students’ capacity to question, research, analyse, evaluate and reflect, and communicate. The *knowledge and understanding* strand is divided into four sub-strands: History, Geography, Civics and Citizenship, and Economics and Business. These sub-strands are interrelated and allow Year 6 students to explore events, developments and issues that shape Australia as a democratic nation, and to understand how they are interconnected with diverse people and places across the globe. The three guiding inquiry questions are:

- How have key figures, events and values shaped Australian society, its system of government and citizenship?
- How have experiences of democracy and citizenship differed between groups over time and place, including those from and in Asia?
- How has Australia developed as a society with global connections, and what is my role as a global citizen?

The expectations of the BCC: SS in Grade 6 involve the topic: *Global issues and governance*. The content is organised beneath four guiding Big Ideas:

- Economic self-interest can be a significant cause of conflict among people and governments
- Complex global problems require international co-operation to make difficult choices for the future
- Systems of government vary in their respect for human rights and freedoms
- Media sources can both positively and negatively affect our understanding of important events and issues.

The stated aim is to allow teachers and students to *go in directions of particular interest or local relevance* (BCME, 2016c). To this end, the mandated knowledge content for Grade 6 focuses upon global issues, processes and systems.

Similar concepts underpin students' learning in the AC: HASS and BCC: SS. In Year 6 AC: HASS, these are: significance, continuity and change, cause and effect, place and space, interconnections, roles, rights and responsibilities, and perspectives and action. In Grade 6 BCC: SS, they are: significance, evidence, continuity and change, cause and consequence, perspective, and ethical judgement.

Measurement of Curriculum: Breadth, Depth and Rigour

	BREADTH			DEPTH			RIGOUR		
	Limited	Fundamental	Comprehensive	Limited	Fundamental	Challenging	Limited	Moderate	Challenging
AC									
BCC									

AC – Breadth

Breadth: Comprehensive

For students in Year 6, the expectations of the AC: HASS are **comprehensive** in relation to breadth of coverage. The concepts and skills of AC: HASS Year 6 allow learners to build upon experiences from the curriculum in Year 3, Year 4 and Year 5 as they continue to explore their personal past and present. This aligns with Hanna's *expanding communities* model for social science education (Stallones, 2003). In the secondary curriculum, the AC: HASS expands to include four sub-strands (History, Geography, Civics and Citizenship, Economics and Business) and presents the concepts within the overview statements for each sub-strand, with no glossary, explanation, elaboration or direct association with the listed discipline-specific descriptions of knowledge and understanding. Each skill category has one or more elements, and each of these has one or more elaborations.

Table 3. 25 Number of content descriptions in AC: HASS, Year 6

Year 6	Humanities and Social Sciences			
General Capabilities	7			
Cross-Curriculum Priorities	3			
Inquiry questions	3			
Content description: inquiry and skills	12			
Elaborations	54			
Year 6	History	Geography	Civics and Citizenship	Economics and Business
Key concepts	6	5	3	4
Inquiry questions	4	3	3	3
Content description: knowledge and understanding	4	4	6	3
Elaborations	17	13	19	10

BCC – Breadth

Breadth: Fundamental

For students in Grade 6, the expectations of the BCC: SS are **comprehensive** in relation to breadth of coverage. The content and competencies of BCC: SS in Grade 6 allow learners to build upon experiences from the curriculum in Grades 2, 3 and 4. The BCC: SS is shaped by Big Ideas and concepts, supported by optional elaborations.

Table 3.26 Number of content statements in BCC: SS, Grade 6

Grade 6	Social Studies
Core Competencies	3
Big Ideas	4
Curricular Competencies	8
Elaborations	22
Content	9
Elaborations	67

AC – Depth

Depth: Fundamental

The expectations of the AC: HASS for Year 6 are evaluated as **fundamental**, based on the details of the knowledge and topics demanded in the curriculum. In Year 6, the content descriptions of the AC: HASS expand to 17 areas of knowledge and understanding associated with the topic *Australia in the past and present and its connection with a diverse world*. The depth to which learners should explore each content statement is indicated within its wording, with further possible indicators of depth provided through multiple elaborations which operate as suggestions for classroom implementation. The content descriptions and associated inquiry questions primarily focus upon the collection and recall of information and presentation of narratives and explanations.

BCC – Depth

Depth: Fundamental

Based on the details of knowledge and topics demanded in the curriculum, the expectations of the BCC: SS are regarded as **fundamental**. In Grade 6, the content of the BCC: SS is limited to six areas associated with the topic *Global issues and governance*. The depth to which learners may explore this topic is indicated through the various elaborations associated with each content point. These elaborations are *sample* topics and predominantly engage learners in the collection of specific information. The elaborations for the listed Curricular Competencies present simple sample activities requiring recall, recognition and simple analysis and argument.

AC – Rigour

Rigour: Moderate

The cognitive demand placed on Year 6 students in the AC: HASS indicates a **moderate** degree of rigour. The directive terms and expectations of students seen in the content descriptions are predominantly associated with recall, recount, explanation and application. This corresponds to the cognitive development of students at Year 6. The Year 6 achievement standards for AC: HASS, written for students in this age group, are dominated by the terms *identify, explain, describe, compare* and *locate*, with some use of *analyse, interpret, reflect* and *take action*.

BCC – Rigour

Rigour: Moderate

The cognitive demand placed on Grade 6 students in the BCC: SS indicates a **moderate** degree of rigour. The directive terms and expectations on students are predominantly associated with recall, recount and explanation, along with simple comparison and interpretation. This corresponds to the cognitive development of students at Grade 6. There is no indication of required or indicative achievement standards for BCC: SS; rather, the curriculum website indicates that in “social studies and science, students will write in-class exams, and are expected to excel” (BCME, 2016c). These in-class examinations in BCC: SS are scheduled for the end of Grade 4 and Grade 7 only.

Comparative Analysis

Both curricula are designed to equip students with knowledge, understanding and skills associated with the people, places, issues and events that have shaped their world. Each curriculum draws upon the *expanding communities* model to shape the context, scope and developmental sequence to be followed from Foundation to Year 10 or Kindergarten to Grade 10. The points at which the AC: HASS and BCC: SS either converge or diverge along this sequence, particularly at the comparative points of Year 2/Grade 2, Year 6/Grade 6 and Year 10/Grade 10, are detailed within the comparative analysis for Year 10/Grade 10.

Year/Grade Level

Australian Curriculum: Year 10

British Columbia Curriculum: Grade 10

Learning Area/Subject

Australian Curriculum: History (AC: H), Geography (AC: G), Civics and Citizenship (AC: CC), Economics and Business (AC: EB)

British Columbia Curriculum: Social Studies (BCC: SS)

Expectations: Knowledge and Skills

In the AC, the Humanities and Social Sciences (HASS) diverge in Year 7 to form four discrete subject areas for Year 7 through to Year 10. Students are able to learn History (AC: H), Geography (AC: G), Civics and Citizenship (AC: CC) and Economics and Business (AC: EB).

In Year 10, the AC: H offers a focus on the history of the modern world and Australia from 1918 to the present, with an emphasis on Australia in its global context. The content is organised into two strands: *inquiry and skills* and *knowledge and understanding*. The *inquiry and skills* strand develops students' capacity in chronology, terms and concepts, historical questions and research, analysis and use of sources, perspectives and interpretations, and explanation and communication. The three guiding inquiry questions are:

- How did the nature of global conflict change during the twentieth century?
- What were the consequences of World War II? How did these consequences shape the modern world?
- How was Australian society affected by other significant global events and changes in this period?

In Year 10, the AC: G provides a study of environmental change and management, and geographies of human wellbeing. The content is organised into two strands: *inquiry and skills* and *knowledge and understanding*. The *inquiry and skills* strand develops students' capacity in observing, questioning and planning, collecting, recording, evaluating and representing, interpreting, analysing and concluding, communicating, and reflecting and responding. The three guiding inquiry questions are:

- How can the spatial variation between places and changes in environments be explained?
- What management options exist for sustaining human and natural systems into the future?
- How do world views influence decisions on how to manage environmental and social change?

In Year 10, the AC: CC provides a study of Australia's system of government and its global connections. The content is organised into two strands: *skills* and *knowledge and understanding*. The *skills* strand develops students' capacity in questioning and research, analysis, research and interpretation, problem-solving and decision-making, and communication and reflection. The *knowledge and understanding* strand has three themes: government and democracy, law and citizens, and citizenship, diversity and identity. The three guiding inquiry questions are:

- How is Australia's democracy defined and shaped by the global context?
- How are government policies shaped by Australia's international legal obligations?
- What are the features of a resilient democracy?

In Year 10, the AC: EB provides a study of Australia’s economic performance and standard of living. The content is organised into two strands: *skills* and *knowledge and understanding*. The *skills* strand develops students’ capacity in questioning and research, interpretation and analysis, economic reasoning, decision-making and application, and communication and reflection. The four guiding inquiry questions are:

- How is the performance of an economy measured?
- Why do variations in economic performance in different economies exist?
- What strategies do governments use to manage economic performance?
- How do governments, businesses and individuals respond to changing economic conditions?

The expectations of the BCC: SS in Year 10 centre on the topic *Canada and the world: 1919 to the present*. The content is organised beneath four Big Ideas which guide the selection of content:

- Global and regional conflicts have been a powerful force in shaping our contemporary world and identities
- The development of political institutions is influenced by economic, social, ideological and geographic factors
- Worldviews lead to different perspectives and ideas about developments in Canadian society
- Historical and contemporary injustices challenge the narrative and identity of Canada as an inclusive, multicultural society.

The stated aim of the curriculum is to support both disciplinary and interdisciplinary learning, encourage locally developed curriculum, and enable a variety of learning environments (BCME, 2015c).

Both the AC: H and BCC: SS use similar concepts to underpin learning in Year 10/Grade 10. In AC: H, these are evidence, continuity and change, cause and effect, perspectives, empathy, significance and contestability. In BCC: SS, these are significance, evidence, continuity and change, cause and consequence, perspective, and ethical judgement.

Measurement of Curriculum: Breadth, Depth and Rigour

	BREADTH			DEPTH			RIGOUR		
	Limited	Fundamental	Comprehensive	Limited	Fundamental	Challenging	Limited	Moderate	Challenging
AC									
BCC									

AC – Breadth

Breadth: Comprehensive

For students in Year 10, the expectations of the AC as expressed through the combined agency of four subject areas are deemed to be **comprehensive** in relation to breadth of coverage. The concepts and skills of Australian Curriculum: History (AC: H), Australian Curriculum: Geography (AC: G), Australian Curriculum: Civics and Citizenship (AC: CC) and Australian Curriculum: Economics and Business (AC: EB) in Year 10 allow learners to build on the learning from each of these specific subject areas in Years 7, 8 and 9. Each subject has its own collection of overarching concepts, inquiry questions, inquiry skills, knowledge and understanding, with associated elaborations to support teaching and learning.

Table 3.27 *Number of content descriptions in AC: H, AC: G, AC: CC, AC: EB, Year 10*

Year 10	History	Geography	Civics and Citizenship	Economics and Business
General Capabilities	7	7	7	7
Cross-Curriculum Priorities	3	3	3	3
Inquiry questions	3	3	3	4
Content description: inquiry and skills	12	9	8	7
Elaborations	20	22	15	18
Content description: knowledge and understanding	21	11	8	5
Elaborations	32	35	14	21

BCC – Breadth

Breadth: Fundamental

For students in Grade 10, the expectations of the draft BCC: Social Studies (BCC: SS) are deemed to be **fundamental** in relation to breadth of coverage. The content and competencies of the BCC: SS in Grade 10 allow learners to build upon the sequence of experiences in Grades 7, 8 and 9. The BCC: SS is shaped by Big Ideas and concepts with a particular focus on Canada’s place in the world over the past one hundred years, supported by highly detailed elaborations that are not mandatory.

Table 3.28 *Number of content statements in BCC: SS, Grade 10*

Grade 10	Social Studies
Core Competencies	3
Big Ideas	4
Curricular Competencies	8
Elaborations	19
Content	10
Elaborations	51

AC – Depth

Depth: Fundamental

The expectations of the AC: HASS for Year 10 are regarded as **fundamental**, based on the details of knowledge and topics outlined in the curriculum. In Year 10, the AC: HASS expands to include four separate subject areas: History, Geography, Civics and Citizenship, and Economics and Business. Each has its own content descriptions (incorporating *skills* and *knowledge and understanding*) and associated elaborations to support teaching and learning. The depth to which learners should explore each content statement is indicated within its wording. Taken individually, each subject area has the potential to be challenging in its depth. Taken collectively as a subject, the coverage and mastery of its multiple components could be challenged by time constraints. The content descriptions primarily focus upon descriptions, explanations, interpretations and communication.

BCC – Depth

Depth: Fundamental

The expectations of the BCC: SS are rated as **fundamental**, based on the details of knowledge and topics demanded in the curriculum. Year 10 content in the BCC: SS is limited to ten areas associated with the topic *Canada and the World: 1919 to the present*. The depth to which learners may explore this topic is indicated through the various elaborations associated with each content point. These elaborations are sample topics and predominantly engage learners in the collection and exploration of specific information. The elaborations for the listed Curricular Competencies and content present a large number of extremely precise sample activities that allow teachers to design deep and challenging learning experiences through appropriate programming.

AC – Rigour

Rigour: Challenging

The cognitive demand placed on Year 10 students in each of the four subject areas that comprise the AC: HASS indicates a **challenging** degree of rigour. The directive terms and expectations of students visible throughout the content descriptions of the four subject areas are predominantly associated with acquisition and application. Across all four subject areas, the Year 10 achievement standards for the typical student are dominated by the terms *analyse, evaluate, apply* and *take action*.

BCC – Rigour

Rigour: Moderate

The cognitive demand placed upon Grade 10 students in the BCC: SS indicates a **moderate** degree of rigour. As is true of the AC, the content descriptions of the BCC: SS are predominantly associated with acquisition and application. The following terms dominate the focus of the Curricular Competences: *assess, compare, explain* and *infer*.

Comparative Analysis

The BCC: SS is a concept-based, competency-driven curriculum. The stated intention of the BCC: SS is to place a greater focus on depth than breadth, with increasing focus on historical and geographic thinking skills (BCME, 2016c). Criticism of previous versions of the Social Studies curriculum targeted the predominance of historical content and the use of *controlling* language to mandate the experiences of learners (Broom, 2015). The new Social Studies curriculum is designed to allow teachers and students to pursue directions of particular interest and local relevance by delving deeper into a smaller number of key topics (BCME, 2016c). The resultant depth, breath and rigour of student learning is, therefore, inevitably and closely linked to the quality of the programming and learning experiences in each individual classroom. To support the implementation of the curriculum, the British Columbia Ministry of Education has provided teachers with detailed Instructional Samples of programs, teaching activities and pedagogical research. It should also be noted that the British Columbia Ministry of Education does not allocate or mandate the amount of time devoted to any part of the Social Studies curriculum at any year level.

The BCC: SS presents the same basic content and structure of the previous version to integrate personal, regional, national and international histories and geographies, using

Hanna's *expanding communities* model of social studies education (Stallones, 2003). The BCC website also states that "the Ministry of Education defines the 'what' to teach but not the 'how' to organise the time, space or methods to teach it" (BC ME, 2016). However, across Kindergarten to Year 10, the Curricular Competencies for Social Studies are developmentally or hierarchically organised to align with Peter Seixas' six concepts of historical thinking: significance, evidence, continuity and change, cause and consequence, perspective and ethical judgement (1994).

The hierarchy present in the Curricular Competencies for BCC: SS, and their presence in the AC: HASS at the three comparison points, are demonstrated in the following table.

Table 3.29 Curriculum Competency comparison points for BCC: SS and AC: HASS

BCC: SS Grade 2	BCC: SS Grade 6	BCC: SS Grade 10
Significance (Listed as a key concept in the AC: HASS from Year 2 but without hierarchy or elaboration)		
Explain why people, events, or places are significant to various individuals and groups	Construct arguments defending the significance of individuals/groups, places, events or developments	Assess the significance of people, places, events, or developments and compare varying perspectives on their significance at particular times and places and from group to group
Evidence (Listed as a key concept in the AC: HASS from Year 2 as sources but without hierarchy or elaboration)		
Ask questions, make inferences and draw conclusions about the content and features of different types of sources	Ask questions, corroborate inferences, and draw conclusions about the content and origins of a variety of sources, including mass media	Assess the justification for competing accounts after investigating points of contention, reliability of sources, and adequacy of evidence
Continuity and change (Listed as a key concept in the AC: HASS from Year 2 but without hierarchy or elaboration)		
Sequence objects, images and events or explain why some aspects change and others stay the same	Sequence objects, images, or events and recognise the positive and negative aspects of continuities and changes in the past and present	Compare and contrast continuities and changes for different groups during this period
Cause and Consequence (Listed as a key concept in the AC: HASS from Year 2 as cause and effect but without hierarchy or elaboration)		
Recognise causes and consequences of events, decisions, or developments	Differentiate between short- and long-term causes, and intended and unintended consequences, of events, decisions or developments	Assess how prevailing conditions and the actions of individuals or groups influence events, decisions or developments
Perspective (Listed as a key concept in the AC: HASS from Year 2 but without hierarchy or elaboration)		
Explain why people's beliefs, values, worldviews, experiences and roles give them different perspectives on people, places, issues or events	Take stakeholders' perspectives on issues, developments for others locally or globally about their beliefs, values and motivations	Explain and infer different perspectives on past or present people, places, issues or events by considering prevailing norms, values, worldviews and beliefs
Ethical judgement (a General Capability in the Australian Curriculum from Foundation with a Learning Continuum)		
Make value judgements about events, decisions, or actions and suggest lessons that can be learned	Make ethical judgements about events, decisions or actions that consider the conditions of a particular place and time, and assess appropriate ways to respond	Recognise implicit and explicit ethical judgements in a variety of sources

The AC: HASS also draws upon Hanna's model to shape the sequence of topics from Foundation through to Year 6 to create an integrated exploration of personal, regional, national and international histories and geographies. In Years 7-10, the four integrated sub-strands are replaced by four separate subject areas: History, Geography, Civics and

Citizenship, and Economics and Business. Across all year levels, the targeted inquiry skills are organised developmentally or hierarchically and according to processes rather than concepts: questioning, researching, analysing, evaluating and reflecting, and communicating for Foundation to Year 6, with subject-specific skills in Year 7-10 for each of History, Geography, Civics and Citizenship, and Economics and Business. Historical concepts similar to those used in British Columbia are provided in the overview statements, without elaboration or explanation. Additional specific concepts for Geography, Civics and Citizenship, and Economics and Business are provided within each sub-strand or subject area. The possible amount of time allocated to the delivery of each sub-strand or subject area is indicated in the notional advice given to the curriculum writers:

- Year 2: 4% of time (2% History, 2% Geography)
- Year 6: 12% of time (4% History, 4% Geography, 2% Civics and Citizenship, 2% Economics and Business)
- Year 10: 17% of time (5% History, 5% Geography, 2% Civics and Citizenship, 5% Economics and Business). (ACARA, 2013)

This curricular design contrasts with the BCC: SS which imposes no temporal parameters upon either the writing or delivery of its curriculum. The presence or absence of these parameters consequently impacts upon any judgement of breadth, depth and rigour regarding the content and expectations of the AC: HASS and the BCC: SS.

A tabular summary of the number of Content Descriptions (including Elaborations) of the AC: HASS and the BCC: SS is provided as a visual guide to the details:

Table 3.30 A visual presentation of the content descriptions of AC: HASS and BCC: SS

Year 2/Grade 2	Australian Curriculum				British Columbia Curriculum
	Humanities and Social Sciences				Social Studies
General Capabilities/Core Competencies	7				3
Cross-Curriculum Priorities	3				-
Inquiry questions/Big Ideas	3				3
Skills/Curricular competencies	10				7
Elaborations	35				29
	History	Geography		Social Studies	
Key concepts	5	4		-	
Inquiry questions	3	3		-	
Knowledge/Content	3	5		6	
Elaborations	11	14		26	
Year 6/Grade 6	Australian Curriculum				British Columbia Curriculum
	Humanities and Social Sciences				Social Studies
General Capabilities/Core Competencies	7				3
Cross-Curricular Priorities	3				-
Inquiry questions/Big Ideas	3				4
Skills/Curricular competencies	12				8
Elaborations	54				22
	H	G	CC	EB	Social Studies
Key concepts	6	5	3	4	-
Inquiry questions	4	3	3	3	-
Knowledge/Content	4	4	6	3	9
Elaborations	17	13	19	10	67
Year 10/Grade 10	Australian Curriculum				British Columbia Curriculum
	H	G	CC	EB	Social Studies
General Capabilities/Core Competencies	7	7	7	7	3
Cross-Curricular Priorities	3	3	3	3	-
Inquiry questions/Big Ideas	3	3	3	4	4
Skills/Core curricular	12	9	8	7	8
Elaborations	20	22	15	18	19
	H	G	CC	EB	Social Studies
Knowledge/Content	21	11	8	5	10
Elaborations	32	35	14	21	51

The table presents a quantitative indication that in Year 2 the AC: HASS and the BCC: SS are largely comparable in terms of depth and breadth. Divergence is apparent at Year 6, with the inclusion of four sub-strands within the AC: HASS (History, Geography, Civics and Citizenship, and Economics and Business), each of which, although integrated, has its own content requirements. The BCC: SS limits the number of content areas but greatly expands the number of possible elaborations that can be used to guide teaching and learning. It should be noted that while the AC: HASS has far more content in Foundation – Year 6 than in the BCC: SS, the targeted skills are, in the main, developmentally comparable.

This contrasting pattern of breadth versus depth is replicated in Year 10, with four discrete subject areas (History, Geography, Civics and Citizenship, and Economics and Business) in the AC, each with its own skills, knowledge and understanding requirements. At the same year level, the BCC: SS offers a comparatively narrow content focus while allowing for deeper exploration through its increased number of elaborations.

A year-by-year comparison of the topics for each year in the AC: HASS and the BCC: SS is shown in the following table.

Table 3.31 *Topic comparisons for AC: HASS & BCC: SS, Foundation/Kindergarten to Year/Grade 10*

Year	Australian Curriculum	British Columbia Curriculum
Foundation/ Kindergarten	<i>HASS: My Personal World</i>	SS: Identity and Families
Year 1/Grade 1	<i>HASS: How My World is Different From the Past and Can Change in the Future</i>	SS: Local Communities
Year 2/Grade 2	<i>HASS: Our Past and Present Connections to People and Places</i>	SS: Regional and Global Communities
Year 3/Grade 3	<i>HASS: Diverse Communities and Places and the Contribution People Make</i>	SS: Global Indigenous Peoples
Year 4/Grade 4	<i>HASS: How People, Places and Environments Interact, Past and Present</i>	SS: First Peoples and European Contact
Year 5/Grade 5	<i>HASS: Australian Communities – Their Past, Present and Possible Futures</i>	SS: Canadian Issues and Governance
Year 6/Grade 6	<i>HASS: Australia in the Past and Present and Its Connection with a Diverse World</i>	SS: Global Issues and Governance
Year 7/Grade 7	<i>H: The Ancient World</i> <i>G: Water in the World; Place and Liveability</i> <i>CC</i> <i>EB</i>	SS: The Ancient World
Year 8/Grade 8	<i>H: The Ancient to the Modern World</i> <i>G: Landforms and Landscapes; Changing nations</i> <i>CC</i> <i>EB</i>	SS: 7 th century to 1750
Year 9/Grade 9	<i>H: The Making of the Modern World</i> <i>G: Biomes and Food Security; Geographies of Interconnections</i> <i>CC</i> <i>EB</i>	SS: 1750–1919
Year 10/ Grade 10	<i>H: The Modern World and Australia</i> <i>G: Environmental Change and Management; Geographies of Human Wellbeing</i> <i>CC</i> <i>EB</i>	SS: Canada and the World: 1919 to the present

The conclusions drawn from this comparative analysis of the AC: HASS and the BCC: SS are that:

- both provide frameworks for teaching and learning that are developmentally and culturally appropriate
- the breadth of the AC: HASS expands over time, with the inclusion of an increased number of sub-strands in Year 6 and four discrete subject areas in Year 10, and this may impact upon the depth with which the curriculum is implemented in schools or classrooms
- the breadth of the BCC: SS is relatively narrow and unchanging in order to allow for the study of topics in greater depth
- the AC: HASS provides details of student performance expectations via the achievement standards for each sub-strand and subject
- the BCC: SS provides no guidance on or details about student performance expectations
- both frameworks rely on the programming of individual teachers, schools or districts to fulfil their potential for student engagement and rigour in their learning.

e) The Arts

Comparative Curricula

Australian Curriculum: The Arts: Dance
Australian Curriculum: The Arts: Drama
Australian Curriculum: The Arts: Media Arts
Australian Curriculum: The Arts: Music
Australian Curriculum: The Arts: Visual Arts
British Columbia Curriculum: Arts Education

Year/Grade Level

Australian Curriculum: Year 2
British Columbia Curriculum: Grade 2

Learning Area/Subject

Australian Curriculum: The Arts (AC: TA)
British Columbia Curriculum: Arts Education (BCC: AE)

Expectations: Knowledge and Skills

The AC: TA expects students to have developed discipline-based knowledge, understanding and skills in the arts by the age of seven. The two interrelated arts strands of *making* and *responding* apply to five arts subjects (Dance, Drama, Media Arts, Music, and Visual Arts). Within these subjects, there are highly specific practices, knowledge and skills, unique to each discipline. Building on earlier experiences, students develop the ability to describe, respond and represent ideas across all artworks and/or the discrete arts subjects being programmed in a school setting. *Purposeful and creative play in structured activities* distinguishes Year 2 learning. Fundamental technical skills are clearly identified and described and form part of an increasingly sophisticated mastery in each discipline. Composing, creating and expressing are key ideas across the five subjects, leading to a variety of artworks. Imaginative and critical thinking informs students' own practice, enabling them to explore and construct critical responses to the work of others.

The BCC: AE at Grade 2 is a single, generic learning area that identifies Dance, Drama, Music, and Visual Arts as the vehicles for teaching and learning. Seven-year-old students are expected to use creative processes to *explore and create, reason and reflect, and communicate and document*. In this curriculum, each discipline is regarded as *unique and of equal importance*; no explicit subject-specific practices, knowledge and skills are identified. It is acknowledged that each subject has a *unique language* (Grade 2 - Big Idea). Some discipline-specific elements and definitions are provided. Students continue their personal journey founded on the declared philosophical approach: *artistic habits of mind*. Students in Grade 2 are encouraged to explore, reflect and communicate across the four arts subjects. Creative risk taking is encouraged through exploratory and inquiry-based learning, both collaboratively and individually.

