

**INTERNATIONAL COMPARATIVE STUDY: THE AUSTRALIAN
CURRICULUM AND THE NEW ZEALAND CURRICULUM**

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EXECUTIVE SUMMARY

This paper reports on the findings of a study comparing the Australian Curriculum (AC) with The New Zealand Curriculum (NZC). The study is the fourth in a series of international comparisons with curricula of other countries and systems. These comparisons are a component of the Curriculum business unit's 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 New Zealand for comparative study is based on the criteria stipulated for this research project; that is, it is a country showing improvement in PISA together with a similar social, geographical and educational context as that of Australia, and a curriculum that incorporates learning progressions.

The New Zealand Ministry of Education (NZME) National Curriculum includes *The New Zealand Curriculum*, used by English-medium schools and *Te Marautanga o Aotearoa*, which is used by schools (kura) that deliver the curriculum in te reo Māori and also schools that deliver in dual medium instruction. This construct contributes an example of a bi-cultural and culturally-responsive curriculum to the program of research.

Like British Columbia, Finland and Singapore, which were the subjects of previous comparative studies, The NZC is an example of a curriculum framework that sets direction for student learning and provides guidance to inform schools' work in designing and reviewing their curriculum at the local level (NZME, 2007a, p. 37).

This comparative study is based on the *Australian Curriculum Version 8.3* (ACARA, 2016), *The New Zealand Curriculum for English-medium teaching and learning in years 1–13* (NZME, 2007a), and *Te Marautanga o Aotearoa* (NZME, 2007b). *The New Zealand Curriculum for English-medium teaching and learning* considered in this study builds on an outcomes-based curriculum published in 1992 whereas the AC is in its first iteration.

Since 2007 New Zealand has published a diverse range of materials to support curriculum implementation. These materials, while not part of the formal curriculum, illustrate the scope and intent of the curriculum and reflect the ongoing and dynamic relationships between curriculum, pedagogy, assessment, social change and research that characterise contemporary curriculum development.

With Australia and the other countries and systems considered in this program of research, New Zealand also 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). This fourth comparative study in the series uses the same mixed-methods approach used throughout the project to enable a comprehensive picture of the basis for curriculum design across jurisdictions. Complementing the demographic and other contextual comparisons, eleven 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.

Comparison of the AC with The NZC reveals similarities between the two documents in relation to intent with both prioritising attitudes and dispositions such as confidence, creativity, connection, active involvement and life-long learning. Both curricula are multi-dimensional in structure, identifying disciplines and competencies as key elements of learning. The NZC also identifies values "to be encouraged, modelled and explored" (NZME, 2007a, p. 4) and principles that are "the foundations of curriculum decision-making" (NZME, 2007a, p. 9).

This study considers the curriculum for Years 2, 6 and 10 in the AC and in relation to The NZC, considers levels of achievement expected after 3, 6 and 11 years of schooling. Some variability in depth, breadth and rigour is evident across the learning areas reflecting different priorities, particularly in the early years where The NZC emphasises literacy and numeracy development.

Findings of interest in this comparative study include:

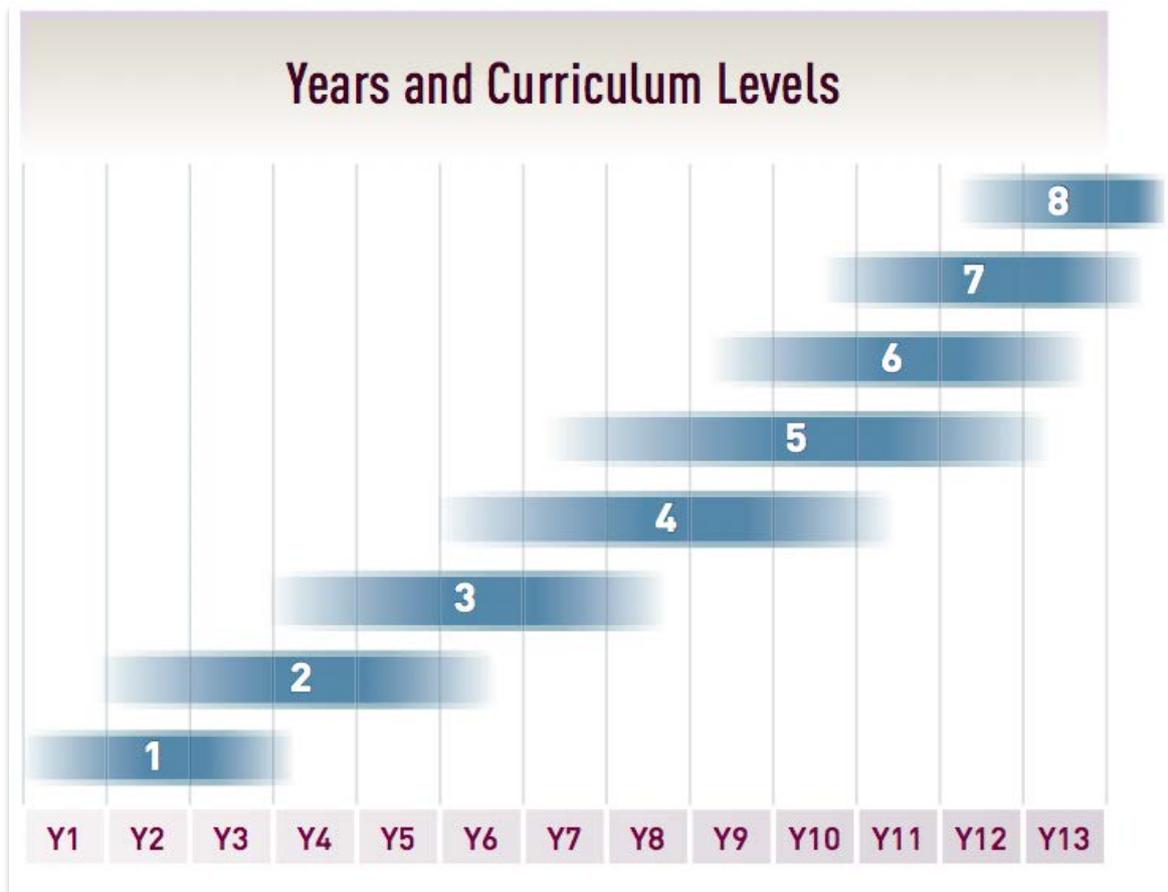
Flexibility of the curriculum

The NZC is designed as a 'curriculum framework' (NZME, 2007a, p. 4) for use by schools to develop learning programs that will provide quality education for all students "regardless of gender, ethnicity or social and economic background and to reflect its unique and diverse society" (NZME, 2015a, p. 6). Schools use The NZC and its companion document *Te Marautanga o Aotearoa* (NZME, 2007b) to make professional decisions that "address the particular needs, interests, and circumstances of the school's students and community" (NZME, 2007a, p. 37).