In the AC: TA and the BCC: AE the role of purposeful play at this year/grade is made explicit. Artworks as products and processes are more explicit in AC: TA. Art forms are identified in the BCC: AE with the use of the elaborations. There is parity between the two major strands of *making* and *responding* in the AC: TA and the repertoire of *Curricular Competencies* in the BCC: AE.

Measurement of Curriculum: Breadth, Depth and Rigour

	BREADTH			DEPTH			RIGOUR		
	Limited	Fundamental	Comprehensive	Limited	Fundamental	Challenging	Limited	Moderate	Challenging
AC									
BCC									

AC – Breadth

Breadth: Comprehensive

For Year 2 students, the AC: TA builds upon a sequence of learning that is designed to engage students with all five subjects. Each subject offers an authentic, discipline-specific arts experience that reflects the particular knowledge and learning in that field. In Dance, there are 22 content descriptions organised across four key focus areas. Drama has 19 content descriptions organised across four key focus areas. In Media Arts, there are 21 content descriptions across four key focus areas and Music has 22 content descriptions across four key focus areas. In Visual Arts, 18 content descriptions are provided across four key focus areas. This represents **comprehensive** coverage stretching across highly specific descriptions, peculiar to each discipline.

Table 3.32 *Number of content descriptions in AC: TA, Year 2*

Year 2	The Arts				
Strands (making and responding)	2				
Sub-strands	4				
Content description: inquiry and skills	20				
Elaborations	102				
Year 2	Dance	Drama	Media Arts	Music	Visual Arts
Sub-strands	4	4	4	4	4
Content descriptions	4	4	4	4	4
Elaborations	22	19	21	22	18

BCC – Breadth

Breadth: Fundamental

The BCC: AE at Year 2 presents four Big Ideas with eleven content descriptions organised around three key focus areas: Exploring and Creating, Reasoning and Reflecting, Communicating and Documenting. While the breadth is considerably less than the AC: TA, there is a **fundamental** offering through a broad range of concepts, coverage and the opportunity to make and respond to artworks.

Table 3.33 Number of content descriptions in BCC: AE, Grade 2

Grade 2	Arts Education
Big Ideas	4
Elaborations	2
Curricular competencies	11
Elaborations	7
Content	8
Elaborations	32

AC – Depth

Depth: Challenging

For Year 2 students, the AC: TA is regarded as **challenging** as it encompasses a set of five discrete subjects, each with its own particular content descriptions, knowledge and skills. At times these are linked, even at this early learning stage, to authentic professional practices in the real world. An example is the requirement to *explore role and dramatic action in dramatic play, improvisation and process drama*. The range of distinctive content descriptions for each subject area with appropriate achievement standards is challenging. The working definition being deployed for this analysis supports that depth is deemed challenging if it demonstrates a considerable level of detail about a body of knowledge or topic. The AC: TA challenges Year 2 students by delivering the curriculum across five discrete subjects, characterised by learning that integrates, interconnects and offers a composite of knowledge requiring higher-order thinking.

BCC – Depth

Depth: Limited

The BCC: AE for Year 2 is deemed to be **limited** in relation to depth of coverage. It asks that students be exposed to elements of Dance, Drama, Music and Visual Arts using the same suite of curricular competencies and content. There is minimal subject differentiation; for example, artist is a generic term that might refer to a dancer, musician or actor. While one of the Big Ideas notes that Dance, drama, music, and visual arts are each unique languages for creating and communicating, teachers are not provided with any detailed, unique competencies or content drivers to support this overarching outcome. It is assumed then, that teachers will invest professional time in order to understand the unique language of each subject. It can also be assumed that some educators will maximise the inherent opportunities that exist in the very flexible BCC: AE in order to encourage deeper learning among their students. However, the process and guidance that enable this are not immediately evident in the curriculum.

AC – Rigour

Rigour: Challenging

The **challenging** standard of rigour in the AC: TA is evident in several key ways. The five subjects present teachers and students with highly specific, discipline-based knowledge and skills. At Year 2, students are building upon foundational experiences that are unique to learning in and across The Arts. Technical language and authentic processes, unique to

each subject, are deployed and used by teachers and students to deepen thinking and learning.

BCC – Rigour

Rigour: Moderate

Documents specific to the BCC: AE such as Introduction, Goals and Rationale and What's New all note that the Arts Education curriculum is designed to be flexible so that teachers can decide whether an integrated or subject-specific approach would best suit their students. The level of rigour may vary from classroom to classroom, given the variance of educator interpretation, translation and delivery. Consequently, the level of rigour is deemed to be **moderate**.

Comparative Analysis

Table 3.34 Comparison of content descriptions in AC: TA, Year 2 and BCC: AE, Grade 2

Year 2 / Grade 2	Australian Curriculum					British Columbia Curriculum
	The Arts					Arts Education
General Capabilities/Core Competencies	7					3
Cross-Curricular Priorities	3					2
Inquiry questions/Big Ideas	0					4
	DA	DR	MA	MU	VA	Arts Education
Key concepts/Sub-strands	4	4	4	4	4	4
Knowledge/Content	4	4	4	4	4	11
Elaborations	22	19	21	22	4	32

In Year 2 / Grade 2 the key differentiating element between AC: TA and BCC: AE is the AC: TA offering of five discrete subjects contrasted with an integrated Arts Education in British Columbia. BCC: AE Dance, Drama, Music and Visual Arts as the four Arts subjects through which students will explore and develop artistic and creative processes. These can be offered as unique subjects or as integrated, inter-disciplinary learning experiences.

In BCC: AE, the four Big Ideas at Grade 2 focus on *creative inquiry* and *art as communication (across time and place)*. The more detailed AC: TA asks Year 2 students to engage with sophisticated perspectives, including:

- student as *artist-communicator*
- student as *artist-technician*
- student as *artist-performer*
- student as *audience-responder-consumer*.

These perspectives reflect the description of how students learn in the Arts outlined in *Shape of the Australian Curriculum: The Arts* (ACARA, 2010) that "Students learn as *artists*, by

making art works that communicate to audiences. They learn as *audiences*, by *responding* critically to the Arts. These actions are taught together as each depends on the other”.

Agency is ascribed to each of the viewpoints and shapes the type of inquiry and activity deployed by the student. In Year 2, for example, students:

- describe the effect of elements of dance they make, perform and view and where and why people dance
- use the elements of dance to make and perform sequences that demonstrate fundamental movement skills to represent ideas
- describe what happens in drama they make, perform and view
- identify elements in drama and describe where and why there is drama
- make and present drama using the elements of role, situation and focus in dramatic play and improvisation
- communicate about media artworks they make and view, and where and why media artworks are made
- make and share media artworks using story principles, composition, sound and technologies
- communicate about music they listen to, make and perform and where and why people make music
- improvise, compose, arrange and perform music
- demonstrate aural skills by staying in tune and keeping in time when they sing and play
- describe artworks they make and view and where and why artworks are made and presented
- make artworks in different forms to express their ideas, observations and imagination, using different techniques and processes.

Given the developmental stage of the students, this represents comprehensive breadth and a challenging level of depth and rigour.

The BCC: AE program at Grade 2 is informed by artful habits of mind (Harvard Graduate School of Education, 2006, Costa and Kallick, 2000). This diverts the focus from specific and explicit content to transferable creative thinking processes that students can apply to all aspects of their learning within and outside the Arts Education curriculum. The Grade 2 student is expected to *explore and create, reason and reflect, and communicate and document* in order to attain a fundamental suite of knowledge and understanding in the arts.

Teachers are encouraged to program deep learning around the conceptual principles, Big Ideas and curricular competencies. The curriculum instrument itself is not strong in terms of depth, meaning that the potential for deeper learning relies very much on the interests and abilities of teachers to program for this outcome.

In summary, the following comparisons can be drawn:

- both curricula provide developmentally appropriate arts learning for Year 2/Grade 2 students
- the AC: TA is a comprehensive and highly prescriptive instrument, arranged by discipline, which specifies unique knowledge and skills in each subject
- the BCC: AE is a concept-based, competency-driven instrument, inspired by transferable creative competencies

- the BCC: AE relies on teacher engagement to bring depth to Arts Education learning. The expected depth of learning is explicit and evident in the AC: TA.

Year/Grade Level

Australian Curriculum: Year 6

British Columbia Curriculum: Grade 6

Learning Area/Subject

Australian Curriculum: The Arts (AC: TA)

British Columbia Curriculum: Arts Education (BCC: AE)

Expectations: Knowledge and Skills – Content AC: Achievement Standards BCC: Curricular Competencies

The AC: TA expects Year 6 students to have developed a sophisticated set of knowledge and skills across all of the subjects that make up this learning area. In some settings, one or more of the subjects may have been delivered in more detail, this being highly dependent on a school's access to teachers with the requisite expertise. In part, this subject specialisation prepares students for the further faculty specialisation that occurs in Year 7 and in the later years of schooling, appreciating that each subject has discipline-based technical, performance and responding outcomes. The term *intention* is a key differentiator at this learning stage. By the end of Year 6, students are expected to be able to articulate and communicate creative intentions via the various performative opportunities embedded in the arts. Intention is a significant feature of this learning area as it demands that students embed meaning in their creative products and performances. This meaning can be described, explained, justified, and is connected to real-world artistic influences or references.

The BCC: AE at Grade 6 is a conceptual framework that provides teachers and students with significant opportunity to apply creative processes to any number of possible studio activities. *Purposeful play* is included alongside *ideas inspired by imagination, inquiry, and experimentation* as the particular means by which Grade 6 students explore and create. There is a focus on engaging with art forms to better understand the emotional, psychological and cultural viewpoints of oneself and of others. This is developmentally appropriate, given the characteristics of the pre-adolescent stage and interest in the emerging self and the wider world.

Both curricula make explicit references to *intentionality* as a defining characteristic of this stage of learning. This is a powerful term as it ascribes creative agency to the student and makes them accountable for choices and decisions throughout the creative process, across all arts subjects; it also reflects the broader commitment of the BCC to encouraging student agency and engagement in all learning areas. The BCC invites Grade 6 students to *explore and create, reason and reflect, and communicate and document*. It is a generic framework that is deployed regardless of the specific subject being taught. The AC, on the other hand, offers highly specific subject-specific content.

Measurement of Curriculum: Breadth, Depth, and Rigour

	BREADTH			DEPTH			RIGOUR		
	Limited	Fundamental	Comprehensive	Limited	Fundamental	Challenging	Limited	Moderate	Challenging
AC									
BCC									

AC – Breadth

Breadth: Comprehensive

The AC: TA at Year 6 builds upon a sequence of learning that is designed to engage students with all five subjects. Each subject offers an authentic, discipline-specific arts experience that reflects the knowledge and learning expected in that field. On this basis, the expected breadth of learning is deemed to be **comprehensive**. Dance has 22 content descriptions organised across four key focus areas; Drama has 26 content descriptions organised across four key focus areas; Media Arts has 21 content descriptions across four key focus areas; Music has 21 content descriptions across four key focus areas; and Visual Arts has 25 content descriptions across four key focus areas.

Table 3.35 *Content statements in AC: TA, Year 6*

Year 6	The Arts				
Strands (making and responding)	2				
Sub-strands	4				
Content description: inquiry and skills	20				
Elaborations	115				
Year 6	Dance	Drama	Media Arts	Music	Visual Arts
Key concepts	4	4	4	4	4
Content descriptions	4	4	4	4	4
Elaborations	22	26	21	21	25

BCC – Breadth

Breadth: Fundamental

For Grade 6 students, the BCC: AE describes four Big Ideas with sixteen content descriptions organised around three key focus areas: Exploring and Creating, Reasoning and Reflecting, Communicating and Documenting. There is great flexibility for teachers to work with students to pursue their interests and passions, but on the basis of breadth of coverage, the expected learning is evaluated as **fundamental**.

Table 3.36 *Content statements in BCC: AE, Grade 6*

Grade 6	Arts Education
Big Ideas	4
Elaborations	2
Curricular Competencies	16
Elaborations	11
Content	10
Elaborations	37

AC – Depth

Depth: Challenging

The AC: TA at Year 6 is a keystone destination as it marks the end of what should be a broad range of arts education experiences to inform an emerging specialty in secondary school. The curriculum is designed to provide for an authentic range of experiences across all five subjects with a degree of specialisation in at least two arts subjects. On this basis, the expected depth of learning is assessed as **challenging**. Specialisation is context-specific and will reflect the school community’s interests, cultural diversity and resources.

These types of performances are sophisticated and cognitively demanding activities. Students are expected to conceive, plan, experiment, interpret and synthesise personal interpretations of their world with others. Some examples of extended thinking evident across the AC: TA include: (ACAVAR117) *Explain how visual arts conventions communicate meaning by comparing artworks from different social, cultural and historical contexts, including Aboriginal and Torres Strait Islander artworks;* (ACAMUR090) *Rehearse and perform music including music they have composed by improvising, sourcing and arranging ideas and making decisions to engage an audience;* and (ACADAM011) *Perform dance using expressive skills to communicate a choreographer’s ideas, including performing dances of cultural groups in the community.*

BCC – Depth

Depth: Fundamental

The BCC: AE makes provision for highly flexible opportunities, developed by teachers, which meet the needs and interests of their students. The **fundamental** expectations in relation to depth are evident in the generic nature of the Curricular Competencies. These have been carefully crafted for adaptation to any of the four arts subjects (Dance, Drama, Music, Visual Arts) but this results in less evidence of discipline-specific depth. There is evidence of a range of cognitive demands that will develop reproduction skills and strategic thinking and offer a set of essential competencies that can be applied to any arts activity planned by the teacher.

AC – Rigour

Rigour: Challenging

By the end of primary schooling, students have accumulated a range of specialised arts learning. In the best of circumstances, they will have undertaken deep learning in several arts subjects, as well as having had some introduction to others so that differentiation by discipline is evident to students (for example, language, processes, materials, practices).

The detailed expectations, as set out in the curriculum, present significant challenges for teachers and students as far as product delivery is concerned. Students are expected to create, innovate, cross-reference and ‘pollinate’. They are encouraged to integrate and deploy multiple, simultaneous skills in order to meet the various demands for conceiving and composing original works that reflect their ideas and viewpoints about the world. On this basis, the level of rigour is deemed to be **challenging**.

BCC – Rigour

Rigour: Moderate

While the potential for myriad extended interpretations is evident, at this stage of learning the BCC: AE is characterised by **moderate** expectations of rigour. There is considerable flexibility for students to develop skills in expressing themselves using creative practices, but these are not necessarily complex or cognitively challenging, as the demonstration and development of artistic methods does not presume sustained deep learning experiences or the acquisition of problem-solving skills.

Comparative Analysis

Table 3.37 Comparison of content descriptions in AC: TA, Year 6 and BCC: AE, Grade 6

Year 6/Grade 6	Australian Curriculum					British Columbia Curriculum
	The Arts					Arts Education
General Capabilities/Core Competencies	7					3
Cross-Curricular Priorities	3					2
Inquiry questions/Big Ideas	0					4
	DA	DR	MA	MU	VA	Arts Education
Key concepts/Sub-strands	4	4	4	4	4	4
Knowledge/Content	4	4	4	4	4	16
Elaborations	22	26	21	21	25	37

In Year 6/Grade 6, the key differentiating element between AC: TA and BCC: AE remains the extent of subject-specific differentiation in the classroom. The BCC: AE dedicates one of four Big Ideas to explaining that *dance, drama, music, and visual arts are each unique languages for creating and communicating*. However, subject-specific language (definitions, discipline-specific performance) is only available through the content elaborations. The three key curricular competencies of *Exploring and creating, Reasoning and reflecting, and Communicating and documenting*, provide teachers with highly flexible opportunities to plan and program for a vast range of *arts* learning.

The five subjects in the AC: TA are detailed undertakings that reflect discipline-specific specialisation. Students are expected to explain and account for creative intentions in their artmaking across Dance (choreography), Drama (acting, playwriting), Media Arts (media artworks), Music (perform, compose), and Visual Arts (artworks). This accountability makes significant cognitive demands as students are asked to deploy and demonstrate the technical knowledge, understanding and skills relevant to the practice of The Arts subject. This is quite different from the concept-based BCC: AE Grade 6 offering wherein generic

habits of mind are applied to the particular arts activity designed and selected by the teacher and are then adapted for purpose and context.

Students in Year 6/Grade 6, regardless of location, are encouraged to use artmaking to build understandings of self and the wider world. In British Columbia, this is represented in two of the four Big Ideas, written as *Engaging in creative expression and experiences expands people's sense of identity and community* and *Experiencing art is a means to develop empathy for others' perspectives and experiences*. In the AC: TA there are multiple references, across the five subjects, to making connections with practices from different social, historical and cultural contexts. This is a highly appropriate demand given the developmental age and stage of students. In addition, the AC: TA reinforces the authenticity of the *student as artist* by expecting them to express themselves and communicate their views and ideas through a variety of performances. The BCC: AE also emphasises the legitimacy of the *student as artist* but makes less provision for the demonstration of unique, subject-specific qualities across the various art forms.

The AC: TA's breadth, depth and rigour are demonstrated through the sophisticated suite of content descriptions assigned to each subject. Improvising, creating, refining, performing, reflecting and manipulating are key performative behaviours that Year 6 students enact with increasing mastery of technical processes, techniques and materials. As examples, the following specifications are complex and demanding for twelve-year old students: *Plan, produce and present media artworks for specific audiences and purposes using responsible media practices* (ACAMAM064) and *Rehearse and perform music including music they have composed by improvising, sourcing and arranging ideas and making decisions to engage an audience* (ACAMUM090).

Purposeful play is one of several recommended creative approaches in BCC: AE at Grade 6. While purposeful play is acknowledged in the AC: F–2 materials, it no longer features by the end of primary school.

In summary, the following comparisons can be drawn:

- The AC: TA offers a highly prescribed and detailed suite of knowledge, understandings and skills at Year 6 across five subjects. The BCC: AE offers a highly flexible and generic arts experience that is constructed around a framework of transferable skills.
- Both curricula introduce the idea of intentionality at this stage/age. This is a critical concept at this stage as it expects students to be accountable for their creative choices and decisions. It reflects a maturational and intellectual milestone and legitimises the *student as artist*.
- Purposeful play, a concept usually associated with earlier primary learning, remains in the BCC: AE document. The AC: TA accelerates the expectations of performance-based behaviours and has removed any reference to purposeful play by this late primary stage.

Year/Grade Level

Australian Curriculum: Year 10

British Columbia Curriculum: Grade 10

Learning Area/Subject

Australian Curriculum: The Arts (AC: TA) Five Subjects

British Columbia Curriculum: Arts Education (BCC: AE) Sixteen Subjects

Expectations: Knowledge and Skills – Content AC: Achievement Standards BCC: Curricular Competencies

The AC: TA at Year 10 marks the end-point of the continuum of learning from Foundation; at this stage, the five subjects that characterise learning in The Arts in F–6 are no longer mandatory. The elective nature of arts learning from Year 7–10 differs according to jurisdiction and school, with local decisions being made about how students in Years 7 and 8 access The Arts curriculum. In British Columbia, the generic Arts Education curriculum ceases at Grade 9, whereupon students may choose from a large number of highly specialised subjects (16) that can be studied in Grades 10–12. The BCC: AE Grades 10-12 currently exists in draft form only.

By Year 10, Australian students can elect to pursue the study of one or more of the five arts subjects. These subjects build upon the strands and sub-strands as set from Foundation onwards. The five arts subjects are highly specialised and informed by professional practices in the community, and the level of rigour prepares students for the demands of studying arts subjects as part of a senior secondary credential. There is increased demand and expectation for independent creative outcomes; students should have developed some mastery in the subject-specific techniques, processes and material manipulation by this stage to enable the development of a creative practice that can represent their ideas and viewpoints. This emerging practice is informed by cumulative knowledge and understanding of the other artists' intentions and practice, genres and styles, across time and place.

The BCC: AE at Grade 10 expands to offer students a suite of highly specific subjects that reflect the professional differentiation of each practice in the community. For example, Dance is offered as *Dance Choreography*, *Dance Company*, *Dance Foundations*, and/or *Dance Technique and Performance*. The concept-based, generic framework found in K–9 remains in place: *Exploring and creating*, *Reasoning and reflecting*, and *Communicating and documenting*. An additional content competency is included in the Grade 10 subjects: *Connecting and expanding*. This expansion of options reflects the broader British Columbia goal of a renewed curriculum that appeals to the passions and interests of young people. Specialised subject choices reflect the professional and real-world possibilities within each of The Arts subjects. This is strongly contrasted to the AC subject equivalent where Dance, for example, has a sampling of all elements of this discipline built into the single subject.

At the conclusion of AC: TA for Year 10, students are well prepared to undertake further specialised learning. Higher-order cognitive demands are required to create artworks across the subjects that are meaningful, reflective and demonstrate mastery of technical skill and professional practices. The Grade 10 student learning in British Columbia is equally well served by a set of highly specific arts subjects that address aspects of professional practice in the community. This offers real-world applicability, appeals to students' passions and interests and places high value on deep learning.

Measurement of Curriculum: Breadth, Depth and Rigour

	BREADTH			DEPTH			RIGOUR		
	Limited	Fundamental	Comprehensive	Limited	Fundamental	Challenging	Limited	Moderate	Challenging
AC									
BCC									

AC – Breadth

Breadth: Comprehensive

The breadth of The Arts offering in the AC: TA is regarded as **comprehensive** because it represents sustained, discipline-based learning opportunities for students in a range of specialised subjects. While this learning area is no longer mandatory at this stage of schooling, students who pursue one or more of The Arts subjects are given significant scope across the subject through a significant number of knowledge, understandings and skills that are woven into the making and responding strands.

Table 3.38 *Content statements in AC: TA - Dance, Drama, Media Arts, Music, Visual Arts, Year 10*

Year 10	Dance	Drama	Media Arts	Music	Visual Arts
Sub-strands	7	7	7	7	7
Content descriptions	7	7	7	7	7
General Capabilities	7	7	7	7	7
Cross-Curriculum Priorities	3	3	3	3	3
Elaborations	38	31	33	36	38

BCC – Breadth

Breadth: Comprehensive

In the BCC: AE, the content and competencies of the draft Grade 10 subjects are **comprehensive** in their breadth. An impressive range of curricular competencies, content and elaborations support the granularity of the subject. Big Ideas continue to provide conceptual guidance and demonstrate the degree of breadth in each of the subjects.

Table 3.39 Content statements in BCC: AE - Dance, Drama, Music, Visual Arts, Grade 10

Grade 10	DANCE				DRAMA		
Subjects	Choreography	Company	Foundations	Technique and Performance	Drama	Theatre company	Theatre production
Big Ideas	5	4	5	5	5	4	5
Curricular Competencies	23	28	31	25	26	30	25
Elaborations	4	5	13	5	10	8	5
Content	16	19	17	20	10	15	17
Elaborations	12	9	12	9	2	2	9

Grade 10	MUSIC			VISUAL ARTS			
Subjects	Choral	Contemporary	Instrumental	Art Studio	Sculpture	Drawing and Painting	Photography
Big Ideas	5	5	5	5	5	5	5
Curricular Competencies	28	30	29	24	25	25	27
Elaborations	9	9	10	6	7	6	8
Content	12	13	12	13	16	13	17
Elaborations	6	2	11	3	6	6	10

NOTE: Musical Theatre and Media Arts are offered as Cross-disciplinary and Inter-disciplinary Arts Courses. Media Design in BCC is offered as a is offered through the Applied Design, Skills and Technologies curriculum. Both Media Arts and Media Design draw on content that is included in AC: Media Arts although Media Design has more in common with AC: Design and Technologies

AC – Depth

Depth: Challenging

In the AC: TA at the conclusion of Year 10, students are expected to have attained deep learning in The Arts subject(s) of their choosing. The Band Descriptions are explicit for each subject and indicate the **challenging** level of depth across the making and responding strands.

BCC – Depth

Depth: Challenging

At this point, the BCC: AE Grade 10 students truly begin to hone their passions and interests in the arts. This is facilitated with the offering of 16 subjects at this grade level. The subjects are continued through Grades 11 and 12. At this grade level the opportunity for deep learning is evident in the detailed Curricular Competencies that are constructed for each of the highly specialised subjects on offer. On this basis, the expected depth of learning is deemed to be **challenging**.

AC – Rigour

Rigour: Challenging

In the AC: TA, the **challenging** level of rigour is evident in all five arts subjects offered to Year 10 students. Previous tables and sections reveal the breadth and depth of the various course structures as well as the rigorous expectations are identifiable in the multiple higher-order processes and products that are expected of an arts student in this year group. Examples include: Dance: *responding to feedback and using self-evaluation to vary and modify motifs, structure and form*; Drama: *analysing and creating performance highlighting subtext, dramatic tension, atmosphere and mood based on the story, setting, dialogue and stage directions*; Media Arts: *Deconstructing film or television work that includes representation of Aboriginal and Torres Strait Islander Peoples*; Music: *Evaluate a range of music and compositions to inform and refine their own compositions*; Visual Arts: *Plan and design artworks that represent artistic intention*.

BCC – Rigour

Rigour: Challenging

The BCC: AE's **challenging** level of rigour is evident in all of the sixteen subjects offered in Grade 10. Table 3.39 reveals the breadth and depth of the various course structures. Rigour is identified in the range of higher-order processes and products that are expected of an arts student at this grade level. Examples include: Dance: *Use critical-thinking and problem-solving skills to expand movement vocabulary*; Drama: *Apply critical, creative, and reflective thinking skills in the exploration, design, creation, and refinement of performances*; Music: *Demonstrate creative thinking and innovation by using ideas inspired by improvisation*; Visual Arts: *Evaluate design choices in artistic works*.

Comparative Analysis

Table 3.40 *Comparison of subjects, General Capabilities/Core Competencies and Cross-Curricular Priorities in AC: TA, Year 10 and BCC: AE, Grade 10*

Year 10/Grade 10	Australian Curriculum	British Columbia Curriculum
	The Arts	Arts Education
Number of subjects	5	16
General Capabilities/Core Competencies	7	3
Cross-Curricular Priorities	3	2

The AC: TA Year 10/BCC: AE Grade 10 student has access to authentic studio practices that are designed to mirror the professional world. Both curricula attempt to differentiate between *practical* and *theoretical* concerns in the respective subjects. This is reflected in the making and responding strands in the AC: TA and is appropriately woven into the four Curricular Competencies in the BCC: AE.

It is important to consider the change in provision from Grade 10 in British Columbia noting that Year 10 is the beginning of High School in Canada. The years K–9 describe a generic, integrated Arts framework with little mandated subject-specific differentiation, and the onus is

on school settings and teachers to design programs that articulate and demarcate disciplinary knowledge, understanding and skills to enable distinct learning in those subjects. This is a clear reflection of British Columbia's approach to curriculum design in which teachers are presented with a highly flexible model around which they can program contextually appropriate teaching and learning experiences befitting their students' interests and passions.

At the Year 10/Grade 10 stage, both curricula make considerable, higher-order demands on students. Students consider, evaluate, experiment, create, edit, refine and re-create to produce sophisticated original art products that reflect their ideas and viewpoints. This incorporates consolidated theoretical knowledge of artists and their work. The performative expectation embedded in all The Arts subjects carries a metacognitive imperative. Students are expected to consider and deliver art products to audiences: choreographed dances, dramatic renditions, mediated time-based works, musical compositions, two, three and four-dimensional art works. Embedded in this critical performative component are the dual notions of intention and practice. At the Year 10/Grade 10 stage, it is expected that students can articulate their creative voice both as *student-artists* and *audience*. In other words, the dual role of creative producer and reflective consumer is omnipresent in both the AC: AT and BCC: AE.

Making and creating are located at the centre both of Australian and British Columbia curricula at this stage. By Year 10/Grade 10, there is an increasing expectation that students are developing their own practice (voice, expression, reflective practices, interpretive process). Personal aesthetics, exploring one's identity and sense of belonging, developing individual focus, and learning to take intelligent creative risks are terms and expectations that characterise both the AC: TA and BCC: AE documents at this stage/level.

In summary, the following comparison can be drawn:

- The BCC: AE at this grade/stage becomes expansive in its breadth, depth and rigour by offering 16 subjects that provide for deep learning in specific aspects of the arts disciplines. For example, in the AC: TA, Drama is the single choice at this stage/year, whereas British Columbia's students can choose from Drama, Theatre Company, Theatre Production and Musical Theatre.
- The BCC: AE Grade 10 courses add an additional Curricular Competency: *Connecting and expanding*. This encourages metacognitive engagement and higher-order activities with the real-world/community.
- The AC: TA Year 10 documentation is dense and prescriptive, offering up a vast range of Content Descriptions and associated resources. The BCC: AE Grade 10 documents, while offering breadth and depth, present more like frameworks and support their overarching conceptual-based renewed approach to curriculum. Both instruments rely on the experience and energy of teachers and students to create meaningful and coherent learning in the arts.

Additional Observations

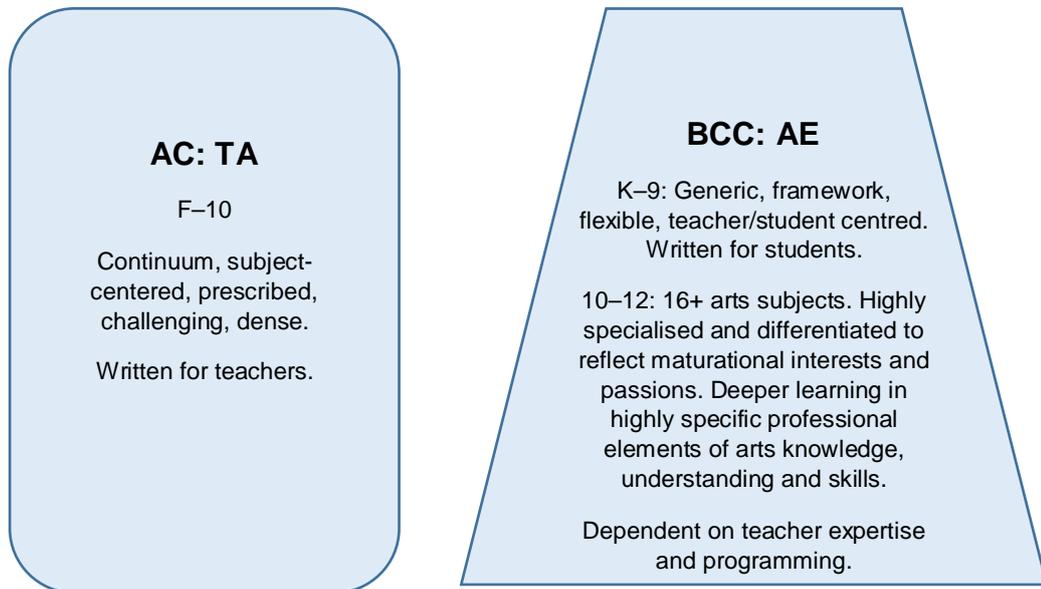


Figure 3. 1 Additional observations about AC: TA and BCC: AE

There are some overarching observations regarding the similarities and differences between The Arts curricula in Australia and British Columbia. In essence, the framework utilised in Kindergarten to Year 9/Grade 9 and in part in Grade 10 is based upon the emphasis on artistic habits of mind. The Harvard Project Zero Final Report on Artful Thinking (2006) outlines the *Artful Thinking Palette*. This informs the BCC: AE framework. The connected key ideas and performances include: Exploring and creating, Reasoning and reflecting, Communicating and documenting, and Connecting and expanding (Grade 10 only). These are creative routines that promote interdisciplinary learning and build Cross-Curricular Competencies. These skills are focused on developing strategies for deeper learning. In the first instance they are essential in the creative arts in order for students to develop a disciplined approach to creative processes. The bonus, from a BCC: AE point of view, is that students can transfer these higher order skills to other subjects and other types of learning.

The AC: TA rejects any attempt to harness all five arts subjects under one framework since each subject area attempts to differentiate unique creative processes informed from practice. The only interchangeable structures are the making and responding strands.

f) Technologies

Comparative Curricula

Australian Curriculum: Technologies

Australian Curriculum: Design and Technologies

Australian Curriculum: Digital Technologies

British Columbia Curriculum: Applied Design, Skills, and Technologies

Year/Grade Level

Australian Curriculum: Year 2

British Columbia Curriculum: Grade 2

Learning Area/Subject

Australian Curriculum: Technologies (AC: T)

British Columbia Curriculum: Applied Design, Skills and Technologies (BCC: ADST)

Expectations: Knowledge and Skills

The expected learning for the AC: T for Year 2 is presented in the achievement standards (subject-specific or learning area) for the Foundation to Year 2 band. Schools choose from two sets of achievement standards to report on student learning. The Technologies learning area has five key ideas (creating preferred futures, project management and types of thinking, systems, design and computational). There are two subjects: *Design and Technologies* and *Digital Technologies*; the two subjects have a common strand structure. The processes and production skills strand provides common threads that are addressed across both subjects. In Design and Technologies, students create designed solutions for each of the following prescribed technologies contexts: engineering principles and systems, food and fibre production/food specialisations, and materials and technologies specialisations. In Digital Technologies, students are expected to create a range of digital solutions through guided play and integrated learning as they explore digital systems and the representation of data and develop processes and production skills. The two subjects have a common strand structure.

The expected learning for the BCC: ADST is presented through the learning standards for Curricular Competencies and Content by year. It is aligned to the BC *Know-Do-Understand* curriculum model – what students are expected to know, be able to do, and understand. The BCC: ADST has three Big Ideas that reflect the intent of the Curricular Competencies and provide a progression from Foundation to Grade 12. The BCC: ADST does not include Content learning standards from K-5: *The intent and requirement is that teachers use the learning standards for Curricular Competencies from Applied Design, Skills, and Technologies K–5 with grade-level content from other subject areas to provide students with cross-curricular opportunities to develop foundational mindsets and skills in design thinking and making* (BCME, 2016d).

While the curriculum structures of the AC: T and the BCC: ADST are different, the intent in terms of developing students' skills in design thinking and creating solutions (making) is similar. The achievement standards of the AC: T and the learning standards of the BCC: ADST are quite similar in terms of skills. The main difference between the two lies in the expectations for knowledge and understanding/content. The AC: T specifies the technologies to be addressed; in the BCC: ADST skills are addressed through content from

other learning areas.

Measurement of Curriculum: Breadth, Depth and Rigour

	BREADTH			DEPTH			RIGOUR		
	Limited	Fundamental	Comprehensive	Limited	Fundamental	Challenging	Limited	Moderate	Challenging
AC									
BCC									

AC – Breadth

Breadth: Comprehensive

For students at the end of Year 2, the expectations of the AC: T are **comprehensive** in relation to breadth of coverage. They are expected to address fifteen content descriptions across two subjects: Design and Technologies and Digital Technologies. The content is presented in two strands: knowledge and understanding, and processes and production skills. This content provides the opportunity to develop knowledge and understanding of technologies and society and three technologies contexts in Design and Technologies. Breadth of coverage is judged to be comprehensive, as students explore a range of technologies contexts (engineering principles and systems, food and fibre production/food specialisations and materials and technologies specialisations). In Digital Technologies, they develop knowledge and understanding of digital systems and the representations of data. The breadth of the processes and production skills strand is comprehensive as it comprises five threads (*investigating and defining, generating and designing, producing and implementing, evaluating, and collaborating and managing*). Students are expected to create designed solutions (at least one product, one service and one environment) and digital solutions for a range of contexts from Foundation to Year 2.

Table 3.41 *Distribution of content descriptions and elaborations across strands in AC: T, Year 2*

Year 2 Technologies	Strand: Knowledge and understanding	Strand: Processes and production skills	Total
Design and Technologies content descriptions	4	5	9
Elaborations	22	21	43
Digital Technologies content descriptions	2	4	6
Elaborations	12	20	32

BCC – Breadth

Breadth: Fundamental

For students in Grade 2, the expectations of the BCC: ADST are **fundamental** in relation to the breadth of coverage. Students are expected to address fourteen learning standards across three Curricular Competencies (*applied design, applied skills and applied technologies*). These Curricular Competencies are addressed through grade-level content

from other areas of learning to provide students with cross-curricular opportunities. The intention is to develop a foundation in the skills of design thinking and making; consequently, students are expected to make a product in each year from Kindergarten to Grade 2. The breadth is fundamental as the Curricular Competencies are presented through content from other areas of learning. A small number of elaborations is provided to support some learning standards.

Table 3.42 *Distribution of curriculum components in BCC: ADST, Grade 2*

Grade 2	Applied Design, Skills and Technologies
Big Ideas	3
Curricular competencies	14
Elaborations	4
Content	-
Elaborations	-

AC – Depth

Depth: Fundamental

For students at the end of Year 2, the expectations of the AC: T are deemed to be **fundamental**. For example, in Digital Technologies, students *create and organise ideas and information using information systems independently and with others* (ACTIP006) and *recognise and explore patterns in data and represent data as pictures, symbols and diagrams* (ACDEK002). In Design and Technologies, students *explore how technologies use forces to create movement in products* (ACDK002) and *use personal preferences to evaluate the success of design ideas* (ACTDEP008).

While most content descriptions provide opportunities for students to develop a fundamental level of depth, one or two may be challenging, especially when students are required to justify their thinking. For example, the AC's ACTDEK001 asks that learners *consider sustainability to meet personal and local community needs* (ACARA, 2015).

BCC – Depth

Depth: Fundamental

For Grade 2 students following the BCC: ADST, most of the learning standards for the Curricular Competencies provide opportunities for students to develop a **fundamental** depth of learning. Grade 2 students are expected to be able to make some decisions about learning, for example *identify needs and opportunities for designing, through exploration and decide on how and with whom to share their product or use personal preferences to evaluate*. Several learning standards may be challenging, such as *explain how their product contributes to the individual, family, community and/or environment and reflect on their ability to work effectively both as individuals and collaboratively in a group* (BCME, 2016d). The elaborations for the Curricular Competencies present definitions of terms for Grade 2.

AC – Rigour

Rigour: Moderate

In general, the level of rigour of the AC: T is deemed to be **moderate**. The cognitive demand placed on Year 2 students is straightforward; they require skills to develop knowledge and understanding by recognising, exploring, identifying, and using. For example, they *explore needs or opportunities for designing...* (ACTDEP005). The level of rigour is greater when students are expected to *generate, develop and record design ideas through describing, drawing or modeling* (ACTDEP006), *...consider sustainability to meet personal and local community needs* (ACTDEK001) and *sequence steps for making designed solutions and working collaboratively* (ACDEP009) or *... represent a sequence of steps and decisions (algorithms)* (ACTDIP004) (ACARA, 2015). Pedagogical suggestions are provided through 41 elaborations that explain how the content descriptions could be addressed in the classroom, several of which provide opportunities for increased rigour.

BCC – Rigour

Rigour: Moderate

The rigour of the BCC: ADST is assessed as **moderate**. The cognitive demand placed on Grade 2 students is not overly high as they require skills to *formulate ideas and concepts, use trial and error to make changes, make a product using known procedures or through modelling of others* and *explain how their product contributes to the individual, family, community and/or environment* (BCME, 2016). While the Big Ideas of the BCC: ADST suggest a limited level of rigour, the learning standards for the Curricular Competencies expand these ideas to a moderate level. The 14 elaborations for the Curricular Competencies learning standards support and guide learning opportunities and reflect the level of rigour presented in the curriculum.

Comparative Analysis

The depth and rigour of the AC: T and the BCC: ADST are comparable, the key difference between the AC: T and the BCC: ADST being in relation to breadth. The breadth of learning in the AC: T is generally more challenging than in the BCC: ADST as students address discipline-specific content (knowledge and understanding) both in Design and Technologies and Digital Technologies as well as applying this content when creating solutions (developing skills).

The following table provides a quantitative indication that, for Year 2, the AC: T and the BCC: ADST differ in terms of breadth. The AC: T has far more content in Year 2 than the BCC: ADST. However, the skills are developmentally comparable.

Table 3.43 *Quantitative comparison of content from AC: T, Year 2 and BCC: ADST, Grade 2*

Year 2/Grade 2	Australian Curriculum		British Columbia Curriculum
	Technologies		ADST
General Capabilities/Core Competencies	7		3
Cross-Curriculum Priorities	3		-
Key ideas/Big Ideas	5		3
Knowledge and understanding content descriptions/Content learning standards	Design and Technologies	Digital Technologies	-
	4	2	
Elaborations	34		-
Processes and production skills/Curricular competencies learning standards	9		14
Elaborations	41		4 (definitions)

In BC, students develop skills (Curricular Competencies) in design thinking and making across other learning areas rather than through discipline-specific content. This approach adopted by BC educators potentially strengthens the demand to find connections between learning areas.

It should be noted that while the AC: T can be implemented as two subjects from Foundation, some states and territories may recommend implementation as an integrated subject. Schools may also decide to develop integrated units of work. This can be a powerful way to implement either Design and Technologies or Digital Technologies. For example, in Digital Technologies, another subject may provide the context for developing a digital solution, such as collect, explore and sort data, and use digital systems to present the data creatively (ACTDIP003) (ACARA, 2015) for a Science experiment or History investigation. For Design and Technologies, the opportunity to integrate with Science, for example, when exploring and creating solutions for engineered principles and systems, would reinforce concepts associated with the physical sciences.

Healy and Campbell (2016) support the benefits of an integrated approach in their study on an integrated bridges task. They note that Diaz and King (2007) “suggest that when students do real science using hands-on applications they gain cognitive skills such as problem-solving” (Healy and Campbell, 2016, p.103).

In the early years of schooling, students are curious about their world and are interested in exploring it. Both the AC: T and the BCC: ADST give a sense of what a successful learner looks like at this stage. Apart from the specifics which differentiate the two in terms of breadth, there are similarities, particularly learning through purposeful and directed play, exploring materials, tools and equipment and developing design thinking and making skills. The Early Years Learning Framework (2009) reinforces the importance of play-based learning, enabling children to make connections between previous experiences and what

they are currently learning. The literature on technology education in the early years, including Fler (2000), Benson (2013) and Lawler & Olliff-Cooper (2015) supports this.

In the AC: T, students have opportunities to learn through purposeful and directed play to develop concern for the places and resources they use. Through these processes, they identify relationships between imagined and virtual worlds and the real world, between people and products, and between resources and environments (systems thinking). They explore materials, tools and equipment and use drawing and modelling to communicate their design ideas. Students learn about and experience connections between technologies and the designed world (design thinking). They begin to learn the importance of preparing precise instructions when solving problems using digital systems (computational thinking), creating ideas and information and sharing them online with known people. In Design and Technologies and Digital Technologies, children create imaginary situations in which they change the meaning of objects and actions as they invent new ideas and engage in futures thinking (for them). They also explore real-world concepts, rules and events as they use role-play to explore what is familiar and of interest to them.

In the BCC: ADST, students are given opportunities to develop foundational skills in Applied Design, Skills, and Technologies through exploratory and purposeful play. As they get older and develop an interest in knowing how things work and making things that work, they will have opportunities to develop foundational skills in activities that have a practical and real-life focus. Students in Kindergarten to Grade 5 will develop the skills for design thinking and a maker mindset in cross-curricular contexts that they will bring to future explorations in Applied Design, Skills, and Technologies (BCME, 2016d).

Additional observations

During the consultation on the draft AC: T, there was significant feedback, particularly in relation to the primary years, for specific advice to be provided about the technologies contexts for Design and Technologies. The selection of the technologies contexts was informed by Australia's national priorities, such as food and water security, health and wellbeing, the knowledge economy and the need for innovation. This provision of technologies contexts for Design and Technologies and the decision for the Technologies learning area to comprise two subjects from Foundation to Year 8 has contributed to the rating of breadth as challenging.

Year/Grade Level

Australian Curriculum: Year 6

British Columbia Curriculum: Grade 6

Learning Area/Subject

Australian Curriculum: Technologies (AC: T)

British Columbia Curriculum: Applied Design, Skills and Technologies (BCC: ADST)

Expectations: Knowledge and Skills

The expected learning for the AC: T for Year 6 is presented in the achievement standards (subject-specific or learning area) for Year 5 and 6 band. Schools choose from two sets of achievement standards to report on student learning. The Technologies learning area has five key ideas (creating preferred futures, project management and types of thinking, systems, design and computational). There are two subjects: *Design and Technologies* and *Digital Technologies*. Both subjects have a common strand structure. The processes and

production skills strand provides common threads that are addressed across both subjects. In Design and Technologies, students create designed solutions for engineering principles and systems, food and fibre production/food specialisations and materials and technologies specialisations. In Digital Technologies, students are expected to create a range of digital solutions to further develop understanding and skills in computational thinking, such as identifying similarities in different problems and describing smaller components of complex systems.

The expected learning for the BCC: ADST for Grade 6 is presented through the learning standards for Curricular Competencies and Content. It is aligned to the BC *Know-Do-Understand* curriculum model – what students are expected to know, be able to do, and understand. The BCC: ADST has three Big Ideas that reflect the intent of the Curricular Competencies and provide a progression from Foundation to Grade 12. From Grade 6 the BCC: ADST includes Content learning standards presented as optional modules. Students will *experience a minimum of three modules* (BCME, 2016d). The expectations within these modules varies. However, each is used as the context for addressing the learning standards for the Curricular Competencies.

While the structures of the AC: T and the BCC: ADST are different, the intent in terms of developing students’ skills in design thinking and creating solutions (making) is similar. The achievement standards (of the AC: T) and learning standards (of the BCC: ADST) are quite similar in terms of skills. The main difference between the two curricula lies in the expectations for knowledge and understanding/content. The AC: T specifies the technologies to be addressed whereas teachers and students select the BCC: ADST content.

Measurement of Curriculum: Breadth, Depth and Rigour

	BREADTH			DEPTH			RIGOUR		
	Limited	Fundamental	Comprehensive	Limited	Fundamental	Challenging	Limited	Moderate	Challenging
AC									
BCC									

AC – Breadth

Breadth: Comprehensive

For students at the end of Year 6, the expectations of the AC: T are **comprehensive** in relation to breadth of coverage. Students are expected to address eighteen content descriptions across two subjects: Design and Technologies and Digital Technologies. This content provides the opportunity to develop knowledge and understanding of technologies and society and three technologies contexts in Design and Technologies. The breadth is comprehensive, as students explore a range of technologies contexts (engineering principles and systems, food and fibre production/food specialisations and materials and technologies specialisations). The breadth of the processes and production skills strand is comprehensive as it comprises five threads (investigating and defining, generating and designing, producing and implementing, evaluating, and collaborating and managing). Students are expected to create designed solutions (at least one product, one service and one environment) and

digital solutions for a range of contexts from Year 5 to Year 6. In Digital Technologies, they develop knowledge and understanding of digital systems and the representations of data. In Digital Technologies, students define problems and design, implement and evaluate a range of digital solutions including using visual programming.

Table 3.44 *Distribution of content descriptions and elaborations across strands in AC: T, Year 6*

Year 6 Technologies	Strand: Knowledge and understanding	Strand: Processes and production skills	Total
Design and Technologies content descriptions	4	5	9
Elaborations	25	24	49
Digital Technologies content descriptions	2	7	9
Elaborations	10	38	48

BCC – Breadth

Breadth: Fundamental

For students in Grade 6, the expectations of the BCC: ADST are **fundamental** in relation to the breadth of coverage. Students are expected to address 29 learning standards across three Curricular Competencies (applied design, applied skills and applied technologies). These Curricular Competencies are addressed through Content modules from the four disciplines (Business Education, Home Economics, Information and Communications Technology and Technology Education) and new and emerging fields such as Media Arts.

A wide range of modules (12) is offered, but the scope of learning is narrowed to a choice of three modules. The breadth of curriculum is determined by the choices the school makes (for instance, computing need not be addressed at all, or conversely, all three digital modules could exclude study in any other area). There is an emphasis on developing locally based modules which could either narrow the breadth of learning or expand it. Elaborations are provided to clarify the depth of some learning standards.

Table 3.45 *Distribution of curriculum components in BCC: ADST, Grade 6*

Grade 6	Applied Design, Skills and Technologies
Big Ideas	3
Curricular competencies	29
Elaborations	8
Content	50 (across 12 modules; only 3 to be addressed)
Elaborations	28

AC – Depth

Depth: Challenging

For students at the end of Year 6, the expectations of the AC: T are considered to be **challenging**. The AC: T requires students to *investigate how and why...* (ACTDEK021), allowing depth in communicating ideas and processes. Students are also asked to *critique needs or opportunities...* (ACTDEP024) (ACARA, 2015), providing an opportunity for deep understanding. Strategic thinking is evident when students are planning, creating and communicating ideas and information, negotiating criteria and evaluating. The transfer of knowledge and skills from one context to another provides opportunities for deeper engagement and the depth to which learners may explore each content description is clearly indicated with 97 elaborations across the two subjects.

BCC – Depth

Depth: Fundamental

For students in Grade 6, most of the BCC: ADST learning standards for the Curricular Competencies and Content provide opportunities for students to develop a **fundamental** depth of learning. For example, Grade 6 students are expected to *identify, plan, make changes, explain and give reasons for*. The depth is focused on developing skills and concepts and allowing students to make decisions about their learning. As a result of their explorations, students may begin to show particular interest in, and aptitude for, specific modules and set specialised learning goals. The depth of curriculum could also depend on the modules studied, as the depth of content within each module varies; this could range from limited to challenging.

AC – Rigour

Rigour: Challenging

The rigour of the AC: T is deemed to be **challenging**. The cognitive demand placed on Year 6 students requires skills to develop knowledge and understanding by investigating, evaluating, critiquing and negotiating criteria for success (for example, *negotiate criteria for success that include sustainability to evaluate design ideas, processes and solutions* (ACTDEP027)). Students are required to plan and work collaboratively, including online sharing of ideas, such as *develop project plans that include consideration of resources when making designed solutions individually and collaboratively* (ACTDEP028). In Digital Technologies, students *define problems in terms of data and functional requirements drawing on previously solved problems* (ACTDIP017) and *design, modify and follow simple algorithms involving sequences of steps, branching, and iteration (repetition)* (ACTDIP019) (ACARA, 2015). Multiple elaborations provide pedagogical suggestions for how the content descriptions could be addressed in the classroom; several of these identify opportunities for increased rigour.

BCC – Rigour

Rigour: Challenging

The level of rigour of the BCC: ADST is rated as **challenging**. The cognitive demand placed on Grade 6 students requires skills to use and develop the Core Competencies of creative and critical thinking, communication, and the personal and social competencies through the

Curricular Competencies of ADST. Most learning standards in Grade 6 are rigorous, such as *make a plan for production that includes key stages, and carry it out, making changes as needed or test the first version of the product or the prototype* (BCME, 2016d). Content learning standards are presented as topics that allow students to personalise their learning based on their own interests and passions. Multiple elaborations support the content learning standards.

Comparative Analysis

The depth and rigour of the AC: T and the BCC: ADST are comparable. The key difference between the AC: T and BCC: ADST is in relation to breadth.

In general, the breadth of learning in the AC: T is regarded as more comprehensive than that of the BCC: ADST, because students address content both in Design and Technologies and Digital Technologies. In British Columbia, the schools determine the modules offered and only three modules need to be studied throughout the year. Computing could either be completely avoided (depending on the modules chosen) or could form the entire learning content (if all three modules were offered). Locally developed modules can also replace the modules in the provincial curriculum, as explained in the statement that *This approach provides provincial recognition of the variety and scope of existing locally developed middle years programs and a template for the development of additional local programs* (BCME, 2016). The curriculum for Grade 6 can be presented as short modules that may be offered in rotation and would enable students to be exposed to several options. All of these content options provide for a very flexible delivery, but they make it difficult to measure both breadth and depth.

The depth of the BCC: ADST content learning standards varies, depending on the module and, as the modules are selected by schools, the overall depth is also difficult to determine beyond the assessment of a fundamental level. Although there are more learning standards in the BCC: ADST, compared to the number of content descriptions in the AC: T, some BCC: ADST learning standards are more like the AC: T elaborations. The depth implicit in individual AC: T content descriptions is sometimes equivalent to multiple BCC: ADST learning standards.

The elaborations for the AC: T are also quite different from those of the BCC: ADST. The AC: T elaborations provide examples of how the content description could be addressed in the classroom. The BCC: ADST elaborations clarify the learning standard or provide examples of tools or software that could be used. The table below presents a quantitative indication that in Year 6, the AC: T and the BCC: ADST differ in terms of structure and breadth.