The learning area statements describe the essential nature (big ideas) and should be the starting point for developing programs suited to the student's needs and interests. Schools are then able to select achievement objectives to fit those programs.

The NZC achievement objectives and content are described in levels which are approximately two year bands and show how they typically relate to years at school as demonstrated in figure 1.1 below. The NZC articulates expectations related to pedagogy and inquiry. It also articulates the expectation that none of the strands in the learning areas is optional but may be emphasised at different times or in different years. Schools then make decisions about matters such as pedagogical approaches, for example, inquiry learning, teaching time for a discipline/learning area or how values, key competencies and learning

areas are incorporated in learning programs in order to meet the specific needs of learners in their context. The NZME provides extensive advice on the curriculum website to support local level planning.



From “The New Zealand Curriculum: Years and curriculum levels” by the New Zealand Ministry of Education, 2017 (<http://nzcurriculum.tki.org.nz/The-New-Zealand-Curriculum#collapsible14>). Copyright by the New Zealand Ministry of Education. Reprinted with permission.

Figure 1. 1 How curriculum levels typically relate to years at school (NZME, 2017a).

In contrast, the AC is presented as a developmental sequence of learning that describes “a progression of learning from Foundation - Year 10 that makes clear to teachers, parents, students and others in the wider community what is to be taught, and the quality of learning expected of young people as they progress through school” (ACARA, 2017b). Within this more prescriptive structure jurisdictions and schools across Australia make decisions about matters such as pedagogy, teaching time and approaches to developing general capabilities and addressing student diversity and the cross-curriculum priorities. ACARA and the jurisdictions provide advice to support school-level planning.

Prescription and volume of content

While The NZC and the AC both prescribe content and imply pedagogical directions, the AC is considerably more prescriptive and detailed in relation to disciplinary content. For some learning areas in The NZC specific requirements are specified, for example, in HPE, it is expected that all students will have had opportunities to learning basic aquatic skills by the

end of year 6. In Science The NZC specifies the same content across 2 levels, for example, Levels One and Two Science. This is similar to the use of bands in the AC, for example, The Arts F-2.

Student agency and engagement

Neither the AC nor The NZC speaks directly to students. The AC states explicitly that the document is written for teachers. The NZC is a statement of official policy written to set the direction for student learning. Regarding 'Inclusive Practices', the NZME advises that "the learner is at the centre of learning" (NZME, 2007a, p. 9). Both curricula set out a similar vision or aim that the curriculum will foster young people to become life-long learners and promote values and capabilities/competencies designed to foster this outcome.

Integration of indigenous perspectives

Consistent with New Zealand's founding document *Te Tiriti o Waitangi/The Treaty of Waitangi* the National Curriculum includes *Te Marautanga o Aotearoa*, which provides a curriculum framework for schools to plan Māori -medium learning programs. It acknowledges Māori cultural identity and values the culture and heritage of all students and their families (NZME, 2007a, pp. 6,9). In the English-medium NZC, *The Treaty of Waitangi* is a principle which underpins curriculum decision making and indigenous perspectives are embedded across the learning areas. For example, in the Social Sciences students "explore the unique bicultural nature of New Zealand society" (NZME, 2014a) and Arts education "embraces *toi Māori*, valuing the forms and practices of customary and contemporary Māori performing, musical, and visual arts" (2014b). Aboriginal and Torres Strait Islander Histories and Cultures is one of three cross-curriculum priorities of the AC. Unlike The NZC, learning about Aboriginal and Torres Strait Islander Histories and Cultures is not embedded in learning area content, rather opportunities to teach about Indigenous Histories and Cultures are presented to teachers through elaborations.

Competency-based learning

The AC makes a stated commitment to preparing students for life and work in the 21st century and includes a set of general capabilities (AC: GC) to enable this learning. Seven GCs are identified in AC: literacy, numeracy, ICT capability, critical and creative thinking, personal and social capability, intercultural understanding and ethical understanding. The NZC includes five key competencies: thinking, relating to others, using language, symbols and texts, managing self and participating and contributing. The NZC describes key competencies as encompassing knowledge, skills, attitudes and values and describes them as "the capabilities people have, and need to develop, to live and learn today and in the future" (NZME, 2014c).

Student diversity

The design of the AC reflects the commitment to equity and diversity stated in the *Melbourne Declaration on Educational Goals for Young Australians* (Ministerial Council on Education, Employment, Training and Youth Affairs (MCEETYA), 2008), with all students, regardless of their background or location, "entitled to rigorous, relevant and engaging learning programs" that address their cognitive, affective, physical, social and aesthetic needs (ACARA, 2018k). The diversity of Australian students is acknowledged in the provision of advice materials that guide teachers in personalising the curriculum.

The NZC lists 'Inclusion' as one of eight Principles that "should underpin all school decision making" (NZME, 2007a, p. 9). The NZC states that "the curriculum is non-sexist, non-racist, and non-discriminatory; it ensures that students' identities, languages, abilities, and talents are recognised and affirmed and that their learning needs are addressed" (NZME, 2007a, p. 9).

An additional The NZC Principle is 'Cultural diversity', which states that "The curriculum reflects New Zealand's cultural diversity and values the histories and traditions of all its people" (NZME, 2007a, p. 9).

Personalisation of learning

As is true of the AC, a strong commitment to equity and diversity underpins the design of The NZC. This commitment is evident in the Principles and Values that underpin The NZC which "put students at the centre of teaching and learning, asserting that they should experience a curriculum that engages and challenges them, is forward-looking and inclusive, and affirms New Zealand's unique identity" (NZME, 2007a, p. 9).

This comparative study considers the design and content of curricula from two countries 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 (GCN). 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 AC.

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 eleven smaller studies of comparison between the AC and The NZC. Eight of the eleven studies looked at the eight learning areas identified in the AC. All learning areas applicable to the two curricula were counted in the study, as shown in Table 1.1.