Table 3.46 *Quantitative comparison of content from AC: T, Year 6 and BCC: ADST, Grade 6*

Year 6/Grade 6	Australian Curriculum		British Columbia Curriculum
	Technologies		ADST
General Capabilities/Core Competencies	7		3
Cross-Curriculum Priorities	3		-
Key Ideas/Big ideas	5		3
Knowledge and understanding content descriptions/Content learning standards	Design and Technologies	Digital Technologies	50 (across 12 modules – 3 modules to be addressed)
	4	2	
Elaborations	35		28
Processes and production skills/Curricular competencies learning standards	12		29
Elaborations	61		8

The AC: T achievement standards and the BCC: ADST learning standards reflect progression of achievement from the early years to the primary years in relation to skills. The BCC: ADST Big Ideas illustrate a progression of learning from Kindergarten to Grade 12. For the AC: T, there is also a progression from Foundation to Year 10 for knowledge and understanding, whereas the BCC: ADST progression for Content is from Grade 6 to Grade 12.

Through the primary years, students draw on their growing experience of family, school and the wider community to develop their understanding of the world and their relationships with others. During these years of schooling, students' thought processes become more complex and consistent and they gradually become more independent. Students also develop their capacity to work in teams. They develop a sense of social, ethical and environmental responsibility and are interested in and concerned about the future (systems thinking). Students may share changes in their own thinking and making, giving reasons for their actions and explaining and demonstrating their organisation and sequence of ideas. They begin to recognise and appreciate the different ways in which others think and respond to problems and situations, including those with a regional perspective. Students respond resourcefully to a range of design and computing problems and situations using creative and innovative ideas to realise solutions. They communicate and record their ideas in diagrams and drawings, using a range of technologies. Students explain the main functions of their solutions and the systems, materials, tools and equipment which could be used (ACARA, 2015).

The significant difference between the AC: T and the BCC: ADST is the aspect of a successful learner who focuses on responding to a range of computing problems. While this is an expectation for the AC: T, it is optional in the BCC. The position adopted by the AC: T is supported by the Horizon Report K–12 (2016), which identifies coding as a literacy (Adams Becker, 2016). The Council for Economic Development Australia (2016) indicates

Australia will require ICT students with capabilities in architecting, designing and analysing to adopt international ICT developments if its industries are to stay globally relevant.

Additional Observations

Technologies contexts

The content descriptions for the technologies contexts in the knowledge and understanding strand of the Australian Curriculum: Design and Technologies provide a framework within which students can gain knowledge and understanding about technologies and design. The technologies contexts provide a progression of learning from Foundation to Year 8 and optionally to Years 9–10 or lead to more specialised Technologies subjects in Years 9 and 10. The prescribed technologies contexts for Foundation to Year 8, presented as options in Years 9 and 10, are engineering principles and systems, food and fibre production, food specialisations, and materials and technologies specialisations.

The role and importance of the technologies contexts within the Technologies learning area are significant. The technologies contexts provide the vehicle for the Technologies processes and production skills to be developed and a framework for developing student knowledge of technologies and society. The technologies contexts have been selected to reflect national priorities and have been informed by research on science and technology literacy and the progression of learning in Technologies.

When selecting the technologies contexts for the Australian Curriculum: Design and Technologies, writers also considered the engineering and technology themes as well as the contexts most appropriate for learning about those themes, identified by Rossouw et al (2010, p. 13):

The contexts that ranked high on the list that resulted from the Delphi study appeared to consist of two sub-groups of contexts. In the first place, ... the contexts that traditionally had been used in the US as curriculum organisers: construction, production, transportation, communication, and biotechnology. The remaining contexts all seemed to reflect major global concerns. Some examples of these are: energy, food, water and medical technologies. ... “making the world a better place”. In the discussion, the panel realised that both the traditional and the global concern contexts were related to basic human needs that are addressed by engineering and technology.

A key difference between the AC: T and the BCC: ADST is that while both offer a progression of skills, particularly in terms of design process, the AC: T also offers a progression of learning for prescribed technologies contexts. The sequence of content for each of the technologies contexts was informed by the progression of concepts described in existing state, territory and international curricula, the Atlas of Science Literacy (2007) and the sequence of content in other AC learning areas, such as Science (King, 2016, p. 139).

Year/Grade Level

Australian Curriculum: Year 10

British Columbia Curriculum: Grade 10

Learning Area/Subject

Australian Curriculum: Technologies (AC: T)

Australian Curriculum: Design and Technologies (AC: DandT) (optional)

Australian Curriculum: Digital Technologies (AC: DT) (optional)

British Columbia Curriculum: Applied Design, Skills and Technologies (BCC: ADST)

Expectations: Knowledge and Skills

The expected learning for the AC: T for Year 10 is presented in the subject-specific achievement standards for the Year 9 and 10 band. The Technologies learning area has five key ideas (creating preferred futures, project management and types of thinking: systems, design and computational).

There are two optional elective subjects: Australian Curriculum: Design and Technologies (AC: DandT) and Australian Curriculum: Digital Technologies (AC: DT). States and territories may offer other Technologies electives that do not duplicate the content of the AC: T. Both subjects have a common strand structure. The processes and production skills strand provides common threads that are addressed across both subjects. In the AC: DandT, students create designed solutions for one or more of the following prescribed technologies contexts: engineering principles and systems, food and fibre production, food specialisations, materials specialisations and technologies specialisations. In the AC: DT, students are expected to create a range of digital solutions to further develop understanding and skills in computational thinking such as precisely and accurately describing problems and the use of modular approaches to solutions.

The expected learning for the BCC: ADST for Grade 10 is presented through the learning standards for Curricular Competencies and Content. It is aligned to the British Columbia *Know-Do-Understand* curriculum model – what students are expected to know, be able to do, and understand. The BCC: ADST has three Big Ideas that reflect the intent of the Curricular Competencies and provide a progression from Foundation to Grade 12. From Grade 10, the BCC: ADST includes Content learning standards presented as optional modules. Students will *personalise their learning by pursuing interests that are relevant to them* (BCME, 2016d). The expectations within these modules varies; however, each is used as the context for addressing the learning standards for the Curricular Competencies.

While the structures of the AC: T and BCC: ADST are different, the intent in terms of developing students' skills in design thinking and creating solutions (making) is similar. The achievement standards of the AC: T and learning standards of the BCC: ADST are quite similar in terms of skills. The main difference between the two curricula is in the expectations for knowledge and understanding/content. The AC: T specifies the technologies to be addressed whereas teachers and students select content from a range of modules in the BCC: ADST. The BCC: ADST does not offer an equivalent to food and fibre production and the AC: T does not offer an equivalent to family and society.

Measurement of Curriculum: Breadth, Depth, and Rigour

	BREADTH			DEPTH			RIGOUR		
	Limited	Fundamental	Comprehensive	Limited	Fundamental	Challenging	Limited	Moderate	Challenging
AC									
BCC									

AC – Breadth

Breadth: Comprehensive

For students at the end of Year 10, the expectations of the AC: T are **comprehensive** in relation to breadth of coverage. Both subjects are optional electives, and students may address up to 23 content descriptions across two subjects, AC: DandT and AC: DT. This content provides the opportunity to develop knowledge and understanding of technologies and society and five technologies contexts in Design and Technologies. This would be dependent on the technologies contexts selected. The breadth is comprehensive, as students explore a range of technologies contexts (engineering principles and systems, food and fibre production, food specialisations, materials specialisations and technologies specialisations). By the end of Year 10, students will have had the opportunity to design and produce designed solutions for one or more of these contexts. In AC: DT, they develop knowledge and understanding of digital systems and the representations of data. In AC: DT, students analyse problems and design, implement and evaluate a range of digital solutions including using object-oriented programming.

Table 3.47 *Distribution of content descriptions and elaborations across strands in AC: T, Year 10*

Year 10 Technologies	Strand: Knowledge and understanding	Strand: Processes and production skills	Total
Design and Technologies content descriptions	7	5	12
Elaborations	34	26	60
Digital Technologies content descriptions	2	9	11
Elaborations	10	44	54

BCC – Breadth

Breadth: Comprehensive

For students in Grade 10, the expectations of the BCC: ADST are considered to be **comprehensive** in relation to breadth of coverage. Students are expected to address 30 learning standards across three Curricular Competencies (applied design, applied skills and applied technologies). These Curricular Competencies are addressed through Content modules from the four disciplines (Business Education, Home Economics, Information and Communications Technology and Technology Education) and new and emerging fields such

as Media Arts. Whilst a wide range of modules (13) are offered, students determine the scope of learning. Grade 10 students specialise in Content modules of their own choice to develop their interests and skills or for post-secondary education or careers. The breadth of curriculum is determined by the choices the student makes, which could be broad or very narrow. There is an emphasis on developing locally based modules which could either narrow the breadth of learning or expand it. Elaborations are provided to clarify the depth of some learning standards.

Table 3.48 *Distribution of curriculum components in BCC: ADST, Grade 10*

Grade 10	Applied Design, Skills and Technologies
Big Ideas	3
Curricular competencies	30
Elaborations	13
Content	124 (across 13 modules; one or more to be addressed)
Elaborations	85

AC – Depth

Depth: Challenging

For students at the end of Year 10, the expectations of the AC: T are deemed to be **challenging**. The AC: DandT requires students to *investigate and make judgements* in all contexts (ACTDEK043–ACTDEK047). Higher-order thinking is needed when considering the *impact of technologies on preferred futures* (ACTDEK041), *planning and managing projects* (ACTDEP052) and *evaluating critically...take account of future risks and sustainability* (ACTDIP042) (ACARA, 2015). The depth to which learners may explore each content statement is described in multiple elaborations which provide pedagogical support for classroom implementation.

BCC – Depth

Depth: Challenging

For students in the BCC: ADST Grade 10, the learning standards for the Curricular Competencies and Content present a **challenging** depth of learning. For example, in Grade 10 students are expected to make decisions about their learning and to develop plans and processes and screen ideas. The depth of the curriculum is challenging when there is an expectation of complexity, as seen in the expectation around *critically analysing and prioritising competing factors... to meet community needs for preferred futures* (BCME, 2016d). The depth of the Content learning standards varies depending on the module; for example, in some modules there are five standards and in others there are fourteen. The pitch of these tends to vary, which results in uneven expectation of depth. As the modules are selected by students/schools, the overall depth is a little more difficult to determine and is an on-balance judgement.

AC – Rigour

Rigour: Challenging

The rigour of the AC: T is **challenging**. Year 10 students require skills to investigate and make judgements, analyse, critique and evaluate. For example, in Design and Technologies *investigate and make judgements on how the characteristics and properties of materials are combined with force, motion and energy to create engineered solutions* (ACTDEK043). Students are expected to use creative thinking skills and work collaboratively to create designed solutions. In Digital Technologies, students *design algorithms ... and validate algorithms and programs through tracing and test cases* (ACTDIP040) (ACARA, 2015). They establish comprehensive criteria for success, including sustainability considerations, and use these to evaluate their ideas and designed solutions and processes. They create and connect design ideas of increasing complexity and justify decisions. Some 114 elaborations provide pedagogical suggestions for how the content descriptions could be addressed in the classroom, several of which provide opportunities for increased rigour.

BCC – Rigour

Rigour: Challenging

The rigour of the BCC: ADST is determined as **challenging**. Grade 10 students require skills to engage in thinking and research, to critically analyse, prioritise, evaluate, critically reflect and work collaboratively. This provides the evidence for the judgement of a challenging level of rigour. Several moderate aspects of rigour at this stage of learning include *screening ideas against criteria* and *demonstrating their product to potential users*. Some 98 elaborations provide pedagogical support across the 13 content modules and support the Big Ideas of *social, ethical, and sustainability considerations, complex tasks require the sequencing of skills* and *complex tasks require different technologies and tools at different stages* (BCME, 2016d).

Comparative Analysis

While the structures of the AC: T and the BCC: ADST Year/Grade 10 are different, the breadth, depth and rigour are comparable. Both curricula make this learning area optional at this stage of learning, and choice is available within each curriculum. A key difference between the AC: T and BCC: ADST in terms of breadth is that food and fibre production is not covered in the BCC: ADST and the focus on families and society is not available in the AC: T. The alignment between the subjects and technologies contexts of the AC: T and the modules of the BCC: ADST are illustrated in the table below. Some are only partially aligned; for example, in the BCC: ADST, Power Technology addresses some aspects that could be covered in the AC: DandT (engineering principles and systems).

Table 3.49 Alignment of AC: T subjects and contexts, Year 10 to BCC: ADST, Grade 10

Australian Curriculum	British Columbia Curriculum
Design and Technologies (engineering principles and systems)	Power Technology
Design and Technologies (food and fibre production)	No equivalent
Design and Technologies (food specialisations)	Food Studies Culinary Arts
Design and Technologies (materials specialisations)	Textiles Woodwork Metalwork
Design and Technologies (technologies specialisations)	Drafting Electronics and Robotics
Digital Technologies	Web Development Computer Studies Media Arts
Both subjects	Entrepreneurship and Marketing (aspects)
No equivalent	Family and Society

While the depth is comparable, this depends to a large extent on which modules a student elected to study in the BCC. The depth of the AC: T content descriptions across technologies contexts is comparable, whereas the depth of the learning standards across BCC: ADST content learning standards varies.

The following table presents a quantitative indication that in Year 10 the AC: T and the BCC: ADST differ in terms of structure and breadth.

Table 3.50 Quantitative comparison of content from AC: T, Year 10 and BCC: ADST, Grade 10

Year 10/Grade 10	Australian Curriculum		British Columbia Curriculum
	Technologies		ADST
General Capabilities/Core Competencies	7		3
Cross-Curriculum Priorities	3		-
Key ideas/Big ideas	5		3
Knowledge and understanding content descriptions/Content learning standards	Design and Technologies	Digital Technologies	124 (across 13 modules; one or more to be addressed)
	7	2	
Elaborations	44		85
Processes and production skills/Curricular competencies learning standards	14		30
Elaborations	70		13

Students in this age range increasingly look for and value learning they perceive to be relevant, consistent with personal goals, and which will have the potential to lead to important outcomes. Increasingly, students analyse and work with more abstract concepts, consider the implications of individual and community actions and are keen to examine evidence prior to developing ideas.

Both the AC: T and the BCC: ADST describe the attributes and behaviours of a successful learner at this stage.

In the AC: T, students use technologies knowledge and understanding, technologies processes and production skills, and systems, design, and/or computational thinking to solve and produce creative solutions to problems, needs or opportunities. They communicate and record their ideas using a range of media and technologies. These specialised problem-solving activities will be sophisticated, acknowledge the complexities of contemporary life and may make connections to related specialised occupations and further study. Students develop a global perspective; they have opportunities to understand the complex interdependencies involved in the development of technologies and between the developer and user in their solutions, and how these can contribute to preferred futures. Students develop an understanding of the interdependence of technologies development, values, beliefs and environment (systems thinking). Through undertaking technologies processes, students develop systems, design and computational thinking, and organisational and project management skills (ACARA, 2015).

Through study of the BCC: ADST, students in Grade 10 have opportunities to specialise or to continue to explore their interests in more than one area. The specialisation might be driven by students' desire for practical skills in a particular area, their interests and passions, or their plans for post-secondary education or careers. Such choices allow students who are becoming increasingly independent to personalise their learning by pursuing interests that are relevant to them. As reflected in the Core Competencies of creative and critical thinking, communication, and the personal and social competencies through the Curricular Competencies, students *take creative risks in generating ideas and add to others' ideas in ways that enhance them, critically analyse and prioritise competing factors, including social, ethical, and sustainability considerations, to meet community needs for preferred futures, demonstrate their product to potential users, providing a rationale for the selected solution, modifications, and procedures, using appropriate terminology and evaluate the personal, social, and environmental impacts, including unintended negative consequences, of the choices they make about technology use* (BCME, 2016d).

Additional Observations

Numerous key concepts underpin the AC: DandT and support the development of computational thinking skills. These establish a way of thinking about problems, opportunities and information systems and provide a framework for knowledge and practice. Rather than mandating a focus on particular hardware, software or networks, the key concepts allow students to transfer their knowledge and understanding from one digital system to another. The concepts of abstraction, data collection, representation and interpretation, specification, algorithms and implementation correspond to the key elements of computational thinking.

Computational thinking involves solving problems, designing systems, and understanding human behaviour, by drawing on the concepts fundamental to computer science. Computational thinking includes a range of mental tools that reflect the breadth of the field of computer science. (Wing, 2006)

There is no requirement in the BCC: ADST to address the key concepts of digital technologies from K–10; rather, students are able to address these key concepts through optional Content modules.

A justification for the inclusion of both ICT Capability and the AC: DT is provided in an extract from the Australian Computer Society (ACS) paper *Australia's Digital Pulse* and the results of the 2014 National Assessment Program – Information and Communication Technology Literacy (NAP-ICTL) assessment (ACARA, 2016b).

... given the increasingly digital nature of the economy, it is not sufficient for Australian school students to just be comfortable using technology. Students also need to develop their technical computing skills from a young age, so that they can design, build and implement digital solutions and applications when they enter the workforce in the future. (ACS, 2015)

The fourth cycle of the NAP-ICTL sample assessment was held between 13 October and 14 November 2014. Approximately 11,000 students in Year 6 and Year 10 from 649 government and non-government schools participated in the online assessment from all states and territories including metropolitan, regional and remote areas.

The 2014 report shows a significant decline in the mean performance of Year 6 students, compared to the last assessment in 2011. Similarly, the mean performance of Year 10 students was significantly lower than the mean performance in all previous NAP-ICTL assessments (2005, 2008 and 2011). The report also shows there has been a reduction in the percentage of students in each year-level meeting the NAP-ICTL proficient standards. Investigation of NAP-ICTL 2014 and 2011 suggest that the data are most likely reflecting a true change in student ICT literacy over time (ACARA, 2016b).

ICT is addressed more broadly in the AC through the general capability, ICT Capability, across all learning areas and in two subjects, Digital Technologies and Media Arts. While the AC: DT provides rich opportunities to develop the key concepts of digital technologies, it should also contribute to students' ICT Capability. It is important, however, for all teachers to provide opportunities to develop ICT capability in all learning areas and for all teachers to model the effective use of ICT as a teaching and learning tool. The result of the next two NAP-ICTL assessments will provide important data to inform future curriculum development.

g) Health and Physical Education

Comparative Curricula

Australian Curriculum: Health and Physical Education

British Columbia Curriculum: Physical and Health Education

Year/Grade Level

Australian Curriculum: Year 2

British Columbia Curriculum: Grade 2

Learning Area/Subject

Australian Curriculum: Health and Physical Education (AC: HPE)

British Columbia Curriculum: Physical and Health Education (BCC: PHE)

Expectations: Knowledge and Skills

The AC: HPE is articulated through two interrelated strands of *personal, social and community health*, and *movement and physical activity*. By the age of seven, students are expected to be able to make simple decisions and start taking action to keep themselves and others healthy, safe and physically active. Being able to recognise opportunities for health, safety and wellbeing promotion, to examine health-related messages, and to recognise, respect and celebrate diversity are all strategies that are foundational for future learning. Building on previous learning, students identify how emotional responses impact on others' feelings, develop personal and social skills and some help seeking strategies. The curriculum expects students to broaden the range and complexity of their fundamental movement skills and investigate the body's response to different types of physical activities. The AC: HPE is distinguished by an expectation that Year 2 students be able to test alternatives to solve movement challenges and have the capacity to recognise how strengths and achievements contribute to their own and others' identities.

The BCC: PHE is described through four curricular competencies of *physical literacy, healthy and active living, social and community health* and *mental wellbeing*. Seven-year-old students are expected to be physically active every day (Grade 2 – Big Idea) and develop personal awareness and responsibility to stay healthy, safe and active. A focus on their own physical literacy, mental well-being, healthy eating, and illness prevention distinguishes Grade 2 learning.

The AC: HPE and the BCC: PHE are comparable and explicit in requiring Year 2 students to make healthy choices, be physically active in a variety of ways and build healthy relationships. Both curricula encourage interconnections between physical education and health education and expect seven-year-olds to apply their learning to their own lives. A focus on building upon students' strengths and taking action beyond the self is more explicit in the Year 1 and 2 AC: HPE.

Measurement of Curriculum: Breadth, Depth and Rigour

	BREADTH			DEPTH			RIGOUR		
	Limited	Fundamental	Comprehensive	Limited	Fundamental	Challenging	Limited	Moderate	Challenging
AC									
BCC									

AC – Breadth

Breadth: Comprehensive

For students in Year 2, the expectations of the AC: HPE are **comprehensive** in relation to breadth of coverage. The curriculum expects teachers to cover 17 content descriptions as well as nine focus areas over Years 1 and 2. This content, supported by 57 elaborations, covers a comprehensive range of health and physical activity topics from understanding identities and valuing diversity to developing movement concepts and strategies in games. Students are expected to demonstrate a wide range of understanding and skills that will assist them to make simple but informed decisions about health, safety and being active, as described in the Years 1 and 2 achievement standard. The AC: HPE also draws upon General Capabilities, particularly personal and social capability, critical and creative thinking and ethical understanding, to enhance the curriculum.

BCC – Breadth

Breadth: Comprehensive

Four Big Ideas and 26 learning standards, together with 25 elaborations, represent a **comprehensive** breadth of learning in the Grade 2 BCC: PHE. Students are exposed to content that ranges from physical literacy to protective behaviours and social and community health. Students are also expected to develop three Core Competencies of Communication, Thinking and Personal and Social, that will enable them to take increasing responsibility for their wellbeing.

AC – Depth

Depth: Fundamental

The expectations of the AC: HPE are regarded as **fundamental**. The depth to which learners are encouraged to explore content includes connecting foundational knowledge and observations with more abstract concepts such as identity. Students are also expected to move beyond recall to show that they can apply their reflections to their sense of self as well as transfer their movement skills to a range of situations. Deep and creative thinking is encouraged, whereby students are expected to create games and movement sequences to solve movement challenges. Connecting learning between strands, sub strands and threads enables application of understanding to a range of contexts. For example, in the *interacting with others* thread, describing ways to include others to make them feel they belong (ACPPS019) is related to expected learning from the *team work and leadership* thread, and students use strategies to work in group situations when participating in physical activities (ACPMP030).

BCC – Depth

Depth: Fundamental

The expectations of the Grade 2 BCC: PHE in relation to depth are **fundamental**. Students explore content by applying knowledge, developing skills and explaining influences on self-identity. The Grade 2 curriculum also expects students to transfer their movement skills to a range of situations and apply their learning to real-life situations as they *develop and demonstrate respectful behaviour when participating in activities with others*. Most content requires skills of observation, recall and demonstration. Grade 2 teachers are supported and encouraged to combine learning standards across areas of learning to create thematic units which allow for increased depth. Examples of deeper learning in Grade 2 BCC: PHE are provided through seven Competency Illustrations.

AC – Rigour

Rigour: Moderate

The terminology and expectations of the Year 2 AC: HPE, as shown in the content descriptions, are predominantly associated with the development of skills and concepts (see Webb's Depth of Knowledge), indicating a **moderate** degree of rigour in Year 2 AC: HPE. The cognitive demand placed on Year 2 students in the AC: HPE content requires them to develop skills and understanding through comparing, applying, describing and explaining, supported by the elaborations tied to a content point. The expected learning also utilises creative and collaborative skills for enabling students to apply solutions to their own issues and everyday lives. Multiple elaborations provide additional suggestions designed to encourage multiple approaches and solutions to stretch students' cognitive capacity. The Year 2 achievement standards for AC: HPE use verbs such as *identify, describe, examine, demonstrate, select* and *apply*.

BCC – Rigour

Rigour: Moderate

The BCC: PHE is structured around Big Ideas, which predominantly centre on the development of skills and concepts, indicating a **moderate** degree of rigour. The cognitive demand placed on Grade 2 students requires skills to develop, demonstrate, apply, identify, participate, explore and describe problems and tasks related to healthy and active living. There is some demand on critical and creative thinking such as exploring strategies for making healthy eating choices, explaining how participation in outdoor activities supports connections with the community and the environment. Elaborations provide examples of knowledge or skills rather than demonstrating ways that teachers can engage students in deep learning and higher-order thinking.

Comparative Analysis

The expectations of Year 2 students in the AC: HPE and Grade 2 in the BCC: PHE have much in common. Consideration of breadth, depth and rigour indicates that the two curricula are on a par with each other at this comparison point.

Both curricula organise knowledge around core concepts, provide teachers with opportunities to integrate concepts and emphasise different forms of learning (Masters, 2015). Both place an emphasis on students exploring their sense of self, keeping

themselves safe, healthy and active and knowing how to get help when they feel uncomfortable or unsafe. To achieve this, both curricula expect seven-year-olds to start to develop problem-solving strategies. The type of activities and the requirement to demonstrate and apply strategies and capabilities – many of these requiring reflection and a degree of emotional intelligence, interpersonal skills and the capacity to see themselves in a broader community or world context – set high expectations for children of about seven years of age.

UNESCO promotes learning to move and enjoying the freedom of movement as human rights (UNESCO, 1999). Movement is regarded as a powerful tool for the acquisition of many physical, personal, social and cognitive skills. In relation to physical activity, both the AC: HPE and BCC: PHE expect students to develop a range of fundamental movement skills, including playing games and understanding how the body reacts to physical activity. In the AC: HPE, Year 1 and 2 students focus on *fundamental movement skills, active play and minor games with and without equipment*. Similarly, in the BCC: PHE, movement is based around fundamental movement skills; these can be developed through *indoor or outdoor activities, free play or structured activities, and activities with or without equipment*.

There are some points of difference between the two curricula in relation to the cognitive demand placed on students. For example, the BCC: PHE requires students to explain actions, both oral and written that contribute to safe, healthy and active classroom environments. While the AC: HPE requires students to apply their understanding, there is no requirement for students to explain what they have learnt. The AC: HPE expects students to be able to articulate how physical activity affects their bodies, whereas the BCC: PHE requires students to monitor how their bodies react to physical activity. The extent to which classroom activities and assessment strategies allow students to demonstrate different levels of ability in each of these areas is likely to vary considerably.

There are also differences in the relative emphasis placed on different topics or themes. In exploring sense of self, the AC: HPE requires students to consider how they are different from or similar to other students. Whereas the focus of the AC: HPE is on personal strengths and achievements, Grade 2 students in British Columbia develop an understanding of self in relation to their interests and preferences. The use of the first person to express the Big Ideas in the BCC, particularly in a subject area like Physical and Health Education, offers a powerful indication of the student-centered nature of that curriculum. An example is found in the statement that *Our physical, emotional, and mental health are interconnected*, which lends itself to effective messaging for learners from the beginning of their schooling.

Both curricula develop students' capacity to be proactive in relation to health, the AC: HPE prioritising questions in Year 1 and 2 such as *'what keeps people healthy?'*, which builds upon individual and community assets. In contrast, the BCC: PHE encourages students to *recognise and change unhealthy behaviours*. Specific BCC: PHE Year 2 content topics include *illness prevention, strategies and skills to use in potentially hazardous, unsafe, or abusive situations and effects of different substances*. This shows an approach from the perspective of addressing potential health risks rather than building capacity in students (Quennerstedt, 2008).

There are also nuanced differences between the curricula in relation to emotional responses. Students in BCC: PHE are expected to be able to describe emotional responses and talk

about how they should respond in a variety of situations, whereas the AC: HPE requires students to apply these responses to real-life situations. There are also slight differences in the focus placed on physical activity. The BCC: PHE expects students to be active every day, compared with the AC: HPE which focuses on students using fundamental movement skills in a variety of situations.

Differences also exist in relation to the detail of learning expectations. The AC: HPE places a strong emphasis on the development of personal capabilities such as persistence and confidence. This is compared with the BCC: PHE which encourages learners to take leadership roles in physical activities. Both curricula expect students to develop social skills, but the AC: HPE is more specific in its expectations, identifying turn-taking, sharing, including others and playing fairly as essential skills. The BCC: PHE is more specific in relation to developing the ability to recognise and practise emotional responses, relating these to mental well-being.

While the learning expectations of Year/Grade 2 students in the AC: HPE and BCC: PHE are generally comparable, there are some slight differences in relation to cognitive demand, the relative emphasis placed on some content and the level of detail relating to the development of certain skills.

The AC: HPE provides Year 1 and 2 teachers with 10 HPE work samples to support their understanding of the Year 1 and 2 achievement standards. This provides more comprehensive support to AC: HPE teachers than is found in the BCC: PHE. The BCC provides only two instructional samples that relate to Grade 2 PHE: *Mindful Breathing* and *My Attributes, Our Opportunities*.

The AC: HPE explicitly requires teachers to focus on skills like problem-solving and persistence, as articulated in the prescribed curriculum content descriptions (e.g. propose a range of alternatives and test their effectiveness.) The BCC: PHE does not provide similar specific examples for Grade 2 teachers either in the Big Ideas or the learning standards. In British Columbia schools, however, teachers work with two Social Responsibility competency illustrations that encourage solving problems in peaceful ways; these do not necessarily involve the same level of cognitive demand as the AC: HPE.

Additional Observations

The AC: HPE promotes high-quality movement experiences for children from the very beginning of schooling (ACARA, 2012b). This has become a somewhat controversial issue in the Australian educational landscape, specifically in relation to the provision of appropriately qualified teachers. Year 2 teachers are sometimes viewed as not suitably trained, being either PE specialists with secondary training but limited early years training, or generalist teachers with no PE specialisation (Dinan-Thompson, 2009). There is a view that generalist teachers have better pedagogical and developmentally appropriate understanding of children and may therefore be better placed to deliver the PE content of the AC: HPE (McMaster, 2013). This issue is also acknowledged in the BCC: PHE, which offers advice about team teaching and using community resources to meet curriculum expectations.

Year/Grade Level

Australian Curriculum: Year 6

British Columbia Curriculum: Grade 6

Learning Area/Subject

Australian Curriculum: Health and Physical Education (AC: HPE)

British Columbia Curriculum: Physical and Health Education (BCC: PHE)

Expectations: Knowledge and Skills

The AC: HPE is presented through two interrelated strands: *Personal, social and community health* and *Movement and physical activity*. By the age of eleven, students are expected to have the knowledge, understanding and skills to create opportunities and take action to enhance their own and others' health, wellbeing, safety and physical activity participation. Building on previous learning, they understand the physical and social changes that are occurring for them and examine how the nature of their relationships changes over time. The curriculum expects students to develop skills and understanding about more complex movement patterns and situations through, for example, challenge and adventure activities and sport. They can effectively communicate and problem-solve in groups. Understanding how participation in physical activity can enhance health-related fitness and wellbeing across the lifespan and contribute to intercultural understanding is foundational to future learning. The AC: HPE is distinguished by the expectation that students gain an understanding of the cultural significance of physical activity.

The BCC: PHE is described through four curricular competencies of *physical literacy, healthy and active living, social and community health* and *mental well-being*. Eleven-year-old students are expected to be physically active every day and develop skillful movement as well as fitness (Grade 6 – Big Idea). A focus on physical literacy, specific fitness principles (FITT and SAID) mental health, and reducing personal and social risk distinguishes Grade 6 learning.

Both the AC: HPE and the BCC: PHE are comparable and explicit in requiring Year 6 students to expand their physical competence, understand personal and social factors that influence wellbeing and apply decision-making and problem-solving skills. Both curricula also encourage connections between physical education and health education and expect eleven-year-olds to apply their learning to their own lives and those of others.

Measurement of Curriculum: Breadth, Depth and Rigour

	BREADTH			DEPTH			RIGOUR		
	Limited	Fundamental	Comprehensive	Limited	Fundamental	Challenging	Limited	Moderate	Challenging
AC									
BCC									

AC – Breadth

Breadth: Comprehensive

For students in Year 6, the expectations of the AC: HPE are **comprehensive** in relation to breadth of coverage. The curriculum expects teachers to cover 18 content descriptions and 11 focus areas. This content, supported by 63 elaborations, covers an exhaustive range of

health and physical activity topics from understanding physical and social changes to group problem-solving and composition of movement. Students are expected to demonstrate a wide range of understanding and skills that will assist them to investigate and take action to improve their own health and that of others, monitor safety and wellbeing and achieve movement outcomes as described in the achievement standard. The AC: HPE also draws upon General Capabilities to develop relationship management skills (personal and social capability), apply critical and creative thinking processes, develop intercultural understanding and demonstrate ethical behaviour (ethical understanding) to extend the curriculum.

BCC – Breadth

Breadth: Comprehensive

Five Big Ideas and 33 learning standards, together with 33 elaborations represent a **comprehensive** breadth of learning in the Grade 6 BCC: PHE. Students are exposed to a wide scope of health and physical activity topics ranging from physical literacy and monitoring exertion levels to planning food choices, managing risk and personal goal setting. Students are also expected to develop three Core Competencies of Communication, Thinking and Personal and Social, that will enable them to deepen their understanding of and take increasing responsibility for their wellbeing.

AC – Depth

Depth: Challenging

The expectations of the AC: HPE for eleven-year-olds are considered to be **challenging**. The depth to which learners may explore a range of complex topics is indicated through content descriptions and further through extensive elaborations that include possible critical inquiry approaches. The curriculum expects students to use higher order thinking in the majority of content descriptions to plan and enact creative solutions to promote health as well as solve and assess movement challenges. Interconnected learning across AC: HPE sub- strands requires cognitive effort to transfer thinking and learning from one context to another.

BCC – Depth

Depth: Fundamental

On balance, the expectations of the Grade 6 BCC: PHE in relation to depth are regarded as **fundamental**. The depth to which students explore topics is indicated both through Curricular Competencies and associated elaborations. The majority of the Grade 6 Curricular Competencies involve demonstrating skills, participating in activities, identifying preferences, recall, prediction and comparison in order to complete tasks. Additional cognitive effort is required for students to master some content to refine their movement skills and be able to analyse health messages and explore strategies for managing change. Some elaborations provide examples of problem-solving and investigation, assessment and reflection.

AC – Rigour

Rigour: Moderate

The terminology and expectations of the Year 6 AC: HPE, expressed through the content descriptions, are predominantly associated with the development of skills and concepts (as

per Webb's Depth of Knowledge), indicating a **moderate** degree of rigour. The cognitive demand placed on Year 6 students in the AC: HPE content requires them to develop skills and understanding through investigating, planning, examining, exploring, negotiating and applying critical and creative thinking in movement and health contexts. Elaborations reinforce multiple approaches and provide further support to stretch students' cognitive capacity. The expected learning also demands that students use flexible thinking, use conceptual knowledge and apply solutions to real life issues beyond the classroom. The Year 6 achievement standard for AC: HPE requires the application of conceptual knowledge in order to make judgements or collaboratively and creatively solve a problem.

BCC – Rigour

Rigour: Moderate

The BCC: PHE is structured around Big Ideas, which predominantly centre on the development of skills and concepts, indicating a **moderate** degree of rigour. The cognitive demand placed on Grade 6 students involves development of the skills to develop, demonstrate, apply, identify, participate, explore and describe problems, impacts and solutions related to healthy and active living. Some elaborations suggest more complex thinking that invites reasoning and probes underlying thinking.

Comparative Analysis

The AC: HPE and the BCC: PHE provide comparable breadth of content and rigour at this comparison point. Evidence from the achievement standards and content descriptions suggests that there is greater depth in the AC: HPE.

Both curricula focus on the educative purpose of providing explicit learning about health and movement to contribute to, but not necessarily to solve, society's health and wellbeing issues (ACARA, 2012b). The BCC: PHE expects students to describe how their participation influences their health and fitness. The AC: HPE requires students to investigate the role of preventative health. Both curricula also value movement as an asset that involves knowledge, understanding, skills and dispositions, leading to competence, confidence and positive health outcomes (ACARA, 2012b). Australian students explore the role played by outdoor activities in supporting health and creating connectedness, whereas British Columbia's students describe the physical activities they prefer. Both Year 6 curricula detail essential topics and skills that protect and promote physical, social, and emotional health and safety and provide students with opportunities to practice health enhancing behaviours (Centre For Disease Control, 2013). The AC: HPE expects students to plan and practice health promoting strategies whereas BCC: PHE expects students to describe how their behaviours influence their own health and fitness.

There is also parity in content covering physical, emotional and social changes during puberty and diverse influences on identity. Application of movement concepts and strategies and regular participation in physical activity feature in both curricula as does demonstrating leadership, safety and fair play. Eleven-year-olds in both countries are expected to be involved in a range of physical activities that may be for individuals or groups, take place indoors or outdoors, and be competitive or non-competitive.

Some points of difference are apparent between the two curricula. Although both provide opportunity for extended thinking, there is evidence that these opportunities are more

prominent in the AC: HPE. The BCC: PHE features content exclusive to facts that students are expected to know. These facts include specific principles for training and dealing with emergencies. In many cases, the BCC: PHE elaborations encourage deeper levels of thinking. Although each curriculum points to a variety of physical activities, the BCC: PHE retains a focus on fundamental movement skills whereas the AC: HPE content includes a shift to more specialised physical skills. An explicit focus of the BCC: PHE requires students to monitor and adjust exertion levels during physical activity, which is not a focus of the AC: HPE. Apart from three references to strategies for the wellbeing of others, the BCC: PHE puts an emphasis on personal health and active living, even in the social and community health competencies. By contrast, the AC: HPE consistently focuses on the health, safety and wellbeing of others and the community in addition to personal wellbeing. Compared to the BCC, the AC: HPE expects that students can demonstrate more complex movement patterns (beyond fundamental movement skills), have specialised skills for games and sports, and can assume a variety of roles and responsibilities in teams and outdoor activities. The BCC: PHE, however, expects a more explicit understanding of mental wellbeing and that students can develop strategies for dealing specifically with mental health problems.

The two curricula also reveal differences in the flexibility of content used by teachers. Overall, the AC: HPE provides more flexibility to account for shifting patterns of influences, needs, interests and priorities in health and physical activity, whereas the BCC: PHE explicitly describes current health issues, strategies and illnesses such as life-threatening communicable diseases. The BCC: PHE specifically lists diseases such as HIV/AIDS, hepatitis B and C and meningococcal C and explicitly mentions discrimination, bullying, substance use, psychoactive substances, risks, addictive behaviours, abuse, exploitation and harm. What presents at this stage as a deficit view of health in the BCC: PHE contrasts with an open-ended, strengths-based approach adopted by the AC: HPE that focuses on recognising, valuing and harnessing individual and community resources to positively influence health, safety and active living of 11-year-olds.

Successful 11-year-olds in Australia and in British Columbia relate to their peers and the world around them. They understand physical, social and emotional changes that are happening for them, how relationships change over time and how to promote health. They develop skills in and understanding about more complex movement patterns. Students know how to cope with puberty, establish and manage respectful relationships and can source reliable information about health, safety and wellbeing. Successful students have the knowledge, skills, and mindsets to successfully participate in a wide range of physical activities. They have the skills and knowledge to make healthy lifestyle choices, both in and out of school, including healthy eating and daily physical activity.

Year/Grade Level

Australian Curriculum: Year 10

British Columbia Curriculum: Grade 10

Learning Area/Subject

Australian Curriculum: Health and Physical Education (AC: HPE)

British Columbia Curriculum: Physical and Health Education (BCC: PHE)

Expectations: Knowledge and Skills

The AC: HPE is articulated through two interrelated strands of *personal, social and community health*, and *movement and physical activity*. The curriculum expects students, by the age of fifteen, to be able to critically analyse health and physical activity information in order to apply and refine strategies that build and optimise personal and community health and wellbeing and improve their own and others' performance. In Year 10, students apply more specialised movement skills and complex movement strategies and concepts in different movement environments. The curriculum also provides opportunities for students to refine and consolidate personal and social skills in demonstrating leadership, teamwork and collaboration in a range of physical activities. The AC: HPE is distinguished by an expectation that students can analyse how participation in physical activity and sport influences an individual's identities and can explore the role participation plays in shaping cultures.

The BCC: PHE is described through four curricular competencies of *physical literacy, healthy and active living, social and community health and mental well-being*. Fifteen-year-olds are expected to become adept at a range of physical skills and understand how this increases confidence, encourages lifelong participation in physical activities and leads to overall health. They understand consequences of health-related decisions and behaviours. The expectations that students develop healthy habits in all areas of health and that they will retain this commitment after graduation are distinctive features of Grade 10 learning.

The AC: HPE and the BCC: PHE are comparable in requiring fifteen-year-olds to develop a holistic understanding of health and access, and to synthesise and apply health information from credible sources to make responsible and informed health-related decisions. Both curricula encourage interconnections between physical education and health education and expect fifteen-year-olds to apply their learning to their own lives. However, students' accountability for taking action at a personal level is more explicit in the BCC: PHE and is reflected in all five Big Ideas. The role of the Grade 10 curriculum in British Columbia is to prepare students for Grade 11 and 12 PHE courses; the AC: HPE is designed to provide more general content.

Measurement of Curriculum: Breadth, Depth and Rigour

	BREADTH			DEPTH			RIGOUR		
	Limited	Fundamental	Comprehensive	Limited	Fundamental	Challenging	Limited	Moderate	Challenging
AC									
BCC									

AC – Breadth

Breadth: Comprehensive

For students in Year 10, breadth of content coverage in the AC: HPE is assessed as **comprehensive**. The curriculum expects teachers to cover 18 content descriptions and 10 focus areas over Years 9 and 10. This content, supported by 76 elaborations, covers an exhaustive range of health and physical activity topics from empathy, ethical decision making, and considering diverse communities to personalised fitness plans. Students are expected to demonstrate a wide range of understandings and skills that will enable them to apply informed decision-making when taking action to enhance their own health and that of others, and to consider safety, wellbeing and movement as described in the achievement standard.

BCC – Breadth

Breadth: Comprehensive

Five Big Ideas and 36 learning standards represent a **comprehensive** breadth of learning in the Grade 10 BCC: PHE. Students are exposed to a wide scope of health and physical activity topics, including overcoming barriers to participation in physical activities, sexual health and analysing impacts of technology. Students are also expected to develop three Core Competencies of Communication, Thinking and Personal and Social that will enable them to continue to take positive action for their health and wellbeing for the rest of their lives.

AC – Depth

Depth: Challenging

Based on consideration of content coverage, the expectations of the AC: HPE are deemed to be **challenging**. Students are expected to use strategic and extended thinking governed by the Year 10 content descriptions. They are expected to evaluate emotional situations, critically analyse health information, examine the impact of transitions on relationships, evaluate decision making, critique contextual factors, and transfer understanding from one context to others. This learning places significant cognitive demand on students and requires teachers to create rich environments for students to successfully complete such tasks. The curriculum provides opportunities for connecting learning between strands, sub-strands and threads. Students are expected to transfer learning between physical and health-related issues in order to synthesise their learning.

BCC – Depth

Depth: Fundamental

On balance, the expectations of the Grade 10 BCC: PHE in relation to depth are considered to be **fundamental**. A high proportion of the Curricular Competencies require students to participate in fitness activities, demonstrate techniques relating to safety, fair play and leadership, plan ways to overcome barriers and explain how physical competence can encourage lifelong participation in activity. A lesser number of competencies expects students to explore content at a challenging level when they refine and apply movement skills, concepts and strategies, and critically analyse health-related decisions and strategies that affect wellbeing. Teachers are provided with examples where learning can relate to

other curricula prescribed by the province. Connecting knowledge is optional but allows for depth as students transfer knowledge from one learning area to solve problems in another. For example, BCC: PHE connects to BCC: Social Studies when students are discussing group processes and teamwork, leadership, and rights and responsibilities at home, at school and in the community.

AC – Rigour

Rigour: Challenging

The terminology and expectations of the AC: HPE content descriptions are associated with a **challenging** degree of rigour. The cognitive demand placed on Year 10 students is high; they have to develop skills and understandings to evaluate, critically analyse, examine, propose, investigate, critique, analyse, refine, reflect and transfer understanding from one context to others. The AC: HPE expects that Year 10 students apply self-generated solutions to complex real world issues; for example, students are expected to *plan and evaluate new and creative interventions that promote their own and others' connection to community and natural and built environments*. The curriculum requires that students uncover and select relevant and credible supporting evidence for their analyses, judgements and solutions. The breadth and depth of curriculum content in the AC: HPE sustain inquiry into personally and socially relevant issues and topics. Further examples of the curriculum's capacity for rigour are provided through an extensive set of elaborations such as *critiquing media representations of diverse people and analysing what makes (or could make) the representations inclusive*. The Year 10 achievement standard for HPE uses language such as *critically analyse, synthesise, justify, design and refine*.

BCC – Rigour

Rigour: Moderate

The Grade 10 BCC: PHE is structured around five Big Ideas which predominantly centre on the development of skills and concepts, indicating a **moderate** degree of rigour. While the learning standards are sequential and coherent, intellectual challenge is more variable. The cognitive demand placed on Grade 10 students draws on skills to understand influences on goal setting and healthy choices, be regularly active and take action to improve personal health and wellbeing. Eight out of 36 Learning Standards demand complex thinking to critically analyse, create strategies and evaluate through critically analysing and explaining health messages and the impacts of technology and investigating their potential influences on health and wellbeing. The Grade 10 BCC: PHE also includes lower-level thinking strategies such as *demonstrate safety, fair play, and leadership in physical activity*. As the Grade 10 curriculum is in draft, there are currently no elaborations to provide more detail about rigour.

Comparative Analysis

Content covered both in the AC: HPE and BCC: PHE is similar in breadth. However, on balance, the AC: HPE requires more depth and rigour.

Both the BCC: PHE and the AC: HPE offer evidence-based, forward-thinking materials. Across both jurisdictions, the curriculum content for this age group is contextualised in cultural, social and institutional terms (OECD, 2016d,e). Successful students in both countries can critically analyse socio-cultural factors that impact on wellbeing, relationships,

decisions and behaviours and propose ways to counter prejudice and prevent violence and harassment. There are similarities in the cognitive demand in some content of both curricula. The AC: HPE requires students to *examine the role physical activity, outdoor recreation and sport play in the lives of Australians and investigate how this has changed over time*. Similarly, the Grade 10 BCC: PHE expects students to know *potential short- and long-term consequences of health decisions, including those involving physical activity, healthy eating, sleep routines, and technology*.

In both jurisdictions, the integrated study both of physical education and health education is designed to provide immediate and lifelong benefits (Graham, 1998). Both curricula also require students to understand the place of health and physical activity in a rapidly changing world, including the importance of staying physically active throughout life and participating in a wide range of activities. The AC: HPE and BCC: PHE implicitly expect students to use technology to make and track personal fitness plans as well as analyse movement and use feedback to improve and refine movement skills. Students are expected to display leadership and team work in a variety of physical activities.

Both curricula, through links to AC general capabilities and British Columbia core competencies, promote cross-disciplinary, team-based problem-solving skills (Masters, 2015) as part of the AC: HPE and BCC: PHE learning areas. The Year 9 and Year 10 AC: HPE have strong links to the personal and social capability, allowing students to *investigate how empathy and ethical decision making contribute to respectful relationships*. The Personal and Social core competency is strongly reflected in the BCC: PHE, when students *develop skills for maintaining healthy relationships and responding to interpersonal conflict, including communication skills, negotiation strategies and conflict resolution techniques*.

Successful Year 10/Grade 10 students in both jurisdictions can question what they see and hear, access, and apply health information as well as take action to improve their health and wellbeing. However, the AC: HPE places a more consistent and greater emphasis on the health, safety, wellbeing and physical activity of others and the community, as well as self. Year 10 AC: HPE students are expected to understand how the health, safety and activity choices of others are made. The AC: HPE also explicitly requires that Year 10 students become skilled at cardiopulmonary resuscitation (CPR). This skill is not mentioned in BCC: PHE.

There are other differences between the two curricula. In BCC: PHE, one of the aims of Grade 10 is to prepare students for Grade 11 and 12 PHE courses. The Year 10 AC: HPE is not designed as a prerequisite to Year 11 and 12 studies. The AC: HPE demands a more explicit focus on analysis of attitudes, beliefs, diversity, community connection and wellbeing. The BCC: PHE expects students to develop social skills such as conflict resolution. However, the AC: HPE expects students to evaluate the outcomes of using these skills. The BCC: PHE expects students to monitor and adjust fitness interventions whereas the AC: HPE expects interventions to be evaluated and also applied in the wider community. The BCC: PHE explicitly mentions technology as one of the contextual factors, whereas this is implicit in the AC: HPE as one of many external influences.

As a measure of cognitive difference, the Year 9 and Year 10 AC: HPE demand consistent use of complex thinking to engage with content and demonstrate achievement, whereas the

BCC: PHE gives more weight to fundamental skills such as describing, demonstrating, identifying and developing.

As a final observation, both the AC: HPE and the BCC: PHE focus on health literacy (Nutbeam, 2006). This is more explicitly described in the AC: HPE as a personal and community asset to be developed, evaluated, enriched and communicated as one of the five underpinning propositions in the AC: HPE. Year 10 AC: HPE students are expected to develop knowledge and understanding of and skills in all three dimensions of health literacy: functional, interactive and critical.

Additional Observations

There is a noteworthy difference between the AC: HPE Year 10 and the BCC: PHE Grade 10 in relation to the delivery of mandated learning. The BCC: PHE rationale states that some topics within PHE must be approached with sensitivity and care because of their personal nature and connections to family, religious, or cultural values. In Grade 10, the BCC: PHE makes explicit mention of the option for some topics outlined in learning standards to be addressed at home. The content must still be covered and students are still expected to demonstrate their understanding of it. Such an option is not explicitly addressed in the AC: HPE.

Support for Year 10 teachers to deliver the curriculum also varies between BCC: PHE and the AC: HPE. There are no instructional samples to support Grade 10 teachers in the BCC: PHE, whereas the AC: HPE provides nine diverse work samples that support Year 9 and 10 teachers to make judgements about student learning.

Nomenclature

The title of the learning area *Physical and Health Education* in the BCC: PHE emphasises health education rather than health. This is a small but significant difference. The BCC: PHE brings together physical education and health education in order to promote and develop all aspects of wellbeing. With strong links to British Columbia's personal awareness and responsibility core competency, the learning area focuses on the diversity of skills, strategies and dispositions necessary for healthy living, such as goal setting, emotional regulation, respecting rights of self and others, stress management and perseverance. The BCC: PHE rationale states that giving students opportunities to be physically active and providing information about health and safety is likely to have a long-lasting effect on behaviour.

Both curricula integrate physical education and health education, ensuring breadth of coverage of each while supporting their interconnectedness.

Both curricula describe the importance of advocacy for the safety, health and wellbeing of others and are designed to provide lifelong benefits. Personal wellbeing and healthy habits are seen as principles of educational transformation in British Columbia and thereby reinforce the need for Physical and Health Education as part of a *complete* education. Similarly, the OECD promotes developing the whole child (OECD, 2015).

Variation in models

In the BCC: PHE, there is an explicit and continual reference to recognising and changing unhealthy behaviours. This could be viewed as a deficit model of health. In contrast, Australia's national HPE curriculum maintains a consistent strengths-based approach and

emphasises questions such as *What keeps me healthy and active?* rather than *What risks, diseases and behaviours should I learn to avoid?* (McCuaig, Quennerstedt, & Macdonald, 2013).

The BCC: PHE defines health as *physical, social and mental wellbeing*, whereas the AC: HPE defines health holistically as *a state of complete physical, social, emotional, mental and spiritual wellbeing*. The World Health Organisation defines health as “a state of complete physical, mental and social well-being and not merely the absence of disease or infirmity” (World Health Organisation (WHO), 1948). Like the AC: HPE, the BCC: PHE acknowledges the need for lifelong physical health and mental wellbeing and aims to develop a holistic understanding of health. The BCC: PHE explicitly links health with wellbeing, physical and mental health, and emphasises the importance of positive relationships.

British Columbia foregrounds the incorporation of the Core Competencies of Communication, Thinking and Personal and Social Competency as especially relevant to the PHE. The rationale of the BCC: PHE outlines the importance of students being able to access and analyse information in order to be able to make informed choices. This approach has close connections with the AC: HPE which describes access, evaluate and synthesise information to take positive action to protect, enhance and advocate for their own and others' health, wellbeing, safety and physical activity participation across their lifespan.

The BCC: PHE is organised in terms of the Curricular Competencies of Physical Literacy, Healthy and Active Living, Social and Community Health, and Mental Wellbeing. Three of these four competencies are contained within the AC: HPE strands and content descriptions. Mental health and wellbeing is a focus area in the AC: HPE and specific content is consistent with AC: HPE threads of identity, interacting with others and changes and transitions.