Table 1. 1 *Subject areas by country AC Years 1-10 and The NZC Years 1-10*

Australian Curriculum	New Zealand Curriculum
English	English
Mathematics	Mathematics and Statistics
Science	Science
Humanities and Social Science: HASS Years 1-6/7, History, Geography, Civics and Citizenship, Economics & Business (Year 10 only)	Social Sciences
The Arts: Dance, Drama, Media Arts, Music, Visual Arts	The Arts
Technologies: Design & Technologies Digital Technologies	Technology
Health and Physical Education	Health and Physical Education
Languages (Japanese)	Learning Languages (Japanese)

This study compared the AC’s seven general capabilities and The NZC’s five key competencies. The five key competencies in The NZC relate to all other aspects of the curriculum and should be embedded in learning in each learning area.

The study also considered the AC’s cross-curriculum priority – Aboriginal and Torres Strait Islander Histories and Cultures alongside Te Marautanga o Aotearoa which sets the direction for teaching and learning in Māori-medium primary and secondary schools. The NZC is also underpinned by bicultural foundations. For example, *The Treaty of Waitangi* principle states that all students have the opportunity to acquire knowledge of te reo Māori and tikanga (protocols) (NZME, 2007a, p. 9). This parallel curriculum framework is designed to enable students to:

- develop as confident and resilient individuals
- realise their full potential and lead fulfilling lives
- communicate effectively in te reo Māori
- take pride in their identity, and
- participate and succeed in te ao Māori me te ao whānui. (New Zealand Educational Institute (NZEI), 2010)

A comparative study on approaches to student diversity, considering issues of inclusivity and accessibility for a diverse range of students, was also undertaken.

ACARA’s Curriculum specialists undertook the comparisons of the learning areas, the two dimensions of general capabilities and cross-curriculum priorities, and approaches to student diversity.

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, 2001b). 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 NZC 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 *comprehensive*, as outlined in Table 1.2.

Table 1. 2 *Breadth: Terminology and explanation*

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*, as outlined in Table 1.3.

Table 1. 3 *Depth: Terminology and explanation*

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 1.4 below is based on Webb's *Depth of Knowledge (DoK)*. It was 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.

Table 1. 4 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 example/s 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 (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", according to PricewaterhouseCoopers Consulting (Australia) (2017).

The UNESCO GCN 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 researchers support 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? International research evidence suggests that school curriculum tends 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.

The OECD Education 2030 Project, in its efforts to rethink curriculum design, argues that future-ready learners will need to be able to combine knowledge, skills, attitudes and values in specific contexts for their learning to have value and positive impact. This implies a redefinition of the scope of knowledge and skills to reflect deeper understanding and broader application. 21st century learners need knowledge that is "discipline-based, inter-disciplinary, epistemic, and procedural". They also require skills that are "cognitive and meta-cognitive, social and emotional, practical and physical" (OECD, 2017a).

Over the last decade, Australia and New Zealand have both engaged in an extensive review of curriculum, consulting with stakeholders and engaging with 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. New Zealand's national curriculum model provides directions for learning with an overarching vision for students to become confident, connected, lifelong learners. Values, key competencies and learning areas provide the framework for teaching and learning, supported by eight guiding principles, to underpin all decision making in schools. (NZME, 2007a, p. 9).

According to the OECD (2018a),

New Zealand has an inclusive Early Childhood Education and Care curriculum, compulsory school from age 5 to 18, comprehensive schooling until the age of 16, low levels of grade repetition, flexible options in upper secondary education, and flexible strategies to promote education success of Māori and Pacific Islanders. (OECD, 2018a)

2.2 Demographic comparison: Australia and New Zealand

This section provides broad demographic information to assist in understanding the context of curriculum development in New Zealand and Australia. New Zealand's education system has attracted interest due to the development of Literacy Learning Progressions in 2007, subsequently used as a framework to support the design of the 2010 National Standards for reading, writing and mathematics in all schools with Year 1-8 students (New Zealand Parliamentary Library, 2010; New Zealand Government, 2018). In November 2017, it was announced that the Ministry of Education is providing advice to the Government to replace National Standards and Ngā Whanaketanga Rūmaki Māori with an improved system tailored towards strengthening progress across the curriculum (NZME, 2017b). This has led to the development of Learning Progression Frameworks to signpost the most important learning in reading, writing and mathematics, and a digital tool for teachers (Progress and Consistency Tool or PaCT) to support making dependable judgments of progress and achievement.

New Zealand participated alongside 41 countries in the OECD 2015 Programme for International Student Assessment (PISA) and New Zealand students ranked 12th in Science, 10th in reading, and 21st in Mathematics (NZME, 2016a).

In addition to Australian and New Zealander students performing consistently above OECD averages in international assessments, both countries are similar in other ways. They are modern, Western nations, operating as representative democracies. Both countries were founding members of the Commonwealth in 1931 when its independence was recognised under the Statute of Westminster. Both Australia and New Zealand operate with a Prime Minister as head of government and a Governor-General as the head of state, representing the British monarch. Both countries are situated in the Pacific region in the southern hemisphere (The Commonwealth, 2018).

In 1840, Māori chiefs were invited to sign a treaty with the British Crown and over time more than 500 Māori chiefs signed *Te Tiriti o Waitangi (The Treaty of Waitangi)* to ensure that the rights of Māori and Pakeha (non-Māori) people are protected. This treaty affects all levels of government to this day (New Zealand Immigration (NZI), 2018a).

The New Zealand Parliament is one of the world's longest continuously operating parliaments. *The New Zealand Constitution Act* was passed by the British Parliament in 1852 and it established how the country would be governed, dividing New Zealand into six provinces. Gradually, The Act was replaced with laws made by the New Zealand Parliament, and it was repealed by *The Constitution Act 1986* (New Zealand Parliament, 2017). New Zealand has two tiers of government and is not defined by state governments. The central government makes decisions affecting New Zealand in its entirety, and local government looks after services for communities through regional, city or district councils (NZI, 2018b).

Australia did not exist as a nation before 1901. *The Commonwealth of Australian Constitution Act 1900* was passed by the British Parliament and came into effect on 1 January 1901. (Australian Government (AG), 2018a). Under the national constitution, each of the six Australian states has its own government. The Australian Capital Territory and Northern Territory are self-governed according to Acts passed by the Australian Government (AG, 2018b).

The New Zealand Education funding system has been under review since 2015, and a new direction paper *Education Funding Review: Proposed New Direction*, was submitted to Cabinet in May 2018 (NZME, 2018a).