BCC: PHE learning standards address influences on healthy choices, including social and peer pressure, differing sources and validity of health information and situational factors. The BCC: PHE articulates its support of student inquiry by giving students opportunities to build their own understanding of important health, physical activity and safety topics. It supports students to develop their own knowledge and understanding of how to analyse these types of situations and respond in ways that are both authentic and beneficial to them. A similar intent is reflected in two of the AC: HPE propositions: developing health literacy and including a critical inquiry approach.

Physical literacy

Physical literacy features explicitly in the BCC: PHE and has been accepted across Canada as a concept (Tremblay, 2015). It is the one Curricular Competency that is not explicitly mentioned in the AC: HPE. However, student acquisition of knowledge, skills and dispositions that enables them to participate successfully in a wide range of physical activities can be found throughout the three Movement and Physical Activity sub-strands in the AC: HPE. Internationally, there is still some debate about the meaning and value of the term *physical literacy* in schools (Corbin, 2016).

Curriculum design

Both the Australian and British Columbia curricula offer flexibility to teachers in the way they organise HPE/PHE. The choice of formats is based on the individual student, teacher,

school and community contexts. While Australia's curriculum was written with the notional timetabling of approximately two hours per week, the BCC: PHE does not stipulate time allocation (other than everyday) and allows teachers to decide how much time to spend on each aspect of content as well as where to teach it (at school or in the community).

Another difference between the two curricula is that BCC: PHE describes learning by year level whereas the AC: HPE is organised by two year bands of learning from Year 1 to 10. Only Foundation content is provided as a single year level.

Whole school and community approaches

Whole school and community approaches are outlined as important strategies for supporting both the HPE and PHE learning areas. Although Australian schools are implicitly encouraged to see parents as partners in their students' learning, BCC: PHE explicitly acknowledges that some parents may feel more comfortable addressing some of the PHE health curriculum content at home. This ensures that, regardless of where the curriculum is delivered, students will still be able to demonstrate their achievement of learning standards. This is a significant difference between the AC: HPE and the BCC: PHE.

Connections across learning areas

The BCC: PHE encourages links to other curriculum areas and examples of this are provided. In the AC there are also opportunities to connect learning in HPE with other learning areas. Examples of this for Years 2, 6 and 10 are provided via the Curriculum Connections resources of Food and wellbeing and Outdoor learning. In these resources, authentic and meaningful connections are made between HPE, Design and Technologies, Science, Humanities and Social Sciences and Mathematics.

h) Languages

Comparative Curricula

Australian Curriculum: Languages, Italian

British Columbia Curriculum: Second Languages, Italian

Year/Grade Level

Australian Curriculum: Year 2 and Year 8

British Columbia Curriculum: Grade 6

Learning Area/Subject

Australian Curriculum: Languages (AC: L), Italian

British Columbia Curriculum: Second Languages (BCC: SL), Italian

Expectations: Knowledge and Skills

The AC: L includes fourteen foreign language-specific curricula and two frameworks. In the AC: L there are two sequences of learning, one from Foundation to Year 10 and one from Year 7 to 10. First, second, and background learner pathways have been developed for use with language learners who possess varying levels of knowledge and skill in some languages such as Chinese, Australian Sign Language (Auslan) and the Framework for Aboriginal Languages and Torres Strait Islander Languages. This framework also has a language revival pathway for learners.

The curriculum for all languages and frameworks is structured around two interrelated strands: *Communicating* and *Understanding*, with the same sub-strands of *socialising, informing, creating, translating, reflecting, systems of language, language variation and change* and *role of language and culture* in both sequences and in all pathways. In the AC: L, learning is described in bands of years (F–2, 3–4, 5–6, 7–8, 9–10) and for Year 7 entry (7–8 and 9–10). As the Year 2 (F–10) and Year 8 (Year 7 entry) content is described in bands, the curriculum does not make explicit the developmental sequence of learning from Foundation and from Year 7.

The BCC: SL encompasses nine languages. The BCC material has one sequence for all second languages, with Grade 5 as the entry point in all except French. Recognising the historical and cultural significance of this language both at regional and at national level in Canada, the BCC also contains a second language immersion pathway from K–12 for French. In the BCC, learning is described in single grade groups. The same structures apply across languages and years of learning of the BCC: SL as they do in all other learning areas: Big Ideas, Learning Standards which include Curricular Competencies (what students are expected to be able to do) and Content (what students are expected to know). The Big Ideas and Curricular Competencies have Elaborations which further define the knowledge and skills required. Curricular Competencies include the sub-categories of Language Thinking, Communication and Personal and Social Awareness, while the Content specifies students' understanding of languages as systems.

The AC: L and the BCC: SL both include a number and range of foreign languages as subjects within a Languages area of learning. Both base the shape, design and structures of these curricula on frameworks that result in a high level of commonality across languages. For the purposes of comparison, this paper considers one language common to both

curricula: Italian. Comparisons are made for Italian in Year 2, Grade 6 and Year 8, as follows:

AC: L Year 2 (the third year in the AC: Languages F–10 sequence) and Year 8 (the second year in the AC: Languages (Year 7 entry) sequence).

BCC: SL Grade 6 (the second year in BC’s Years 5–12 sequence).

Measurement of Curriculum: Breadth, Depth and Rigour

Given the differing entry points and age of the students, it is not possible to make completely straightforward comparisons of content in relation to breadth, depth and rigour. At the end of Year 2 (F–2), a student learning Italian through the AC will have studied the language for three years and will be aged about seven. At the end of Year 8 (Year 7 entry) the Australian student will have studied Italian for two years and be about 13 years old. The student of Italian in British Columbia will have completed two years of study of the language by the end of Grade 6 and will be about 11 years old.

	BREADTH			DEPTH			RIGOUR		
	Limited	Fundamental	Comprehensive	Limited	Fundamental	Challenging	Limited	Moderate	Challenging
AC									
BCC									

AC – Breadth

Breadth: Comprehensive

For students in Year 2 and Year 8, the expectations of the AC: L are considered to be **comprehensive** in terms of breadth of coverage.

Within the Competency strand, each sub-strand includes a number of threads of content descriptions, each of which provides elaborations as examples of how the content might be interpreted in the classroom. Also included are key concepts and key processes, as well as text types in the creating sub-strand. The elaborations, key concepts (KCs), key processes (KPs) and text types vary considerably in nature and number in each of the sequences.

Learning the language in order to communicate with others and learning how language works as a system are both strategies that are integrated with the aim of understanding the cultural context of language. Students are expected to develop their knowledge and skills in the language within appropriate topics that begin with the local and familiar (family, friends) and expand to broader conceptual contexts (society, fact, opinion, equivalence).

The sub-strand of socialising (see explanatory note in table below) for the Year 2 Italian (F–10) sequence has four content descriptions (CDs), 22 elaborations, with a total of nine key concepts (KCs) and 10 key processes (KPs) and one text type. This same scope and range of content, concepts and processes are all reflected in each sub-strand both of the Year 2 and Year 8 content.

Table 3.51 *Sub-strands of AC: L (Italian) in Year 2 and Year 8 (Year 7 entry)*

Strand: Communicating								
Sub-strand	Year 2 (F–10)				Year 8 (Year 7 Entry)			
	CDs	Elaborations	KCs	KPs	CDs	Elaborations	KCs	KPs
Informing	2	9	7	4	2	8	5	8
Creating	2	9	6 and 1 text type	6	2	7	8 and 5 text types	4
Translating	2	7	4	3	2	8	3	5
Reflecting	4	20	6	5	2	6	6	6
Total (including Socialising as per text above)	14	67	32	28	12	38	36	36

Note: The differences in the breadth of elaborations, key concepts and key processes at Year 2 and Year 8 reflect the differences in coverage of topics and contexts in the early years of language learning for the different age groups. This content represents three and two years of learning respectively, rather than the breadth for a single year.

BCC – Breadth

Breadth: Comprehensive

The Grade 6 Italian content builds upon the content described for Grade 5 and uses the same structures to ensure a developmental sequence of learning is articulated. For students in Grade 6, the expectations of the BCC: SL Italian are **comprehensive** in relation to coverage. The breadth of the curriculum is delineated by the Big Ideas which act as drivers of *understanding*.

Table 3.52 *Content statements in BCC: SL (Italian), Grade 6*

Learning Standards	Big Ideas	Curricular Competencies			Content
		Language Thinking	Communication	Personal and Social Awareness	
	6	5	5	4	7
Elaborations	4	28			

The Six Big Ideas function as conceptual organisers:

- Listening and viewing
- Strategies to help understanding
- Basic language skills to describe
- Reciprocal communication
- Stories communicate ideas
- Learning about language from diverse communities develops cultural awareness.

Each Big Idea is expressed from the students' point of view, utilising the first person, and reinforcing the accountability of the student for his or her own learning. For example, Grade 6 statements are that *Listening and viewing with intent helps us understand a message; Using strategies helps us understand and acquire language*, and these develop conceptually from Grade 5 to Grade 6.

AC – Depth

Depth: Challenging

The expectations of the AC: L Italian, Year 2 (F–2) are deemed to be **challenging**, based on consideration of the coverage of skills and knowledge. The focus at this stage is on listening, imitating, recalling, repeating, and recognising verbal and non-verbal cues. There is a transition from spoken to written language and students are very dependent on teacher scaffolding and modelling. Students produce formulaic expressions within familiar contexts; as they are in their first three years of schooling, they are still establishing communication and literacy skills in their first language and are learning to apply these skills to the second language. They are expected to demonstrate a basic understanding of the differences and similarities in the cultural practices of Italians and Australians.

The expectations of the AC: L Italian, Year 8 (Year 7 entry) are regarded as **challenging**, based on the coverage of skills and knowledge. In Year 8 (Year 7 entry) students are in their second year of second language learning. Many of the cognitive demands of the AC: L for students at this stage are similar to those expected in Year 2 above. At about 13 years of age, students are also expected to use higher-order skills and deep thinking to *negotiate alternatives (ACLITC097), interpret (ACLITC104), reflect (ACCLITC106), (ACLITC107), analyse variable linguistic features ... according to the contexts of situation and culture (ACLITU111), analyse and understand the place of Italian locally and internationally... in the ecology of languages in Australia) and reflect on the role of language and culture in interaction and how language constructs and reflects assumptions and values (ACLITU114).*

BCC – Depth

Depth: Fundamental

The expectations of the BCC: SL Italian, Grade 6 are assessed as **fundamental**, based on the coverage of skills and knowledge.

Students are expected to *recognise, identify, comprehend, use strategies, interpret, respond, exchange ideas, seek clarification, demonstrate awareness and identify*. There is only one mention of a higher-order skill in the Curricular Competency of Personal and Social Awareness, which is to *reflect on personal, shared, or others' experiences of place*. The

elaboration on this curricular competency explains that *Place in any environment ... people interact to learn, create memory, reflect on history...*

There is no explicit reference indicating the depth of the skills, capabilities and knowledge expected. Deeper thinking is implicit in British Columbia's Big Ideas and Curricular Competencies, such as in *Communication, Thinking and Personal and Social Competency* but these are not made explicit in the BCC: SL Italian, Grade 6.

AC – Rigour

Rigour: Challenging

The AC: L Italian, Year 2 content develops skills and understanding through a range of key processes: comparing, connecting, conveying information, deciding together, decoding, exchanging, explaining, expressing, identifying, preferences, miming, noticing, observing, participating, performing, playing, predicting, relating, responding, selecting, and sharing. In summary, these expectations indicate a **challenging** degree of rigour.

Students are given multiple opportunities to apply capabilities, strategies and knowledge to a range of contexts, which can be challenging for students in their third year of formal schooling. The elaborations give clear direction to teachers on how to provide learning experiences that are challenging and allow students to engage with Italian in deeper and broader ways.

The AC: L Italian, Year 8 (Year 7 entry) content develops skills and understanding through a range of key processes: interacting, exchanging, describing, negotiating alternatives, deciding, responding, transacting, ordering, questioning, classifying, comparing, tabulating, presenting, understanding, expressing, translating, interpreting, noticing, reflecting, connecting, exchanging, reflecting and analysing. These expectations of performance in another language are evidence of a **challenging** degree of rigour.

Year 8 constitutes the second year of learning another language, and the AC: L recognises that students in their ninth year of schooling bring existing language learning strategies and intercultural awareness to the new experience of learning Italian. Students' textual knowledge developed through English literacy learning also supports the development of literacy in Italian (AC: L Year 7 and 8 Band Descriptions, the nature of the learners). There is an expectation that students will develop skills of analysing, reflecting, problem-solving and evaluating. The elaborations provide suggestions for teacher action that encourage multiple approaches, strategies and solutions to help facilitate students' deeper and broader engagement with learning Italian.

BCC – Rigour

Rigour: Moderate

The BCC: SL for Grade 6 students learning Italian develops skills, understanding and knowledge that indicate a **moderate** degree of rigour. Cognitive demands include *listening, asking, responding, viewing, describing, recognising and interpreting*. Content Learning Standards are knowledge-based and require students to recognise and apply grammar, language systems, types of questions, verb conjugation, tense, and idiomatic language in new contexts. There is no explicit mention of students needing to evaluate or analyse the dynamic nature of Italian, although this appears to be implicit in the wording of the Big Ideas.

There is only one reference to *reflect on personal, shared, or others' experience of place* (Curricular Competency, Personal and Social awareness). It is logical to conclude that *using strategies to increase understanding* (Language Thinking Competency) would require understanding and reflecting on the use of language and register appropriate to time, place, context and audience. Elaborations in the BCC: SL resemble definitions or a glossary for the Learning Standards. They provide examples of knowledge or skills rather than demonstrating ways that teachers can engage students in deep learning and higher order thinking.

Comparative Analysis

The expectations of the AC: L and the BCC: L have much in common in relation to the skills, knowledge and understanding needed to establish sound foundations in learning in the early years of language acquisition. However, it is difficult to provide sound judgement on the comparative analysis of the two curricula due to the lack of alignment with entry points of commencement of study and age level of students.

In the AC: L Italian, Year 2 (F–2) students have completed three years of study of the language. They are learning the mechanics of writing, the relationship between sounds and pronunciation, aspects of language systems of Italian, rhythm and intonation, Italian phonemes, letter patterns, spelling, grammar and punctuation, while simultaneously becoming literate in the language of instruction in Australian schools, English.

Through the BCC: SL Italian, Grade 6 students have completed two years of studying Italian. They learn the systems of language of Italian and are expected to apply the skills acquired during seven years of schooling. It is assumed that the British Columbia student is already literate in Grade 5 when he or she commences the study of Italian. Therefore, the level of cognitive understanding and the possibility of deeper thinking about language acquisition is likely to be greater than that enabled through the study of Italian in the Year 2 AC: L.

In the AC: L Italian, Year 8 (Year 7 entry) students have completed two years of study of Italian. There is a closer alignment to the BC Grade 6 curriculum in terms of time allocation. However, the typical Australian student is 13 years old at the end of Year 8, compared to the British Columbia student who is 11 years of age. The age gap between the two represents a probable difference in the capacity for deeper thinking, reflection, analysis, and evaluation. This is evident in the expectations of the level of proficiency of skills, knowledge and understanding in the AC: L Content Descriptions and Achievement Standards: *they reflect on how culture is evident in experiences, images and texts; they understand and use metalanguage to explain aspects of language and culture; they analyse ... the interrelationship of language and culture. They reflect on how they interpret and respond to aspects of Italian language and culture, and to intercultural experience, and identify how their response may be shaped by their own language(s) and culture(s).*

Year/Grade Level

Australian Curriculum: Year 10 (Year 7 entry)

British Columbia Curriculum: Grade 10

Learning Area/Subject

Australian Curriculum: Languages (AC: L), Italian

British Columbia Curriculum: Second Languages (BCC: SL), Italian

Expectations: Knowledge and Skills

The AC: L expects students of Italian to develop specific skills, knowledge and understanding essential to learning a language in order to communicate with others and understand how the language is constructed. The underpinning philosophy is that learning Italian is integrated with a growing appreciation of the cultural context of the language, the communities in which Italian is spoken and their place in the world. Building on earlier skills acquired in band 7–8 (Year 7 entry), students build a range of strategies that can be applied to communicate effectively, acquire knowledge of systems of language and conventions of use, and understand the relationship of language and culture. Year 10 learners continue to develop proficiency in the skills essential to listening, speaking, reading, writing and interacting in a second language. They develop their skills and knowledge within appropriate topics using a range of texts. The AC: L expects Year 10 students to learn to interpret, create, evaluate and analyse a range of texts.

The BCC: SL Italian, Grade 10 uses the same structures which apply across the languages and grades of learning, based on a common framework rather than language specific curricula. It uses the Know-Do-Understand model of learning for all second language acquisition. The Content and Curricular Competencies of the Learning Standards represent what students are expected to know and to be able to do.

Grade 10 Italian is also guided by five Big Ideas which have developed conceptually from Grade 5 and ensure a developmental sequence of learning. The Core Competencies of Communication, Thinking and Personal and social competency which underpin all learning areas are the sub-categories of the language-specific curricular competencies. Grade 10 students are expected to understand that the Italian language – like all languages – is *inextricably bound with culture* and that *culture is a vehicle for acquiring a deeper understanding of a given language, of others, and of ourselves*. Students are expected to have acquired language-learning strategies for effective communication and to understand that language changes according to community, place, time and audience.

As is true of British Columbia's overall curriculum design, First Peoples perspectives are embedded explicitly in the Learning Standards of the Italian curriculum, *recognise First Peoples perspectives and knowledge, other ways of knowing and local cultural knowledge to gain understanding of Italian culture*. In British Columbia, Grade 10 Italian students are encouraged to *take risks and persevere in expressing themselves and engaging in conversation in a new language*. They are expected to *appreciate and value creative works and cultural diversity*.

In the AC: L and the BCC: SL, the strong interaction between language and culture is made explicit. The two curricula are on par in terms of the underlying philosophy that learning a second language gives students the opportunity to strengthen and acquire new skills, knowledge and a better understanding of one's own and other languages and cultures. The

view that language changes according to time, place and audience is evident in both curricula.

Measurement of Curriculum: Breadth, Depth and Rigour

Direct comparisons between the two Italian curricula in terms of breadth, depth and rigour are somewhat more problematic given that at the end of Year 10 (Year 7 entry) the Australian student will have studied the language for four years whilst the British Columbia student will have completed six years of study of the language by the end of Grade 10.

	BREADTH			DEPTH			RIGOUR		
	Limited	Fundamental	Comprehensive	Limited	Fundamental	Challenging	Limited	Moderate	Challenging
AC									
BCC									

AC – Breadth

Breadth: Comprehensive

For students in Year 10, the expectations of the AC: L Italian, Year 9–10 Band (Year 7 entry) are **comprehensive** in relation to breadth of coverage. The AC: L comprises the two inter-related strands of Communicating and Understanding, each containing sub-strands and a total of 19 content descriptions. The content focuses on the skills of communicating in Italian, as well as an understanding of the systems of the language, conventions of its use and the culture of the Italian language and Italian speaking communities. In the Communicating strand, there are 12 content descriptions under the sub-strands of socialising, informing, creating, translating and reflecting. Key concepts and key processes are identified for each content description. In the Understanding strand, there are seven content descriptions in the sub-strands of systems of language, language variation and change, and language and culture. The content descriptions reflect the key idea that developing the knowledge, understanding and skills to communicate effectively and the awareness of the relationship of language and culture shapes learning. Students are expected to demonstrate proficiency in the skills and content as described in the achievement standard.

Table 3.53 *Sub-strands of AC: L (Italian) including content descriptions, elaborations, key concepts and key processes, Year 10*

Sub-strand: Communicating	Year 10			
	Content Descriptions	Elaborations	Key Concepts	Key Processes & Key Text Types
Socialising	4	10	10	9
Informing	2	9	7	7
Creating	2	9	5	5 & 5
Translating	2	8	2	7
Reflecting	2	9	6	6
Sub-strand: Understanding	Year 10			
	Content Descriptions	Elaborations	Key Concepts	Key Processes
Systems of language	3	18		
Language variation and change	3	10		
Role of language and culture	1	6		
Total	19	79	30	39

BCC – Breadth

Breadth: Comprehensive

For students in Grade 10, the expectations of the BCC: SL Italian, Grade 10 are **comprehensive**. BCC's Second Languages content builds upon the content described for Grades 5 to 9 and uses the same structures to ensure a developmental sequence of learning is articulated. There are five Big Ideas, seven Content descriptions and the same three Curricular Competencies of Language Thinking, Communication, and Personal and Social Awareness as in previous grades. Within these learning standards, there are a further 14 statements that further explicate Curricular Competencies and seven which support the Content. Both Big Ideas and Competencies have Elaborations to further define the knowledge and skills required. The learning standards represent a wide scope of interconnected components essential to language acquisition: reading, writing, listening, speaking, interacting, knowledge of grammar and the purposeful use of language. In the BCC: SL Italian, Grade 10, the idea that language acquisition is closely connected with culture underpins the approach to acquisition of a second language.

Table 3.54 *Content statements in BCC: SL (Italian), Grade 10*

Learning Standards	Big Ideas	Curricular Competencies			Content
		Language Thinking	Communication	Personal and Social Awareness	
	5	4	3	7	7
Elaborations	2	26			

AC – Depth

Depth: Challenging

The expectations of the AC: L Italian, Year 9–10 Band (Year 7 entry), are **challenging** in relation to depth of coverage of topics, skills and knowledge. The Content Descriptions in the AC: L expect students to demonstrate skills beyond recall and memorisation. Students learn to manipulate knowledge and skills in unfamiliar situations and to connect learning between the strands, sub-strands and threads, applying their understanding in a range of contexts. They are expected to demonstrate a deep understanding of the underpinning concept that effective communication, language and culture are closely interrelated. The Content Descriptions require higher-order thinking in interpreting, creating and exchanging information and ideas. Depth of understanding and sophistication of knowledge and skills are also evident in the Achievement Standards when students demonstrate they are able to *reflect on ways in which language and culture together create meanings, and on ways in which their own linguistic and cultural assumptions come into play in using and learning Italian and demonstrate understanding of the role of language and culture in shaping experience, and the ways in which their own past experiences shape their identity.*

BCC – Depth

Depth: Fundamental

Based on the coverage of topics, skills and knowledge in the curriculum, the expectations of BCC: SL Italian course in Grade 10 are assessed as **fundamental**. As is true for all learning areas, the BCC bases the study of this language on the know-do-understand model of learning. Opportunities for deeper thinking and learning are provided through the Big Ideas and Curricular Competencies of Language Thinking, Communication and Personal and Social Awareness. Students are expected to *recognise, locate, explore, narrate, engage, express, appreciate, value, access, interact*. However, there is no explicit direction to incorporate higher-order skills such as analysing, synthesising, evaluating, or reflecting. In one of the exemplifications under Language Thinking, students are expected to be able to *use a growing number of strategies to derive and negotiate meaning*; this could be a way to demonstrate deep understanding and application of knowledge. In the Curricular Competencies - Elaborations this is defined as:

- circumlocution, paraphrasing, reformulation, reiteration, repetition, word substitution
- interpreting body language, contextual cues, expression, and tone
- using contextual cues
- interpreting familiar words.

The elaborations offered in Grade 10 Italian appear to function as a definition and/or glossary to explain the *use of a growing number of strategies to derive and negotiate meaning* rather than indicating the depth of the skills and capabilities required. Deeper thinking is implicit in the Communication, Thinking and Personal and Social Competency, but these are not made explicit in BCC: SL Italian, Grade 10.

AC – Rigour

Rigour: Challenging

The AC: L Italian, Year 9–10 Band (Year 7 entry), indicates a **challenging** degree of rigour. The terminology in the content descriptions demonstrates that students are expected to develop skills and understanding through a range of key processes such as *exchanging, debating, comparing, negotiating, applying, creating, connecting, translating, interconnecting, reflecting, evaluating and analysing*. Students are expected to develop skills, knowledge and understanding that go beyond recalling and recognising learned concepts and principles.

Elaborations provide additional suggestions designed to extend students' proficiency and to engage them in more abstract thinking and reasoning. This is seen in the choice of verbs and phrases such as *deducing meaning, evaluating and synthesising information and identifying cultural references in texts that show different representations of Italian culture, decentering from their own primary linguistic and cultural world to reflect*. Elaborations also provide suggestions for teacher action that encourage multiple approaches, strategies and solutions to help facilitate students' deeper and broader engagement with the Italian language.

The expected learning involves considering diverse perspectives, analysing and challenging assumptions, reflecting on language and intercultural exchanges, analysing the features of a range of texts and creating authentic texts. Students are given multiple opportunities to apply capabilities, strategies and knowledge to new contexts. This involves the ability to manipulate the language appropriately to suit time, place and audience and apply critical and creative skills to solve problems and find solutions in unfamiliar contexts.

The AC: L Italian, Year 9–10 Band (Year 7 entry), provides students with many opportunities for cognitive and intellectual challenge. The knowledge and skills expected in the content descriptions and achievement standards after four years of second language learning and acquisition are consistently challenging.

BCC – Rigour

Rigour: Moderate

The BCC: SL Italian develops skills, knowledge and understanding through six Big Ideas and a range of Curricular Competencies and Content within the Learning Standards, assessed as a **moderate** degree of rigour.

Content Learning Standards are knowledge-based and require students to recognise and apply grammar, language systems, types of questions, verb conjugation, tense, and idiomatic language in new contexts. There is no explicit mention of students needing to analyse, evaluate or reflect on the dynamic nature of Italian although one could conclude that this is implicit in the wording of the Big Ideas. For example, these encourage students to appreciate that study of the language *strengthens our understanding and acquisition of a new language and expressing ourselves...in a new language requires courage, risk taking, and perseverance*.

The content is presented as a framework with limited language-specific content. This is also true of the Curricular Competencies where the skills required *to do* are generic skills applied to second language learning and acquisition in general.

There is some demand for critical and creative thinking in the Curricular Competencies of Language Thinking and Personal and Social Awareness. This could be interpreted to mean that to *use a growing number of strategies to derive and negotiate meaning* would require understanding and reflecting on the use of language and register appropriate to time, place, context and audience.

Elaborations in the BCC: SL definitions or a glossary for the curricular competencies. They provide examples of knowledge or skills rather than demonstrating ways that teachers can engage students in deep learning and higher-order thinking.

Comparative Analysis

The AC: L Italian, Year 9-10 (Year 7 entry), has been chosen as an exemplar for comparative analysis with BCC: SL Italian, Grade 10. At the end of Grade 10, the British Columbia student will have been studying the language for six years in comparison to the four years undertaken by the student learning through the AC. Again, the different starting points and numbers of years studying the language make a direct comparison of the curriculum less straightforward.

The AC: L Italian, Year 9–10 Band (Year 7 entry) and Grade 10 of the BCC: SL Italian, are largely comparable in terms of breadth. Although the AC: L has more detail in relation to content than the BCC material, the targeted skills, knowledge and understanding are developmentally comparable. The BCC has less prescriptive content focus while allowing for flexibility in the creation and delivery of learning experiences and deeper exploration of content through elaborations.

Both curricula organise content, skills, knowledge and understanding around developing skills and strategies for effective communicating, appreciation of the systems of the Italian language and the conventions of its use and the strong interconnection between language and culture, the Italian speaking communities and the global community. An example from each curriculum is as follows:

- Reflect on intercultural exchanges and the ways in which language is used to establish relationships, indicate social values and enhance reciprocity (AC: ACLITU133)
- Recognise how cultural identity is expressed....in Italian, and
- Express and reflect on a variety of experiences, perspectives, and worldviews.... (BCC: Curricular Competencies Personal and Social Awareness).

Both curricula emphasise the importance of engaging with a variety of texts (oral, written, visual and multimodal) to gain proficiency in the Italian language and to facilitate understanding of *the dynamic nature of Italian (and languages in general) recognising the impact of technology, media and intercultural contact (ACLITU131) ... to appreciate and value creative works and cultural diversity* (BCC: Big Ideas).

There are some points of difference between the two curricula in relation to depth and rigor. In the AC: L, the content descriptions specify what students will learn and the achievement standards illustrate the depth of understanding and sophistication of knowledge and skills required at the end of each band level. Furthermore, the content elaborations (optional) are provided to give teachers direction as to the depth of treatment needed for the content, skills and knowledge. Prescriptive detail and information around the key concepts and key processes to be taught for the Year 9-10 Band provide opportunities for cognitive and intellectual challenge. Students are required to demonstrate the ability to manipulate knowledge and skills to unfamiliar situations when they participate in spoken and written transactions, including obtaining and negotiating different services and problem-solving (ACLITC117).

The depth of understanding and expected sophistication of knowledge and skills are also evident in the Achievement Standards of the AC: L when students demonstrate they can *use a range of everyday language both orally and in writing to exchange information about their personal, social, local and about broader issues of personal significance and plan what needs to be communicated to particular audiences and consider different perspectives and identify social and cultural practices of Italians in Italy and in the diaspora, including communities in Australia.*

In the BCC, in keeping with the overall curriculum design, the depth and rigor required in the topics, skills, knowledge and understanding encountered in the curriculum are neither prescribed nor explicit. The content is presented as a framework with limited Italian language-specific content. This is also true of the Curricular Competencies where the skills required *to do* are generic skills applied to second language learning and acquisition in general.

Depth of coverage is implicit in the Learning Areas and elaborations but is left to the teachers' interpretation of the curriculum and pedagogy and methodology. Students are expected to *recognise, locate, explore, narrate, engage, express, appreciate, value, access, interact* (Curricular Competencies) but there is no explicit direction to incorporate higher order skills such as analysing, synthesising, evaluating, reflecting. In order to fulfil the expectations and cognitive demands of the Big Ideas, there would need to be in-depth coverage of the content and curricular competencies and rigorous *demand on students' ability to engage in abstract thinking and reasoning....application of critical, creative and collaborative skills to solve problems and apply solutions to the real world.*

Cumulative comparison of curriculum

The BCC: SL is a framework for all second languages rather than a language-specific curriculum, albeit that each curriculum contains language-specific examples provided to exemplify knowledge, skills and understandings in the Learning Standards and Elaborations. In this way, the BCC engenders *mastery learning across the years of schooling in a coherent and consequential manner* in the development of the Big Idea from Grade 5 to Grade 10. This can be seen in the progression of the Big Ideas in the following example:

Grade 5 - *With basic language skills we can describe ourselves.*
Grade 6 - *With basic language skills we can describe important people in our lives.*
Grade 7- *With basic language skills we can discuss our interests.*
Grade 8 - *We can express ourselves and talk about the world around us in a new language.*
Grade 9 - *Acquiring another language provides opportunities to explore our own cultural identity from a new perspective.*
Grade 10 - *Acquiring a language can shape our perspective and identity and Expressing ourselves and engaging in conversation in a new language requires courage, risk taking and perseverance.*

By comparison, the AC: L has language-specific curricula because the design recognises the features that languages share as well as those that make each unique. The philosophical basis for this is that “the curriculum content and achievement standards are different for each specific language because of inherent differences in the languages themselves and each language has its own distinctive structure, systems, conventions for use, related culture(s), place in the Australian and international communities, as well as its own history in Australian education” (AC: L, Introduction to Languages learning area).

Distinctive differences also exist in the emphasis placed on First Peoples knowledge and perspectives. In the BCC, this material is embedded in each of the disciplines, including languages. For example, it is stated that “First Peoples Principles of Learning greatly influence the Italian curriculum They lend themselves well to second-language learning, as they promote experiential and reflexive learning, as well as self-advocacy and personal responsibility in learners” (BCC: Introduction to Italian). This focus is explicit in the content of the Learning Standards in *the First Peoples perspectives connecting language and culture (oral histories, identity, place)* and in the curricular competency *Personal and Social Awareness, Recognise First Peoples perspectives and knowledge, other ways of knowing, and local cultural knowledge to gain understanding of the Italian Culture.*

The AC acknowledges the first peoples of Australia through the Cross-Curriculum Priority of Aboriginal and Torres Strait Islander Histories and Cultures, but the Italian Band 9–10 contains just one reference in one content description: *Compare and contrast aspects of communication and the relationship among languages used in the ecology of languages in Australia, including Aboriginal languages and Torres Strait Islander Languages, Asian languages and world languages.*

In the AC: L, authentic and meaningful connections are made with the other two dimensions of the AC. The icons for the seven General Capabilities and the three Cross-Curriculum Priorities provided in the sub-strands are a guide for teachers and enhance the work of the languages curriculum for students.

Similarly, the BCC: SL has an integrated approach between the Big Ideas, Content and Curricular Competencies, and language thinking, communication, and personal and social awareness.

In both curricula, there is an emphasis on an integrated and interconnected set of knowledge, skills, behaviours and dispositions.

The AC: L and the BCC: SL both acknowledge the importance of the role of language and culture in communication and learning, as follows:

- The interrelationship of language, culture and learning provides the foundation for the Australian Curriculum: Languages. And In the languages learning area the focus is on both language and culture, as students learn to communicate meaningfully across linguistic and cultural systems, and different contexts (AC: Key Ideas).
- Language is inextricably bound to culture. Culture is a vehicle for acquiring a deeper understanding of a given language, of others, and of ourselves. Authentic communication always takes place in a cultural context Contributing to their appreciation of other cultures as well as their own (BCC: Introduction to Italian).

The strong connections between language and culture are clearly stated in British Columbia's Big Ideas (*acquiring a language can shape our perspective and identity and appreciate and value creative works and cultural diversity and access and interact with diverse communities*) and are evident in the Personal and Social Awareness curricular competency.

The AC: L dictates neither pedagogy nor teaching methodology. This is different from the guidance given in the introduction to the Italian material in BCC: SL which states that *it is important that it be used as the language of instruction for the Italian curriculum.... research shows that increasing exposure to and use of the target language is essential to increasing proficiency.*

There is evidence that the AC: L and the BCC: SL are driven by the vision that learners need to have the skills, capabilities and knowledge to live and thrive in their community and take on the challenges of an information-rich, globalised world in the 21st century. They encourage students to apply the particular skills and knowledge they have acquired in communicating in a second language. Both curricula acknowledge the strong connection between language and culture and the capacity of these to shape identity.

i) General Capabilities

Comparative Curricula

Australian Curriculum: General Capabilities

British Columbia Curriculum: Core Competencies

Year/Grade Level

Australian Curriculum: Year 2

British Columbia Curriculum: Grade 2

Learning Area/Subject

Australian Curriculum: General Capabilities (AC: GC)

British Columbia Curriculum: Core Competencies (BCC: CC)

Expectations: Knowledge and Skills

The AC identifies seven capabilities that play a significant role *in equipping young Australians to live and work successfully in the twenty-first century* (ACARA, 2017c).

The AC: GC include:

- Literacy
- Numeracy
- Critical and Creative Thinking
- ICT Capability
- Personal and Social Capability
- Ethical Understanding
- Intercultural Understanding

Each capability is organised into elements and sub-elements within continua that focus on the specific skills and attributes learners should develop as they progress through their schooling. The continua establish expectations of learning at the end of Foundation, Year 2, Year 4, Year 6, and Year 10. At Year 2, the General Capabilities describe the beginning or lower levels of skill development expected from students.

The General Capabilities are presented as learning continua or sequences that describe the knowledge, skills, behaviours and dispositions that students can reasonably be expected to have developed by the end of particular years of schooling. (ACARA, 2017c)

BCC: CC are defined as *the intellectual, personal and social skills that all students need to develop for success in life beyond school* (BCME, 2017a). The BCC: CC are further described as *sets of intellectual, personal, and social and emotional proficiencies that all students need to develop in order to engage in deep learning and life-long learning* (BCME, 2017d).

The BCC identifies three Core Competencies:

- Communication Competency
- Thinking Competency
- Personal and Social Competency

Thinking and Personal and Social competencies have been organised into separate profiles which focus on specific competencies and attitudes. The profiles describe learning across a range of levels which are not attributed to ages or stages of schooling. These are designed to be used by students as a self-assessment tool.

The General Capabilities and the Core Competencies are not aligned in all respects. The table below compares the two jurisdictions.

Table 3.55 *Comparison of General Capabilities and Core Competencies in AC and BCC*

Australian Curriculum	British Columbia Curriculum
Personal and Social Capability	Positive Personal and Cultural Identity Personal Awareness and Responsibility Social Awareness Communication Competency
Critical and Creative Thinking	Thinking Competency
Literacy	N/A
Numeracy	N/A
ICT Capability	N/A
Intercultural Understanding	Positive Personal and Cultural Identity
Ethical Understanding	N/A

The General Capabilities comprise continua that describe learning expectations at the end of every *second* year of schooling from Foundation to Year 10.

Learning continua have been developed for each capability to describe the relevant knowledge, skills, behaviours and dispositions at particular points of schooling. Within each of the capabilities, specific behaviours and dispositions have been identified and incorporated into each learning continuum as appropriate. (ACARA, 2017c)

The Core Competencies profiles are a series of ‘1’ statements which students use as part of a self-assessment process at the end of each year of schooling.

The set of profiles are descriptions of students as they progress to sophisticated stages of competency. The profiles are written from the student’s point of view, reflecting student ownership and responsibility for demonstrating the competencies. (BCME, 2017e)

The General Capabilities and the Core Competencies do not align at year levels, so comparisons have been made at the following points:

Table 3.56 *Comparison points of AC continuum and BCC profiles*

Australian Curriculum Continuum	British Columbia Profiles
By the end of Year 2	Level 1 and Level 2
By the end of Year 6	Middle levels - dependent on number of levels within a profile
By the end of Year 10	Final level of profiles

Measurement of Curriculum: Breadth, Depth and Rigour

	BREADTH			DEPTH			RIGOUR		
	Limited	Fundamental	Comprehensive	Limited	Fundamental	Challenging	Limited	Moderate	Challenging
AC									
BCC									

AC – Breadth

Breadth: Comprehensive

The AC: GC are considered **comprehensive** at Year 2 due to the volume of capabilities and attributes they encompass. The General Capabilities continua describe 85 different indicators that learners are expected to demonstrate prior to the end of Year 2. Many of these are linked to each other and build upon the expectations established in the preceding levels.

Table 3.57 *Number of General Capabilities in AC, Year 2*

Australian Curriculum: General Capabilities	Number of capabilities
Critical and Creative Thinking	12
Personal and Social Capability	16
Information Communication Technology Capability	9
Intercultural Understanding	9
Ethical Understanding	8
Numeracy	12
Literacy	14

Three of the capabilities have close alignment with established learning areas. Many of the capabilities described within the Personal and Social Capability have related or similar skills described within the Health and Physical Education learning area. Capabilities described within the Numeracy continua are closely aligned to the content and proficiencies of the AC: M, and the capabilities described within the Literacy continua are closely aligned to content and processes described in the AC: E. Additionally, capabilities described within the ICT Capability have some alignment with the AC: DT, with six of the nine capabilities aligned with its content descriptions.

BCC – Breadth

Breadth: Fundamental

The BCC: CC are considered **fundamental** at Levels 1 and 2 as they establish a range of competencies to be addressed and developed by the learner in the initial years of schooling. The Core Competencies describe 52 different competencies that learners are exposed to by the end of Level 2.

Table 3.58 *Number of Core Competencies in BCC, Level 2*

British Columbia: Core Competencies	Number of competencies
Critical Thinking Level 1	3
Critical Thinking Level 2	5
Creative Thinking Level 1	4
Creative Thinking Level 2	4
Positive Personal and Cultural Identity Level 1	3
Positive Personal and Cultural Identity Level 2	6
Personal Awareness and Responsibility Level 1	3
Personal Awareness and Responsibility Level 2	5
Social Responsibility Level 1	3
Social Responsibility Level 2	9
Communication Level 1	2
Communication Level 2	5

AC – Depth

Depth: Fundamental

For Year 2 students, the AC: GC are considered **fundamental**. At this level, the capabilities primarily focus on identification, discussion and description. Students make some decisions about learning in familiar situations and begin to demonstrate the ability to discuss a variety of capability-related concepts. The General Capabilities are a progression of learning and this level establishes capabilities at a basic level which do not require higher-order thinking skills for students to be successful.

With consideration of Webb’s Depth of Knowledge, the General Capabilities at Year 2 typically engage students in activities and develop their capability in *describing*, *identifying*, and *comparing* as they begin to make decisions about their learning.

BCC – Depth

Depth: Fundamental

The BCC: CC at Levels 1 and 2 are regarded as **fundamental**. By the end of Level 2, the Core Competencies focus on self-identification of some competencies and working in supported environments and situations to complete tasks. The profiles focus on students developing competencies such as exploring, questioning, making, identifying and explaining. The profiles are a progression of learning at this level; they establish and describe competencies which do not require higher-order thinking skills to accomplish or achieve particular objectives.

Based on Webb’s Depth of Knowledge, the Core Competencies at Levels 1 and 2 typically engage students in activities and develop their skills in *exploring*, *identifying*, *describing* and *planning* in familiar environments.

AC – Rigour

Rigour: Moderate

The AC: GC at Year 2 are considered **moderate** in relation to rigour. The capabilities are designed to promote flexible thinking, engage learners with peers, develop understanding of others, and encourage learners to *question, describe, discuss* and *predict*.

As the General Capabilities are developmental in nature, the learning is considered **moderate** at Year 2 and the capabilities and dispositions increase in complexity as students move through the stages of schooling.

BCC – Rigour

Rigour: Moderate

The BCC: CC at Levels 1 and 2 are considered **moderate**. The BCC: CC profiles are developmental in nature and these levels describe the behaviours expected at the beginning stages of competency development. As a student progresses through the compulsory years of schooling, the descriptions of competencies within the profiles become increasingly more complex. In these introductory levels, the competencies and dispositions are considered to be **moderate** in terms of rigour, largely as they form the basis for further learning.

Year/Grade Level

Australian Curriculum: F – Year 6

British Columbia Curriculum: K – Grade 6

Learning Area/Subject

Australian Curriculum: General Capabilities (AC: GC)

British Columbia Curriculum: Core Competencies (BCC: CC)

Expectations: Knowledge and Skills

Please refer to the description provided in the earlier section on Year 2 for an explanation of the structure and purpose of the AC: General Capabilities and the BCC: CC.

Measurement of Curriculum: Breadth, Depth and Rigour

	BREADTH			DEPTH			RIGOUR		
	Limited	Fundamental	Comprehensive	Limited	Fundamental	Challenging	Limited	Moderate	Challenging
AC									
BCC									

AC – Breadth

Breadth: Comprehensive

The AC: GC are **comprehensive** in their breadth. As with Year 2, there are 85 capabilities described for learners to demonstrate by the end of Year 6.

Table 3.59 *Number of General Capabilities in AC, Year 6*

Australian Curriculum: General Capabilities	Number of capabilities
Critical and Creative Thinking	12
Personal and Social Capability	16
Information Communication Technology Capability	9
Intercultural Understanding	9
Ethical Understanding	8
Numeracy	12
Literacy	14

BCC – Breadth

Breadth: Comprehensive

The BCC: CC are **comprehensive** in their breadth. Within the mid-levels of the profiles, 78 examples of behaviour and dispositions are described for learners to consider.

Table 3.60 *Number of Core Competencies in BCC, to Level 6*

British Columbia: Core Competencies	Number of competencies
Critical Thinking Level 4	5
Critical Thinking Level 5	9
Creative Thinking Level 3	4
Creative Thinking Level 4	4
Positive Personal and Cultural Identity Level 3	6
Positive Personal and Cultural Identity Level 4	5
Personal Awareness and Responsibility Level 3	6
Personal Awareness and Responsibility Level 4	8
Social Responsibility Level 3	10
Social Responsibility Level 4	8
Communication Level 5	7
Communication Level 6	6

AC – Depth

Depth: Fundamental

At Year 6, the AC: GC require students to continue to identify and discuss some sub-elements within each capability, work that emphasises analysis and evaluation. Whilst these capabilities are of a higher order, they are not broadly applied across the capabilities and therefore the capabilities for depth are deemed **fundamental**.

The verbs, describing actions students would undertake by the end of Year 6, still focus largely on lower-order skills such as identify, describe, discuss and use, with the inclusion of some higher-order skills such as analyse, assess, compare and explain. On balance, the actions described within the General Capabilities at Year 6 are of a lower order, as

evidenced in the table below which provides a count of the verbs used to describe learning expectations for students completing Year 6.

Table 3.61 *Australian Curriculum: General Capabilities for Year 6 (verbs)*

Verb	Count	Verb	Count	Verb	Count	Verb	Count	Verb	Count
analyse	3	classify	1	condense	1	describe	9	explain	11
apply	2	collect	1	consider	1	devise	1	explore	2
articulate	1	combine	2	contribute	1	discuss	4	formulate	1
assess	4	compare	5	convert	1	edit	1	generate	2
choose	1	compose	2	create	2	evaluate	2	identify	20
clarify	2	comprehend	1	deliver	1	examine	2	interpret	2
interpret	1	modify	1	prepare	1	respond	1	suggest	1
justify	1	monitor	2	probe	1	retrieve	1	test	2
listen	1	navigate	1	read	1	scrutinise	1	understand	1
locate	1	plan	1	reflect	1	seek	1	use	11
maintain	1	pose	1	rehearse	1	select	1	view	1
manage	1	practise	1	research	1	solve	2		
<p>Verbs in red reflect higher-order expectations for this age group. Verbs in green reflect lower-order expectations for this age group.</p>									

BCC – Depth

Depth: Fundamental

Within the mid-levels of the BCC: CC, the depth of knowledge and understanding moves from identifying and describing to more sophisticated expectations such as synthesising, evaluating, clarifying and advocating. The Core Competencies have been categorised as **fundamental** at this level because there is an increase in the level of complexity, but the descriptions generally describe lower-order thinking skills.

The verbs chosen to describe the action expected of students in the mid-range profiles focus largely on lower-order competencies such as identify, use, gather and recognise, with the inclusion of some higher-order competencies such as *consider, evaluate and build*. On balance, the actions described within the BCC: CC at these levels are of a lower order.

Table 3.62 Core Competencies at mid-levels in BCC

Verb	Count	Verb	Count	Verb	Count	Verb	Count	Verb	Count
accept	1	consider	4	generate	2	represent	1	reassess	1
adapt	1	contribute	1	get	3	respect	1	recognise	2
adjust	2	demonstrate	2	identify	8	risks	1	flexible	1
advocate	2	describe	2	imagine	1	select	1	gather	2
ask	1	develop	2	implement	1	set	2	clarify	1
assess	2	engage	1	interact	1	show	1	combine	1
aware	1	evaluate	3	maintain	1	synthesise	1		
build	3	examine	2	make	1	tell	1		
check	1	explain	3	monitor	1	understand	3		
choose	1	explore	1	persevere	1	use	4		

Verbs in **red** reflect higher-order expectations for this age group.
 Verbs in **green** reflect lower-order expectations for this age group.

AC – Rigour

Rigour: Moderate

The AC: GC are deemed to be **moderate** in their level of rigour. All capabilities build on those described for learning at the end of Year 4 and are designed to prepare students for learning at other stages of schooling.

For example, if the Pose Questions sub-element of Critical and Creative thinking is considered over time, students move from posing exploratory questions based on what they can observe to posing questions for the purpose of critically analysing abstract ideas.

Table 3.63 Continuum for Critical and Creative Thinking in AC, Level 1 – Level 6

Sub-element	Level 1 Typically, by the end of Foundation Year, students:	Level 2 Typically, by the end of Year 2, students:	Level 3 Typically, by the end of Year 4, students:	Level 4 Typically, by the end of Year 6, students:	Level 5 Typically, by the end of Year 8, students:	Level 6 Typically, by the end of Year 10, students:
Pose questions	pose factual and exploratory questions based on personal interests and experiences	pose questions to identify and clarify issues, and compare information in their world	pose questions to expand their knowledge about the world	pose questions to clarify and interpret information and probe for causes and consequences	pose questions to probe assumptions and investigate complex issues	pose questions to critically analyse complex issues and abstract ideas

BCC – Rigour

Rigour: Moderate

The BCC: CC are deemed to have a **moderate** level of rigour. The table below outlines the progression of learning through the Communication Competency in relation to the focus skill of communicating. All of the competencies build on those described for learning at the

previous level. For example, if the skill of communicating is considered over time, students move from demonstrating the ability to respond meaningfully in safe and supported environments to communicating intentionally and strategically to a range of audiences to achieve a goal.

Table 3.64 Profiles for communication, BCC

	Profile 1	Profile 2	Profile 3	Profile 4
Skill	In a safe and supported environment, I respond meaningfully to communication from peers and adults	In familiar situations, with direct support, I communicate with peers and adults	In familiar situations, with some support or guidance, I communicate with peers and adults.	I communicate with peers and adults with growing confidence, using forms and strategies I have practiced
	Profile 5	Profile 6	Profile 7	Profile 8
	I communicate clearly, in an organised way, using a variety of forms appropriately	I communicate confidently in organised forms that show attention to my audience and purpose.	I communicate effectively in well-constructed forms that are effective in terms of my audience and purpose.	I am intentional and strategic; I am able to engage and accomplish my purpose with an increasing range of audiences, including those I do not know

Based on and includes information from the following source: Source: Information from BC Ministry of Education: *Communication Competencies Profiles: Draft*.

Year/Grade Level

Australian Curriculum: Year 10

British Columbia Curriculum: Grade 10

Learning Area/Subject

Australian Curriculum: General Capabilities (AC: GC)

British Columbia Curriculum: Core Competencies (BCC: CC)

Expectations: Knowledge and Skills

Refer to the description provided in the section on Year 2 / Grade 2 for an explanation of the structure and purpose of the AC: GC and the BCC: CC.

Measurement of Curriculum: Breadth, Depth and Rigour

	BREADTH			DEPTH			RIGOUR		
	Limited	Fundamental	Comprehensive	Limited	Fundamental	Challenging	Limited	Moderate	Challenging
AC									
BCC									

AC – Breadth

Breadth: Challenging

The AC: GC are considered to be **challenging** at Year 10 level. There are 85 capabilities described in the continua of learning across seven capabilities.

Table 3.65 *Number of General Capabilities in AC at different levels*

Australian Curriculum: General Capabilities	Number of capabilities
Critical and Creative Thinking	12
Personal and Social Capability	16
Information Communication Technology Capability	9
Intercultural Understanding	9
Ethical Understanding	8
Numeracy	12
Literacy	14

BCC – Breadth

Breadth: Fundamental

The BCC: CC are considered **fundamental** at the final levels of the profiles. There are 42 competencies and dispositions described in the final levels of the Core Competencies.

Table 3.66 *Number of Core Competencies in BCC at different levels*

British Curriculum: Core Competencies	Number of competencies
Critical Thinking Level 6	8
Creative Thinking Level 5	6
Positive Personal and Cultural Identity Level 5	7
Personal Awareness and Responsibility Level 5	8
Social Responsibility Level 5	7
Communication Level 8	7

AC – Depth

Depth: Challenging

The AC: GC are regarded as **challenging** in depth for Year 10, especially as they require students to use higher-order thinking skills such as analysis, justification and evaluation in increasingly diverse and complex situations. The capabilities described within the final level of each continua establish high expectations for the development of sophisticated capabilities that are transferable across learning areas.

BCC – Depth

Depth: Challenging

The final levels of the BCC: CC are **challenging** in depth as they require students to identify a range of competencies and attitudes across a range of situations with developing complexity. There is also a future-focused descriptive component where students identify skills that will develop over time.

AC – Rigour

Rigour: Challenging

As the final point on a developmental continuum of learning, the expectations at this level are considered to be **challenging** as they require students to demonstrate or develop a sophisticated range of capabilities and dispositions in a variety of local and global contexts.

BCC – Rigour

Rigour: Challenging

At this final point on a developmental continuum of learning, the BCC: CC are regarded as **challenging**. They require students to demonstrate or develop a sophisticated range of competencies and dispositions and to plan for future growth in their learning.

Comparative Analysis

The AC: GC and the BCC: CC both strive to provide a framework for young people to develop skills, dispositions and aptitudes necessary for post-school navigation of an uncertain world. Both frameworks focus on the development of inter- and intra-personal skills as well as critical and creative thinking skills.

The BCC: CC focus on developing communication skills. These are not an explicit capability within the AC, although the skills are developed in various ways within all capabilities.

The AC: GC include continua of learning that address skill development in the areas of Ethical Understanding, Intercultural Understanding, Literacy, Numeracy and ICT Capability. These skills are not developed to the same extent within the BCC.

Both curricula rely heavily on the capacity of classroom teachers to ensure students engage in learning activities that enable them to develop the skills and dispositions required to be successful learners in the future.