Under a new system, the *neighbourhood focus* of current disadvantaged education funding will change to *child-focused* disadvantaged education funding. The Minister of Education, Chris Hipkins, stated, “The shift to an equity focus, means that the former Risk Index could now potentially be applied to a wider range of resources, such as school staffing, or supports for student wellbeing, to see if these resources could be better directed to reduce disadvantage” (New Zealand Government, Office of the Minister of Education, 2018). The current decile system will remain in place throughout 2019 and 2020. The government has asked the NZME to recalculate deciles in schools, and the equity index¹ in services, based on the recent census information collected in March (NZME, 2018b).

In New Zealand, just under 5 per cent of students attend private, fee-paying schools (NZI, 2018c). This can be compared with Australia’s system where almost 35 per cent of students were enrolled in private, fee-paying schools, either Catholic or Independent in 2017 (Australian Bureau of Statistics (ABS), 2018a).

The Australian Government Department of Education and Training (AGDET) is responsible for national policies and programs that help Australians access quality and affordable early child care and childhood education, school education, higher education, vocational education and training, international education and research. The AGDET provides over half of total funding in the Catholic school sector and almost a third of total funding in the Independent school sector.

The six state and two territory governments have constitutional responsibility for funding the majority of government schools and for making decisions regarding the implementation of curriculum.

The Australian Curriculum, Assessment and Reporting Authority (ACARA), an independent statutory authority and is responsible for the development of a national curriculum, a national assessment program, and a national data collection and reporting program that supports learning for Australian students. The Australian National Assessment Program for Literacy and Numeracy (NAPLAN) is conducted annually in schools throughout the country.

On 12 December 2017, the New Zealand government announced that National Standards and Ngā Whanaketanga Rumaki Māori would be removed from 2018. The Education Review Office (ERO) reports on school performance, teaching quality, leadership and actions to improve learning (NZME, 2018c). The National Monitoring Study of Student Achievement (NMSSA) is designed to assess student achievement across The NZC at Year 4 and Year 8 in English-medium and state-integrated schools. The study is organised in five year cycles. The first cycle ran from 2012 to 2016 [Personal communication, NZME, 2019].

¹ The equity index estimates the extent to which each child grows up in socio-economically disadvantaged circumstances that we know can impact achievement in education (NZME, 2018b).

2.2.1 Economy

The Commonwealth (2018) indicates that both New Zealand and Australia are members of Asia–Pacific Economic Cooperation, the Organisation for Economic Co-operation and Development (OECD), Pacific Community, Pacific Islands Forum, United Nations and World Trade Organization. In addition, Australia belongs to the Indian Ocean Rim Association for Regional Cooperation.

Australia and New Zealand's Gross Domestic Product (GDP) has grown in excess of the OECD average. By 2019 the total annual GDP growth rate is forecast at 2.66 per cent in Australia compared with 2.10 per cent for the OECD total. New Zealand is expected to make greater gains with a GDP forecast of 3.04 per cent in the same year (OECD, 2018b).

Table 2. 1 *Key economic measures*

Economic measure	Australia	New Zealand	OECD Average
GDP (USD) per capita 2016 ¹	\$48,177	\$39,241 ^e	\$42,173.1 ^e
GDP forecast annual growth rate 2018 ²	2.84%	3.22%	2.36%
% GDP spent on education Primary to Secondary ³	5.8%	6.4%	5.2%
Primary education	1.8%	1.6%	1.5%
Secondary education	2.0%	2.8%	2.1%
Average \$ spent per student 2014 (USD) ⁴	\$11,149	\$10,205	\$10,759
Primary education	\$8,251	\$7,438	\$8,733
Secondary education	\$11,023	\$10,267	\$10,106

Based on and includes information from the following sources:

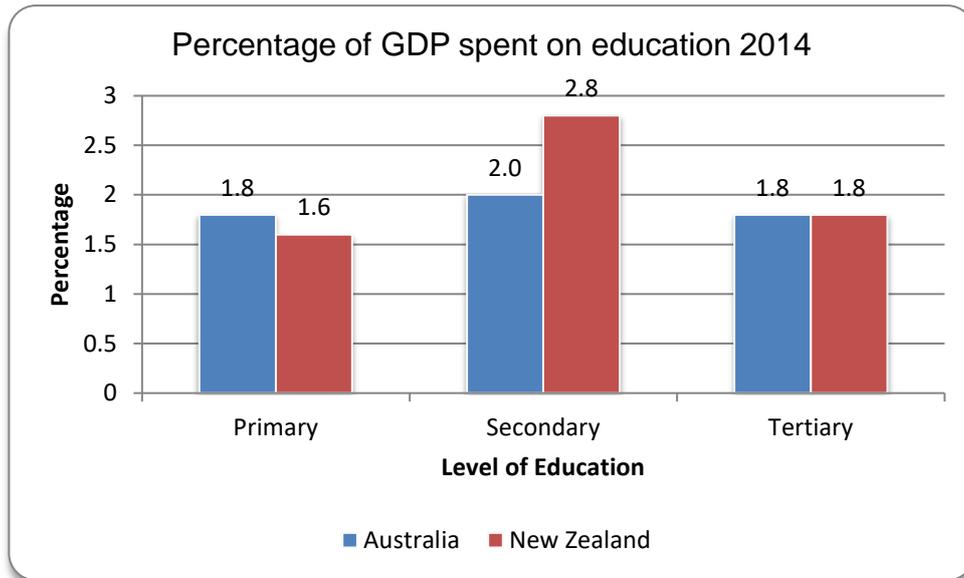
1 Source: OECD. (2018b). *Data: Gross domestic product (GDP) per capita in 2016*. e=estimated value. Accessed 15 May 2018.

2 Source: OECD. (2018c). *Data: Real GDP forecast: Annual growth rate 2018*. Accessed 15 May 2018.

3 Source: OECD. (2017b). *Education at a Glance 2017: OECD Indicators: Table B2.1 Expenditure on educational institutions as a percentage of GDP by level of education (2014)*.

4 Source: OECD. (2017b). *Education at a Glance 2017: OECD Indicators: Table B1.1 Annual expenditure per student by educational institutions for all services (2014)*.

As demonstrated in Table 2.1 above and figure 2.1 below, the two nations spent approximately the same proportion of GDP on education in 2014, with 5.8 per cent spent in Australia and 6.4 per cent in New Zealand, compared with 5.2 per cent for the OECD average. However, the percentage of GDP spent on primary education is slightly higher in Australia than in New Zealand, whereas New Zealand spends the greatest percentage of GDP on secondary education compared with other levels of education.