Year 2

The AC: GC and the BCC: CC both place a strong emphasis on *identifying, using and describing* at this level. This is appropriate at this level since the continua and profiles describe the basic or foundational development of capabilities and competencies which students require to progress through the levels in the later years of schooling.

An obvious contrast between the two curricula is seen in the language used to express the dispositions. The language used in the BCC is less complex than the language used in the AC. Importantly, the BCC uses the first person, placing the student at the centre of the activity and ensuring a strong sense of agency and accountability.

This is seen, for example, in the following competency:

*I can identify people, places, and things that are important to me.
I can identify some of my individual characteristics.
I can explain what I like and dislike. (BCME, 2017f)*

The AC describes the same concept in the following way, using a series of statements that begin with the key verbs depicting the action to be taken:

Recognise personal qualities and achievements - identify and describe personal interests, skills and achievements and explain how these contribute to family and school life. (ACARA, 2017d)

The language used in the BCC: CC makes them more accessible for students and parents in comparison to the style adopted by the AC: GC. The language of the AC: GC is dense and, in some cases, quite technical, for example, *Understand computer mediated communications* (ACARA, 2017e). This use of language persists across all levels and profiles within the AC: GC and within the BCC: CC.

Year 6

At Year 6 level, the AC: GC and BCC: CC are similar in content and concept development for the areas of alignment.

The BCC: CC are organised into a developmental profile of learning against a range of levels. The levels are not established against year levels or age groups but are designed to allow educators to personalise learning and for students to set their own goals and learning objectives in relation to the profiles. No year-level expectations are placed on the profile levels.

The AC: GC have been developed as progressions of learning. Each capability has a continuum of learning which sets out typical learning expectations at the end of Foundation, Year 2, Year 4, Year 6, Year 8 and Year 10. The learning goals at the end of each two-year cycle are explicitly stated within the continua and describe what a student at that year level may typically demonstrate in relation to the nominated skills. Additional levels have been developed within the Literacy, Numeracy and Personal and Social Capabilities to enable educators to differentiate instruction for students with diverse learning needs.

Comparison of the General Capabilities and the Core Competencies at Year 6 level is problematic as AC: GC are set against a year level but the BCC: CC are not. The BCC: CC profiles vary in the number of levels described in each competency, with some competencies having eight levels and some having five. Therefore, the selection of 'mid-levels' means selecting a range of levels across the competencies.

Year 10

At this final level, the BCC: CC and the AC: GC both identify higher-order thinking skills and sophisticated behaviours. The BCC: CC are written for the student and constitute a self-assessment tool that is purposely built on a progression of learning. The AC: GC are written for the teacher as a guide to support student learning. In essence, the nature of the curricula differs, but the purpose remains the same.

At this level, the AC: GC and the BCC: CC are both aspirational and establish high levels of achievement for students to attain.

Additional Observations

British Columbia's Core Competencies profiles are written as statements, written from the student's point of view and reflecting student ownership and responsibility for demonstrating the competencies.

The British Columbia Ministry of Education is in the process of identifying strategies for supporting student self-assessment and for assisting teachers to report on the Core Competencies. The Core Competencies also have a separate role as a vehicle for self-assessment to be used by students in meeting the requirements of the Student Progress Report Order. As part of the School Act, all students in Kindergarten to Year 9 are required to complete a self-assessment on the Core Competencies; this is part of the legislated reporting requirements for the province and these self-assessments form part of the annual reporting cycle provided to parents (BCME, 2017g).

No resources have been developed for the assessment of the AC: GC; this is deemed to be the responsibility of states and territories as they implement the AC. Within states and territories, numerous approaches are being considered to assess and report to parents on student attainment in the General Capabilities.

The description of discipline-specific skills within each learning area is also considered an important element of comparison between the two curricula. The BCC: CC are associated with the British Columbia Curricular Competencies described within learning areas. The Curricular Competencies are discipline-specific skills that are clearly described at each year level within each learning area.

j) Cross-Curriculum Priority: Aboriginal and Torres Strait Islander Histories and Cultures

Comparative Curricula

Australian Curriculum: Cross-Curriculum Priority: Aboriginal and Torres Strait Islander Histories and Cultures

British Columbia Curriculum: Aboriginal Education

Year/Grade Level

AC: Foundation – Year 10

BCC: Kindergarten – Grade 10

Learning Area/Subject

Australian Curriculum: Cross-Curriculum Priority (AC: CCP): Aboriginal and Torres Strait Islander Histories and Cultures

British Columbia Curriculum: Aboriginal Education (BCC: Aboriginal Education)

Expectations: Knowledge and Skills

In the AC, the focus on Aboriginal and Torres Strait Islander Histories and Cultures is presented as a Cross-Curriculum Priority (CCP) – one of three priorities – that is to be taught through all learning areas, where relevant, and seeks to develop cultural and intercultural awareness / responsiveness in all students.

The AC states that the three Cross-Curriculum Priorities:

...are only addressed through learning areas and do not constitute curriculum on their own, as they do not exist outside of learning areas. Instead, the priorities are identified wherever they are developed or have been applied in content descriptions. They are also identified where they offer opportunities to add depth and richness to student learning in content elaborations. They will have a strong but varying presence depending on their relevance to the learning area.

Key Ideas describe the three key concepts of Country/Place, Culture and People; these are supported by their nine Organising Ideas. Within the learning areas, Content Descriptions and Elaborations highlight the requirement and suggestions for the priority's inclusion in the curriculum. References to Aboriginal and Torres Strait Islander Histories and Cultures are found in the learning areas of the Humanities and Social Sciences, Languages and The Arts.

In the Science curriculum, for example, the priority is embedded as follows:

Students will have opportunities to learn that Aboriginal and Torres Strait Islander Peoples have longstanding scientific knowledge traditions and developed knowledge about the world by: observation, using all the senses; prediction and hypothesis; testing (trial and error); making generalisations within specific contexts such as the use of food, natural materials, navigation and sustainability of the environment. (ACARA, 2016c)

British Columbia's New Curriculum foregrounds First Peoples Knowledge and Perspectives and highlights these throughout all areas of learning:

An important part of curriculum transformation is the authentic and respectful inclusion of Aboriginal content, culture, and knowledge. Aboriginal peoples are part of the historical and contemporary foundation of British Columbia and Canada, and an introduction to Aboriginal perspectives provides BC students with an opportunity to develop empathy, respect, and good citizenship. Aboriginal knowledge and perspectives have been integrated throughout all areas of learning. From Kindergarten to graduation, students will experience Aboriginal perspectives and understandings integrated with what they are learning. (BCME, 2016e)

Aboriginal Education appears as a subsection within each curriculum area, and each area of learning includes a rationale. An example is provided from Science:

Science provides opportunities for us to better understand our natural world. Through Science we ask questions and seek answers to grow our collective scientific knowledge. We continually revise and refine our knowledge as we acquire new evidence. Building on a foundation of respect for evidence, we are aware that our scientific knowledge is provisional and culturally-derived. Linking traditional and contemporary Aboriginal understandings and current scientific knowledge enables us to make meaningful connections to our culture, society, and everyday lives....

On the home page of the British Columbia website, fast links deliver further information, including a guide to parents that includes the following statement about this content:

Aboriginal perspectives and knowledge are an important part of the historical foundation of both B.C. and Canada, and will be integrated into every subject in the new curriculum. All students will have opportunities to better understand and respect a variety of cultures, both their own and others.

AC – Breadth

Breadth: Limited

The AC states that the priorities s cut across all areas of the curriculum and enable the delivery of learning area content at the same time as developing knowledge, understanding and skills relating to Aboriginal and Torres Strait Islander Histories and Cultures, Asia and Australia’s Engagement with Asia and/or Sustainability (ACARA, 2016d). Mapping of the AC: CCP shows that the breadth is **limited**, with content descriptions being present across three learning areas only.

BCC – Breadth

Breadth: Comprehensive

First Peoples Knowledge and Perspectives are reflected in the learning standards across all the learning areas, indicating **comprehensive** breadth. The BCC: Aboriginal Education highlights Personalised Learning, Aboriginal Perspectives and Knowledge and Flexible Learning Environments. Multiple references are made to the fact that Aboriginal knowledge and perspectives have been integrated throughout all areas of learning and that this learning is applicable to all students.

AC – Depth

Depth: Limited

The AC: CCP states that:

The organising ideas are embedded in the content descriptions and elaborations of each learning area as appropriate. As a whole, the set of organising ideas provides a coherent framework that reflects the essential learning and skills for the priority. (ACARA, 2017f)

With respect to the AC Aboriginal and Torres Strait Islander Histories and Cultures Priority, there is **limited** depth in the learning areas of the AC. While there is a greater representation in the content elaborations, especially in HASS, Languages and The Arts, these are not connected to the three key concepts of the priority or to the nine Organising Ideas.

BCC – Depth

Depth: Fundamental

The BCC: Aboriginal Education incorporates layers of guidance within all learning areas that engage students with First Peoples Knowledge and Perspectives, indicating a **fundamental** degree of depth. It also provides instructional samples for planning learning experiences for students, stating that Each sample identifies clear connections to the Big Ideas, Learning Standards, and Core Competencies. First Peoples Principles of Learning and content are included in some samples (BCME, 2015a).

In supporting teachers to deepen their own understanding of First Peoples, specific phrases in these descriptions have pop-up boxes that provide further explanation. For example, the phrase *ways of knowing* is enhanced by the advice that *ways of knowing refers to the various beliefs about the nature of knowledge that people have; they include, but are not limited to Aboriginal, gender-related, subject/discipline specific, cultural embodied intuitive beliefs about knowledge* (BCME, 2015a).

The curriculum site also offers links to Aboriginal education resources that support learning, including a link to a repository to which educators and stakeholders throughout British Columbia can contribute.

AC – Rigour

Rigour: Moderate

The Cross-Curriculum Priority, taught through the learning areas of the Australian Curriculum, provides teachers with content. This content, coupled with the Priority's Key Ideas and associated Organising Ideas, helps teachers to understand the intention and importance of the priority within the AC. However, feedback from jurisdictions and ACARA's Aboriginal and Torres Strait Islander Education Advisory Group indicates that much of the content is implicit, rather than explicit, in its location within the curriculum, as are the strategies and protocols for teaching it. Based on this, the AC: CCP can be considered **moderate** in relation to rigour.

BCC – Rigour

Rigour: Challenging

The BCC: Aboriginal Education provides obvious links between the curricular competencies, content, elaborations and key questions. For example, the curriculum competency of Questioning and predicting in Year 2 Science includes the question *How do First Peoples use their knowledge of life cycles to ensure sustainability in their local environments?* The expectations of learning are explicitly described, with questions demanding careful thought and research among all age groups. The level of rigour is thus deemed to be **challenging**.

Comparative Analysis

Both curricula are clear in their intention to provide curriculum for all students, emphasising the diversity of learners and the capacity of the curriculum to personalise learning for all students within their context. The AC does not state how the curriculum is specifically inclusive of Aboriginal and Torres Strait Islander students, whereas British Columbia's new curriculum highlights Personalised Learning, Aboriginal Perspectives and Knowledge and Flexible Learning Environments, emphasising that all areas of the curriculum that refer to First Peoples are connected and developmental across year levels. Evidence of the progressive nature of the material is found, for example, in the curricular competencies for Science, where *recognise First Peoples stories (including oral and written narratives), songs, and art, as ways to share knowledge* in Year 2 becomes *identify First Peoples perspectives and knowledge as sources of information* in Year 6.

The AC has three subjects within the learning areas that contain content descriptions reflective of the Aboriginal and Torres Strait Islander Histories and Cultures Priority. The following table indicates the number of content descriptions inclusive of the priority in each of the learning areas in Years 2, 6 and 10.

Table 3.67 Number of content descriptions including priorities in learning areas, AC, Year 2, 6 and 10

Aboriginal and Torres Strait Islander Histories and Cultures	Year 2 Content Descriptions	Year 6 Content Descriptions	Year 10 Content Descriptions
English	0	0	0
HPE	0	0	0
Mathematics	0	0	0
HASS	1	1	6
Languages	1 (F-2)	0	1 (9-10)
Science	0	0	0
Technologies	0 (F-2)	0 (5-6)	0 (9-10)
The Arts	6 (F-2)	6 (5-6)	9 (9-10)

British Columbia's Ministry of Education has a lengthy policy that supports the curriculum, titled *Aboriginal Worldviews and Perspective in the Classroom*. The policy encourages a commitment to local application of curriculum and understanding the connection to land/place. It outlines the need to appreciate the importance of language and culture and the *First Peoples Principles of Learning* and other key aspects of Aboriginal Education are applicable for all learners within the school system (BCME, 2015d, p.12).

References to Aboriginal knowledge and worldviews are both explicit and implicit in the redesigned curriculum and are evident in the rationale statements, goals, learning standards and some of the elaborated information (BCME, 2016f, p. 1).

Accordingly, First Peoples Perspectives and Knowledge appears in the following subject areas and grades:

- Arts Education 2, 6
- Social Studies 2
- Science 2, 6
- Core French 6
- Mathematics 2, 6
- English Language Arts (ELA) 2, 6. A feature of this learning area is the First Peoples Principles of Learning which are embedded in the ELA curriculum.
- Applied Design, Skills and Technologies 6, 10
- Career Education 2
- Second Languages 5-12.

In British Columbia, Aboriginal perspectives also influence assessment practices in schools. As curriculum content embeds Aboriginal knowledge and worldviews, student assessment includes the same understandings and knowledge (BCME, 2016f, p. 1). Comparison is drawn between the two curricula, acknowledging that at the time of preparing this paper, British Columbia's Grade 10 curriculum was in draft form.

For all three grade levels (2, 6 and 10), the same six Curricular Competencies apply: *Questioning and predicting, Planning and conducting, Processing and analysing data and information, Evaluating, Applying and innovating, and Communicating.*

A key feature of the BCC: Aboriginal Education is the use of the second person to pose questions directly to students. This personalises the material and the overall learning experience.

In Grade 2 Science, the *Questioning and predicting* competency is further described with *Cycles are sequences or series of events that repeat/reoccur over time. A subset of pattern, cycles are looping or circular (cyclical) in nature. Cycles help people make predictions and hypotheses about the cyclical nature of the observable patterns* and includes key questions to challenge students' thinking, such as *How do First Peoples use their knowledge of life cycles to ensure sustainability in their local environments?*

The *Communicating* competency is further described with two skills. One of these is *Express and reflect on personal experiences of place* with the elaboration:

Place is any environment, locality, or context with which people interact to learn, create memory, reflect on history, connect with culture, and establish identity. The connection between people and place is foundational to First Peoples perspectives of the world.

Key questions about place:

- What is place?
- What are some ways in which people experience place?
- How can you gain a sense of place in your local environment?
- How can you share your observations and ideas about living things in your local environment to help someone else learn about place?

In Grade 6 Science, the *Processing and analysing data and information* competency is further described with six skills. One of these is *Identify First Peoples perspectives and knowledge as sources of information.*

The *Evaluating* competency is further described with a set of six skills. One of these is *identify some of the assumptions in secondary sources with the elaboration secondary sources of evidence could include anthropological and contemporary accounts of First Peoples of BC, news media, archives, journals, etc.*

The *Communicating* competency lists two skills. As is true for Grade 2, the requirement to *Express and reflect on personal, shared, or others' experiences of place* includes the elaboration:

Place is any environment, locality, or context with which people interact to learn, create memory, reflect on history, connect with culture, and establish identity. The connection between people and place is foundational to First Peoples perspectives of the world. Key questions about place:

- How does place influence your ability to plan and conduct an inquiry?
- How does your understanding of place affect the ways in which you collect evidence and evaluate it?
- How do the place-based experiences and stories of others affect the ways in which you communicate your findings and other information?
- Ways of knowing refers to the various beliefs about the nature of knowledge that people have; they can include, but are not limited to, Aboriginal, gender-related, subject/discipline specific, cultural, embodied and intuitive beliefs about knowledge. What are the connections between ways of knowing and place?

In Grade 10 Science, the *Processing and analysing data and information* competency includes the skills: Apply First Peoples perspectives and knowledge, other ways of knowing, and local knowledge as sources of information. Further, there are sample questions provided in the elaborations that relate to First Peoples, as follows:

- Ways of knowing: Ways of knowing refers to the various beliefs about the nature of knowledge that people have. They can include, but are not limited to, First Peoples, gender-related, subject/discipline-specific, cultural, embodied, and intuitive beliefs about knowledge.

Sample questions relating to First Peoples are also provided in other competencies including *Communicating, Questioning and predicting, Planning and conducting, and Evaluating.*

Additional Observations

Together with England, New Zealand, Canada and the USA, Australia is among the most culturally diverse nations in the world and unprecedented levels of global mobility mean that culturally homogenous classrooms are now increasingly rare (Santoro and Kennedy, 2016, p. 208). Culturally responsive curriculum is becoming a priority for education systems which see it as vital to the development of a cultural diverse nation.

Representing the Aboriginal and Torres Strait Islander Histories and Cultures in the AC is a complex undertaking, and opinion is divided about what should be included and how the content could be taught most effectively. The AC recognises that the priority is for all students and that

- Aboriginal and Torres Strait Islander students are able to see themselves, their identities and their cultures reflected in the curriculum of each of the learning areas, can fully participate in the curriculum and can build their self-esteem

- Aboriginal and Torres Strait Islander Histories and Cultures Cross-Curriculum Priority is designed for all students to engage in reconciliation, respect and recognition of the world's oldest continuous living cultures. (ACARA, 2016d)

For teachers who have little or no experience with Aboriginal and Torres Strait Islander Histories and Cultures, understanding and interpreting the priority in the AC may be challenging. Teachers need to know how to build on students' existing cultural knowledge in order to scaffold their learning and to make links with sanctioned curriculum. They need to know how to use students' first language in the classroom to facilitate and enable second-language learning, and in recognition that assessment is often culturally biased, they need to know how to design culturally sensitive assessments (Donovan, 2015, p.623).

The development of culturally responsive curriculum in Australia is an ongoing process and has implications for teaching and learning at a national and local level. By acknowledging Aboriginal culture through the curriculum and their teaching practices, teachers will help Aboriginal students to recognise that their culture has value within that educational space (Donovan, 2015, p.615).

In British Columbia, the Ministry of Education provides a lengthy policy that supports the curriculum, *Aboriginal Worldviews and Perspective in the Classroom*. The policy encourages embracing local curriculum and understanding the connection to land/place. It outlines the need to appreciate the importance of language and culture and *the First Peoples Principles of Learning and other key aspects of Aboriginal Education are applicable for all learners within the school system* (BCME, 2015d, p.12).

The Framework for Aboriginal languages and Torres Strait Islander languages has implications for implementing the priority, as follows:

Embedding Aboriginal perspectives in curriculum is more than attaching something exotic onto already existing course content. This merely ticks the box...First, we need to look at the context in which we teach and why we teach – personally and professionally. We need to know who we are. Second, we need to understand the ontological difference between Indigenous Knowing and Western Knowledges and the space created between. Third, history has brought us to where we are today; we cannot escape its importance in quality teaching. Fourth, story is one of the important cornerstones of Indigenous Knowing and an important element of teaching process. Finally, process is as important as content...the need for critical self-reflection, deep listening, dialogue and collaboration. It is not easy being a teacher in the 21st century, but if we know who we are and what we value we will have the platform from which to engage with passion, creativity and a sense of social justice. (Blair, 2015, pp. 190-191)

Offering multiple approaches to teaching the priority will enhance its place in the AC and in the classroom. Some of the ways teachers approach the priority in different educational contexts across Australia will be revealed through ACARA's *Illustrations of Practice* project. The *Framework for Aboriginal Languages and Torres Strait Islander Languages* offers new approaches and pathways for incorporating the AC: CCP. Also, by acknowledging Aboriginal culture through the curriculum and their teaching practices, teachers will help Aboriginal students to recognise that their culture has value within that educational space (Donovan, 2015, p. 615).

There have been many attempts, via a plethora of policies and initiatives such as the Education Council's National Aboriginal and Torres Strait Islander Education Strategy (2015), aimed at improving the learning outcomes of Aboriginal and Torres Strait Islander students in Australia's schools. However, these students continue to remain substantially behind those of their non-Aboriginal counterparts (Thomson, De Bortoli & Buckley, 2013). What are the implications for the AC and what role does it play in improving learning outcomes of one of Australia's most disadvantaged groups?

Feedback from education systems and others about the AC: CCP suggest that it can be interpreted and implemented in different ways to ensure relevance for a school context or community. Factors contributing to this are the diversity of Aboriginal and Torres Strait Islander communities across Australia, the percentage of Aboriginal and Torres Strait Islander enrolment in schools, the degree of school community partnerships, the expertise, experience and cultural responsiveness of teachers, and the use of Aboriginal and Torres Strait Islander educators in the school.

ACARA's Aboriginal and Torres Strait Islander Education Advisory Group has warned that the priority as it currently stands could contribute to ethnic profiling (ACARA Aboriginal and Torres Strait Islander Education Advisory Group, 2016). Some voices have cautioned against forcing Aboriginal and Torres Strait Islander perspectives into the curriculum, as it can "lead to tokenism and trivialisation and does not honour Indigenous cultures or the learning area" (Rigney, 2011, p.15).

There are diverse approaches to teaching the material, from a more focused, localised approach during NAIDOC week in inner city schools to the development of *Red Dirt* curriculum where the core elements of curriculum are re-imagined to suit a remote education context. According to Osborne et al (2013, p.9), referring to Anangu schools in the remote Pitjantjatjara Yankunytjatjara Lands of the Western Desert of Australia, in teaching the mandated AC "we need to find a new road to get to the learning that we need by changing the curriculum to an Anangu curriculum".

ACARA's Aboriginal and Torres Strait Islander Education Advisory Group would like to see the curriculum move beyond any potential for ethnic profiling that suggests Aboriginal and Torres Strait Islander Peoples belong only in history books or are good at art. The intention is to develop a curriculum that recognises the contributions Aboriginal and Torres Strait Islander Peoples make in other disciplines, particularly in Science, Mathematics and STEM. Aboriginal and Torres Strait Islander knowledge is extraordinarily rich, an asset that is currently being missed and a vital contributor to nationhood (ACARA Aboriginal and Torres Strait Islander Advisory Group, 2016).

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7. LIST OF ABBREVIATIONS

ABS	Australian Bureau of Statistics
AC	Australian Curriculum
AC: CC	Australian Curriculum: Civics and Citizenship
AC: CCP	Australian Curriculum: Cross-Curriculum Priority
AC: DT	Australian Curriculum: Design and Technology
AC: E	Australian Curriculum: English
AC: EB	Australian Curriculum: Economics and Business
AC: G	Australian Curriculum: Geography
AC: GC	Australian Curriculum: General Capabilities
AC: H	Australian Curriculum: History
AC: HASS	Australian Curriculum: Humanities and Social Sciences
AC: HPE	Australian Curriculum: Health and Physical Education
AC: L	Australian Curriculum: Languages
AC: M	Australian Curriculum: Mathematics
AC: S	Australian Curriculum: Science
AC: T	Australian Curriculum: Technologies
AC: TA	Australian Curriculum: The Arts
ACARA	Australian Curriculum, Assessment and Reporting Authority
ACER	Australian Council for Educational Research
ACS	Australian Computer Society
AGDET	Australian Government Department of Education and Training
AITSL	Australian Institute for Teaching School Leadership
BC	British Columbia
BCC	British Columbia Curriculum
BCC: ADST	British Columbia Curriculum: Applied Design, Skills and Technologies
BCC: AE	British Columbia Curriculum: Arts Education
BCC: CC	British Columbia Curriculum: Core Competencies
BCC: ELA	British Columbia Curriculum: English Language Arts

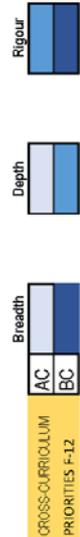
BCC: M	British Columbia Curriculum: Mathematics
BCC: PHE	British Columbia Curriculum: Physical and Health Education
BCC: S	British Columbia Curriculum: Science
BCC: SL	British Columbia Curriculum: Second Languages
BCC: SS	British Columbia Curriculum: Social Studies
BCME	British Columbia Ministry of Education
CCP	Cross-Curriculum Priority
CD	Content Descriptions
CMEC	Council of Ministers of Education
COAG	Council of Australian Governments
CPR	Cardiopulmonary Resuscitation
DoK	Depth of Knowledge
EAL/D	English is an Additional Language or Dialect
ESL	English as a Second Language
FITT	Frequency, Intensity, Type (of exercise), Time
GCN	Global Curriculum Network
GDP	Gross Domestic Product
IBE	International Bureau of Education
ICT	Information and Communication Technology
IEA	International Association for the Evaluation of Educational Achievement
IEP	Individualised Education Plan
KC	Key Concepts
KP	Key Processes
LOTE	Language Other Than English
NAEP	National Assessment of Educational Progress
NAP-ICTL	National Assessment Program-Information and Communication Technology Literacy
NAPLAN	National Assessment Program for Literacy and Numeracy
OECD	Organisation for Economic Cooperation and Development
PIRLS	Progress in International Reading Literacy Study
PISA	Programme for International Student Assessment

SAID	Specific, Adaptation, Imposed, Demands
SHE	Science as a Human Endeavour
SIS	Science Inquiry Skills
STEM	Science, Technology, Engineering, Mathematics
SU	Science Understanding
TIMSS	Trends in International Mathematics and Science Study
UNESCO	United Nations Educational, Scientific and Cultural Organisation
VUCA	Volatile, Uncertain, Complex, Ambiguous
WHO	World Health Organisation

8. APPENDIX A

International Comparison - Mapping Breadth, Depth and Rigour of AC and BC

International Comparison - Mapping Breadth, Depth and Rigour																		
Year	Criteria Applied																	
	ENGLISH	MATHEMATICS	SCIENCE	HISTORY	GEOGRAPHY	OVMS & CITIZENSHIP	ECONOMICS & BUSINESS	DANCE	DRAMA	MEDIA ARTS	MUSIC	THE ARTS	TECHNOLOGIES	TECHNOLOGIES	HEALTH & PE	LANG	GENERAL CAPABILITIES	
BREADTH	AC																	LIMITED
	BC																	FUNDAMENTAL
	AC																	COMPREHENSIVE
DEPTH	AC																	LIMITED
	BC																	FUNDAMENTAL
	AC																	CHALLENGING
RIGOUR	AC																	LIMITED
	BC																	MODERATE
	AC																	CHALLENGING



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