Based on and includes information from the following source:
 Source: OECD. (2017b). *Education at a glance: OECD Indicators: Table B2.1 Expenditure on educational institutions as a percentage of GDP, by level of education (2014)*.

Figure 2. 1 Percentage of GDP spent on education by level of education

2.2.2 Population

Australia is a large country in the southern hemisphere, ranks sixth in the world in terms of land mass, and supports a very small population with an average of three people per square kilometre. New Zealand sits to the south east of Australia across the Tasman Sea and has a higher population density, with an average of just over 18 people per square kilometre. However, according to The World Bank Group indicators in 2016, New Zealand's population density is low compared with other countries (2018).

Table 2.2 shows that in 2017 the overall population of Australia was over five times the population of New Zealand. In contrast, the land area of Australia is approximately 29 times larger than New Zealand.

Table 2. 2 Key population measures

Demographic measure	Australia	New Zealand
Population	24,702,900 ¹	4,844,200 ⁴
Area (km ²)	7,692,024 ⁸	271,000 ⁵
Average people per square kilometre	3.1 ²	18 ⁴
Average annual population growth 2017	1.6% ¹	2.1% ⁶
% of population living in Greater Capital Cities (Australia) / Urban areas (New Zealand)	67% ³	86.2% ⁷

Based on and includes information from the following sources:

1 Source: ABS. (2018b). 3101.0 - Australian Demographic Statistics, Sep 2017. Released 22 Mar 2018.

2 Source: ABS. (2016). 3218.0 - Regional Population Growth, Australia, 2014-15. Released 30 Mar 2016.

3 Source: ABS. (2017a). Census: National capital cities. ★

4 Source: Stats NZ. (2018a). Population. Dec 2017. ★

5 Source: Stats NZ. (2005). New Zealand in the OECD. Population. 2005. ★

6 Source: Stats NZ. (2017a). National Population Estimates: At 30 June 2017. Released 14 Aug 2017. ★

7 Source: Stats NZ. (2018). Urban Rural Population, 2013 (Personal communication, 2018). ★

8 Source: AG Geoscience Australia. (2004). Land areas of states and territories.

According to Statistics NZ (StatsNZ), 77 per cent of New Zealand's total population lived in the North Island, and about half of the total population lived in the upper regions of the North Island, in 2017. A total of 86.2 per cent of the population lived in urban areas [Personal communication, StatsNZ, 2018]. In Australia, 67 per cent of the population resided in Greater Capital Cities in 2016 (ABS, 2017a). A high geographical concentration was seen on the continent's south east coast and the population continued to gravitate towards large metropolitan areas. The population growth of the combined Australian capital cities increased by 81 per cent from 2016-2017 (ABS, 2018c).

In the twenty-year period from 1996 to 2016, the number of Australian children aged 0-14 years decreased from 21.47 per cent to 18.89 per cent of the total population. In the same period, the number of New Zealand children in this age group followed the same trend with a reduction from 23.02 per cent to 19.82 per cent (World Bank Group, 2017).

The average annual population growth in 2017 was 1.6 per cent in Australia (ABS, 2018d) and 2.1 per cent in New Zealand (StatsNZ, 2018a). This rate of population growth in Australia is a major factor, along with wage inflation, in the 24 per cent overall increase (AUD 34.9b to AUD 43.1b) in school education expenditure between 2005–6 and 2014–15 (O'Connell & Torii, 2016).

* This work is based on and includes Stats NZ data, licensed by Stats NZ for re-use under the Creative Commons Attribution 4.0 International Licence.

2.2.3 Indigenous population

In Australia, 649,200 people or 2.8 per cent of the population, registered as Indigenous (Aboriginal or Torres Strait Islander) in the 2016 Census (ABS, 2017a). In the same year, the Māori population in New Zealand numbered 723,500 or 15.4 per cent of the resident population (StatsNZ, 2017b).

2.2.4 Students with special needs

In New Zealand, special needs education is provided within mainstream education, in satellite classes, or at special schools. *The Education Act 1989* includes a legal obligation for schools to be inclusive and “to take all reasonable steps to act in a manner that is consistent with the principles of the Treaty of Waitangi when performing their roles and responsibilities” (NZME, 2018d). Vote Education funding is available to provide special education or support services for special needs students wherever their education is delivered, publicly or privately. In addition, special schools for children with extra support needs serve 2,799 students and operate as day or residential schools (Stats NZ, 2010; NZG, 2017).

Australian students have the right to participate in education programs on the same basis as other students, and they are supported by schools in line with *The Disability Discrimination Act 1992* (Australian Human Rights Commission, 2016) and the Disability Standards for Education 2005 (AGDET, 2018a). Each state and territory makes provision for students with special needs in consultation with schools and sectors.

2.2.5 Instruction time and class size

New Zealand and Australia differ in the allocation of instruction time in compulsory general education. Primary education starts at the age of 5 in Australia, England (United Kingdom), New Zealand and Scotland (United Kingdom) while most other surveyed countries start primary education at the age of 6 or 7 (OECD, 2017b, p. 336).

In 2016 Australian students recorded the highest number of hours of instruction time of any country in the OECD for primary and lower secondary education. The total number of hours for an Australian student in primary and lower secondary schooling was 11,000 hours, while the OECD average was 7,538 hours (OECD, 2017b, p. 334). Instruction time data for New Zealand was not available.

In New Zealand total compulsory instruction time in schools is not prescribed. However, schools in New Zealand² are required to be open for “instruction for a minimum number of hours per day or to allow sufficient instruction time to deliver a broad and balanced curriculum that includes all statutory requirements” (OECD, 2017b, p. 337). New Zealand teaching time is higher than Australia in primary and lower secondary levels, but Australia records higher teaching hours in upper secondary education, as shown in Table 2.3.

² Must be enrolled by age 6 but can start from age 5 (NZI, 2018c)

Table 2. 3 Key teaching measures

Teaching measure	Australia	New Zealand	OECD average
Ratio of students to teaching staff ¹			
• Primary education	15	16	15
• Secondary education	m	14	13
Average class size, public and private institutions ²			
• Primary education	24	m	21
• Lower Secondary education	23	m	23
Compulsory instruction time in hours, primary and lower secondary combined ³	11,000	m	7538
Net teaching time in hours ⁴			
• Primary education	866	922	794
• Lower Secondary	806	840	712
• Upper Secondary	804	760	662

Based on and includes information from the following sources:

1 Source: OECD. (2017b). *Education at a Glance: OECD Indicators: Table D2.2 Ratio of students to teaching staff in educational institutions (2015)*.

2 Source: OECD. (2017b). *Education at a Glance: OECD Indicators: Table D2.1 Average class size by type of institution (2015)*.

3 Source: OECD. (2017b). *Education at a Glance: OECD Indicators: Table D1.1 Instruction time in compulsory general education (2017)*.

4 Source: OECD. (2017b). *Education at a Glance: OECD Indicators: Table D4.1 Organisation of teachers' working time (2015)*.
m = missing data

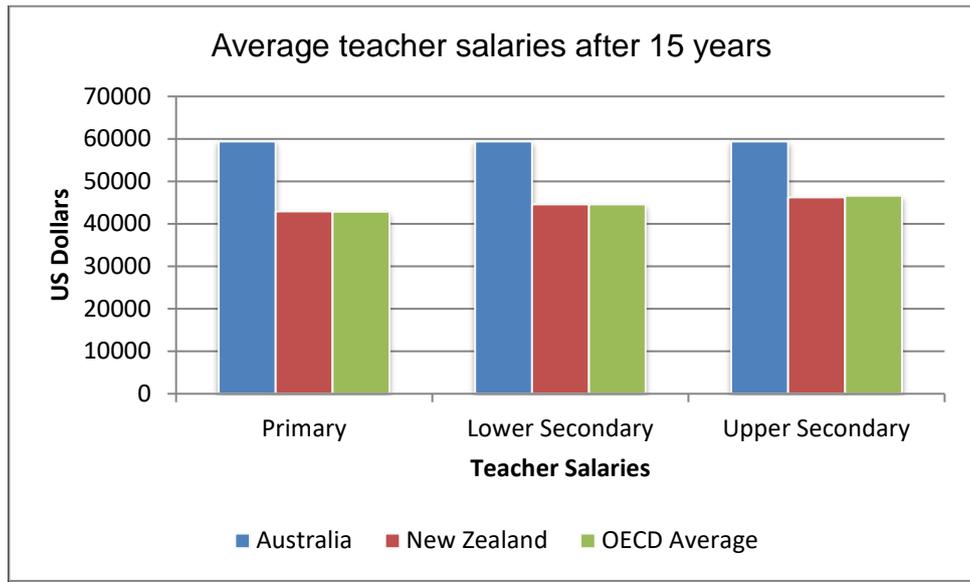
2.2.6 Teacher qualifications

In 2015, Australian teachers with 15 years of experience and typical qualifications earned more than New Zealand teachers employed at all levels of school education. The salaries of New Zealand teachers with 15 years of experience and typical qualifications were equivalent to the OECD average, as shown in figure 2.2.

The OECD found that in most countries, teachers' salaries increase from early education through to senior education (2017b, p. 362). However, the difference between pre-primary and upper secondary salaries for teachers with 15 years of experience and typical qualifications in Australia was less than 5 per cent (OECD, 2017b, p. 362). In 2015, the difference in salary for Australian teachers was only \$32 between primary and upper secondary salaries at the top of the salary scale. In New Zealand the salary difference between primary and upper secondary teachers was \$3,332, and the OECD average was greater at \$5067 at the top of the salary scale (OECD, 2017b, p. 373)³.

In some countries, such as Spain and Greece, lower secondary teachers can only reach the top salary after 35 plus years of service, but in Australia and New Zealand, the highest salary can be achieved after 6 to 9 years (OECD, 2017b, p. 366).

³ Table D3.1a. Annual teachers' salaries, in public institutions, in equivalent USD converted using PPPs for private consumption



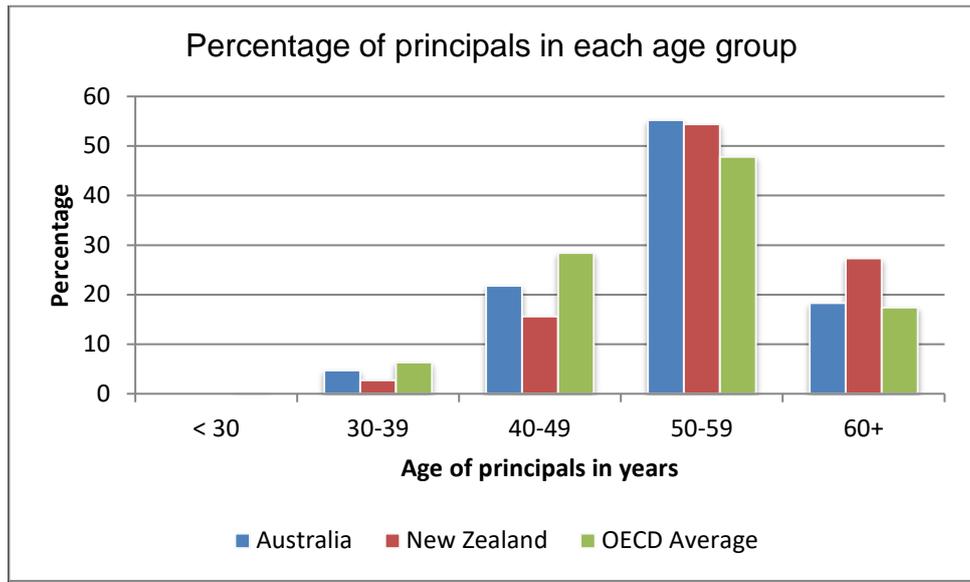
Based on and includes information from the following source:
 Source: OECD. (2017b). *Education at a glance: OECD Indicators: Table D3.1a Teachers' statutory salaries, based on typical qualifications, at different points in teachers' careers (2015)*.

Figure 2. 2 Average teacher salaries after 15 years employment

According to OECD data, the statutory salary of upper secondary teachers was 98 per cent of the salary of tertiary-educated workers and upper secondary teachers in New Zealand received a statutory salary of 93 per cent of the salary of tertiary-educated workers compared with an OECD average of 96 per cent (OECD, 2016a, p. 422)⁴.

As per figure 2.3, OECD data collected via a Teaching and Learning International Survey (TALIS) in 2013 revealed that the percentage of principals employed in lower secondary schools was similar in Australia and New Zealand in the 50 to 59 years age range. However, Australia had fewer principals in the 60 years plus group. The percentage of female principals was lower in New Zealand, at 32 per cent versus 38.6 per cent in Australia (OECD, 2016a, p. 460).

⁴ Statutory salaries of teachers with 15 years experience and typical qualifications in public institutions relative to the wages of workers (25-64 year olds) with similar educational attainment and to earnings of full-time, full-year workers with tertiary education



Based on and includes information from the following source:
 Source: OECD. (2016a). *Education at a glance: OECD Indicators: Table D6.1 Gender and age of principals in lower secondary education (TALIS, 2013)*

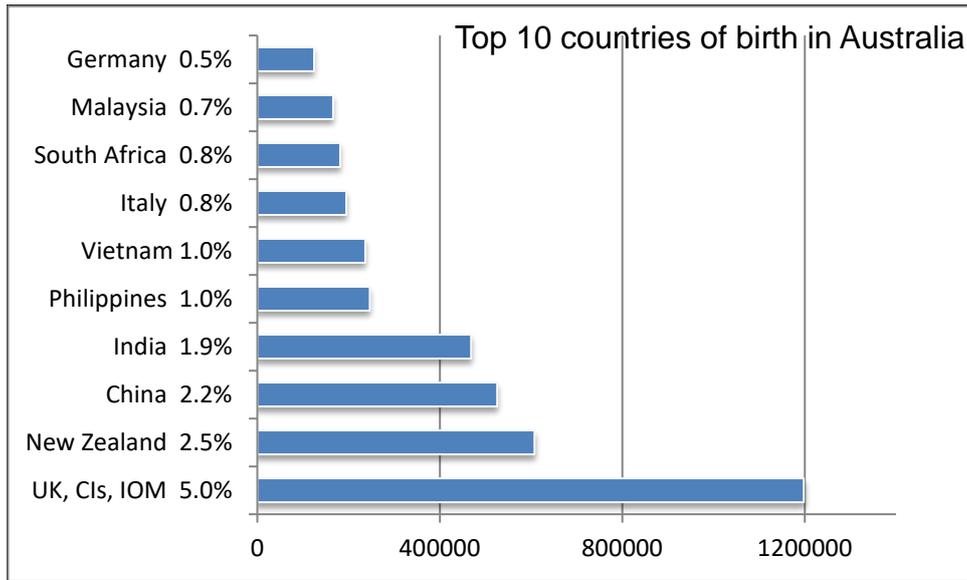
Figure 2. 3 Percentage of principals by age group

2.2.7 Migration

According to the OECD, in 2013, the foreign-born population in New Zealand was 22.4 per cent. In the same year, Australia’s foreign-born population was 27.7 per cent. The foreign-born population varied widely in OECD countries in 2013, with the highest number recorded in Luxembourg at 43.7 per cent and the lowest number in Mexico at 0.8 per cent (OECD, 2018e).

Permanent immigrant inflows are foreigners who are deemed to be settling in a country from the perspective of the destination country. In 2014, the total number of *permanent immigrant inflow* was 49,939 foreigners in New Zealand, and 231,380 foreigners in Australia. By contrast, the highest *permanent immigrant inflow* was 1,016,518 foreigners in the United States and the lowest was in Luxembourg at 18,996 foreigners in the same year (OECD, 2018e).

Since the 1960s the number of immigrants to OECD countries has increased overall although fluctuations have occurred over this period. From the start of the new millennium the number of immigrants living in OECD countries rose from around 75 million to 100 million in 2010. China, India, Mexico and the United Kingdom represented the most common countries of origin (OECD, 2014). According to the Australian Bureau of Statistics (2017b), in 2016 28.5 per cent of Australia's estimated resident population was born overseas. The most common country of birth for permanent immigrant inflow was the United Kingdom, followed by New Zealand, China and India as demonstrated in figure 2.4.



Based on and includes information from the following source:

Source: ABS. (2017b). 3412.0 - Migration, Australia, 2015-16: Estimated resident population, Australia: Top 10 countries of birth: 30 June 2016

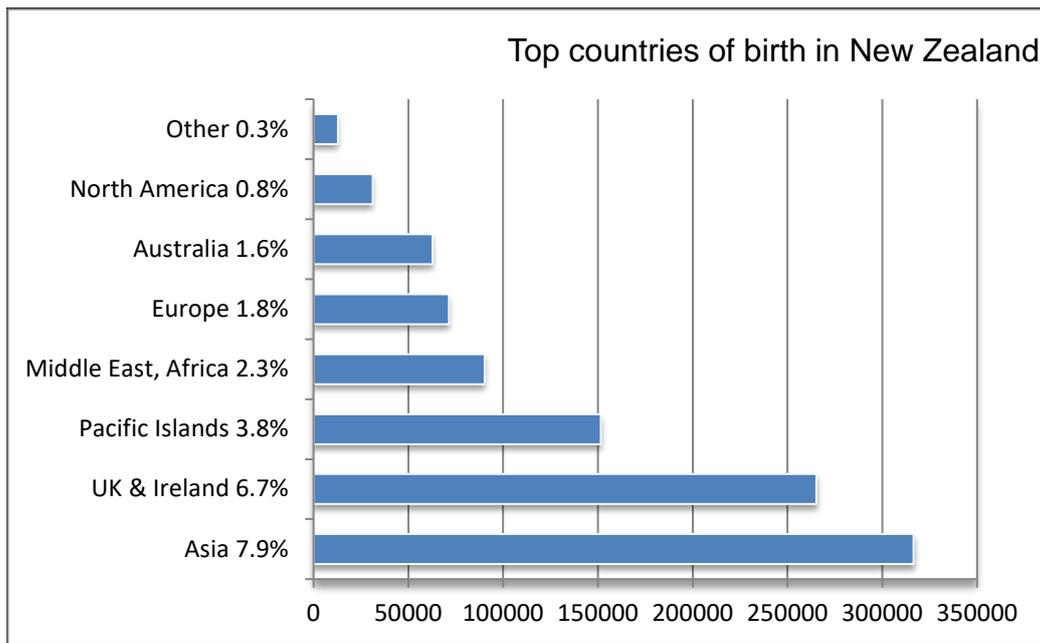
Figure 2. 4 Top ten countries of birth in the migrant population, Australia

In New Zealand, the 2013 census revealed that 25.2 per cent of people were born overseas, and England was the most common country of birth. 74.8 per cent of people were born in New Zealand, with the foreign-born population represented in figure 2.5 (Stats NZ, 2013). Within the Asian ethnic group, the largest representation was Chinese at 36.3 per cent followed by Indian at 32.9 per cent (New Zealand Government Ministry of Social Development, 2016). StatsNZ reports that, “Net migration has been the main driver of population growth in recent years, reaching a peak of 72,400 migrants in the July 2017 year” (2018b).

Between 2006 and 2013 some ethnic groups of Pacific peoples, including Tongan, Samoan, Cook Islands Māori, Niuean and Tokelauan people, slowed the rate of growth to 11.3 per cent. The Fijian ethnic group grew in the same period by 46.5 per cent (Stats NZ, 2013).

The high level of migration in Australia, particularly refugees from non-English speaking backgrounds, means that significant English support is required (Wiseman & O’Gorman, 2017; Sharma, 2014). This is available through schools and community organisations.

In New Zealand, ESOL (English for speakers of other languages) funding is available to support eligible students who are learning English as a second language and there are a wide range of resources to support teaching and learning. In addition, a virtual classroom is available to assist Years 7 – 13 students to learn English (NZME, 2016b).



Based on and includes information from the source below:
 Source: Stats NZ. (2018c). *2013 Census tables about a place: New Zealand: Birthplace of people in New Zealand*.

Figure 2. 5 Countries of birth in the migrant population, New Zealand

Languages

Aotearoa is the Māori name for New Zealand. Te Reo Māori language was recognised as an official language of Aotearoa New Zealand in 1987 and New Zealand Sign Language (NZSL) received official status in 2006 (Educational Assessment Research Unit and New Zealand Council of Educational Research (EARU and NZCER, 2018a). English is classified as a de facto official language due to its widespread use throughout New Zealand. It is the language used for teaching and learning in most New Zealand schools (NZME, 2007a, p. 14).

According to Stats NZ (2017c), data from Te Kupenga 2013, a survey of Māori wellbeing, revealed that nearly 50 per cent of Māori parents who spoke Te Reo at home were likely to enrol their child in Māori language immersion schools known as Kura Kaupapa Māori, with Te Reo Māori being the principal language of instruction. These schools reflect Māori cultural values with “a firm commitment to Te Reo Māori, a uniquely Māori vision of education, and the principles and philosophy of Te Aho Matua” (Tākao, Grennell, McKegg & Wehipeihana, 2010).

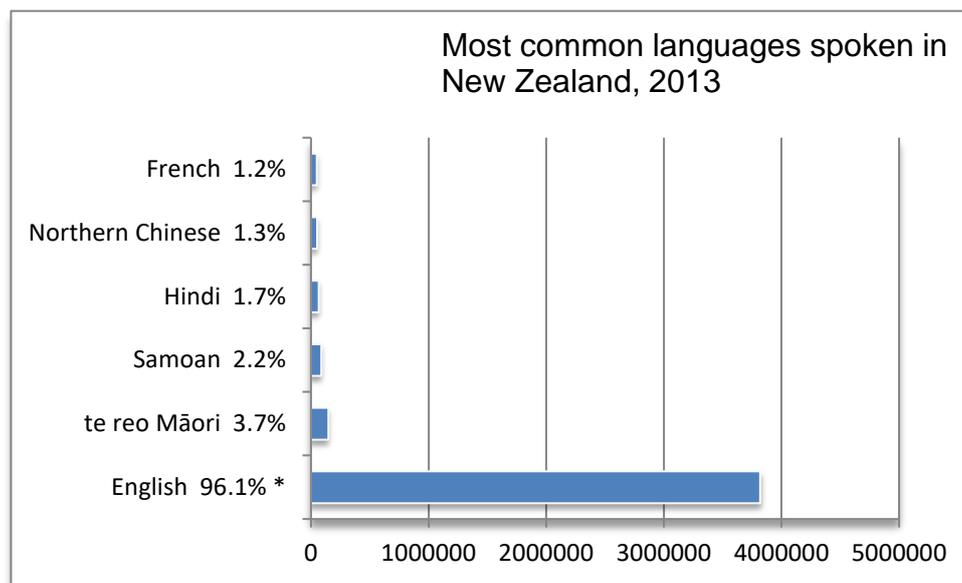
At 1 July 2017, 2.4 per cent of all New Zealand school students attended Māori-medium education, where instruction in Te Reo Māori takes place over 51 per cent of the time. In July 2016 there were 279 schools with students in Māori-medium education (NZME, 2018e).

Māori language instruction is not compulsory in New Zealand English-medium schools. However, according to the *Education (Update) Amendment Act 2017*, new legislation mandates that a school board “must take all reasonable steps to provide instruction in tikanga Māori (Māori culture) and Te Reo Māori (the Māori language) for full-time students whose parents ask for it” (New Zealand Parliamentary Counsel Office: New Zealand Legislation, 2018b).

The New Zealand Government claims that “no other country in the world has national curricula in two languages that are not direct translations of one another” (Stats NZ, 2017d).

The 2013 New Zealand census revealed that more than one language was spoken by 18.6 per cent of the New Zealand population. The most common languages apart from English in 2013 were Te Reo Māori, Samoan, Hindi, Northern Chinese and French as shown in figure 2.6. Since the 2006 census, Hindi has replaced French as the fourth most common spoken language (Stats NZ, 2014).

The number of people with the ability to use New Zealand Sign Language has declined since 2001, with 20,235 people proficient in the language in 2013 (Stats NZ, 2014).



Based on and includes information from the following source:
Source: Stats NZ. (2014). *2013 Census Quick Stats about culture and identity*.
* 96.1% of people who stated at least one language

Figure 2. 6 The most common languages spoken in New Zealand

The NZME Learning Languages study indicated that French and Spanish languages were most frequently offered by schools in 2016, closely followed by Japanese and Mandarin (EARU and NZCER, 2018b).

Australia is essentially a monolingual society despite its significant socio-cultural diversity. The language of instruction in schools is English and access to foreign language instruction varies. Around 20 per cent of the Australian population can speak more than one language and according to the 2016 census, the most common languages spoken at home, other than English, are Mandarin, Arabic, Cantonese and Vietnamese (ABS, 2017c). Around 120 Australian Indigenous languages are estimated to be in current use, with many of these languages in the endangered category as Elders pass away (Australian Institute of Aboriginal and Torres Strait Islander Studies, 2018). This number has diminished from over 250 known Australian Indigenous languages at the time of first European contact (Parliament of the Commonwealth of Australia, 2012).

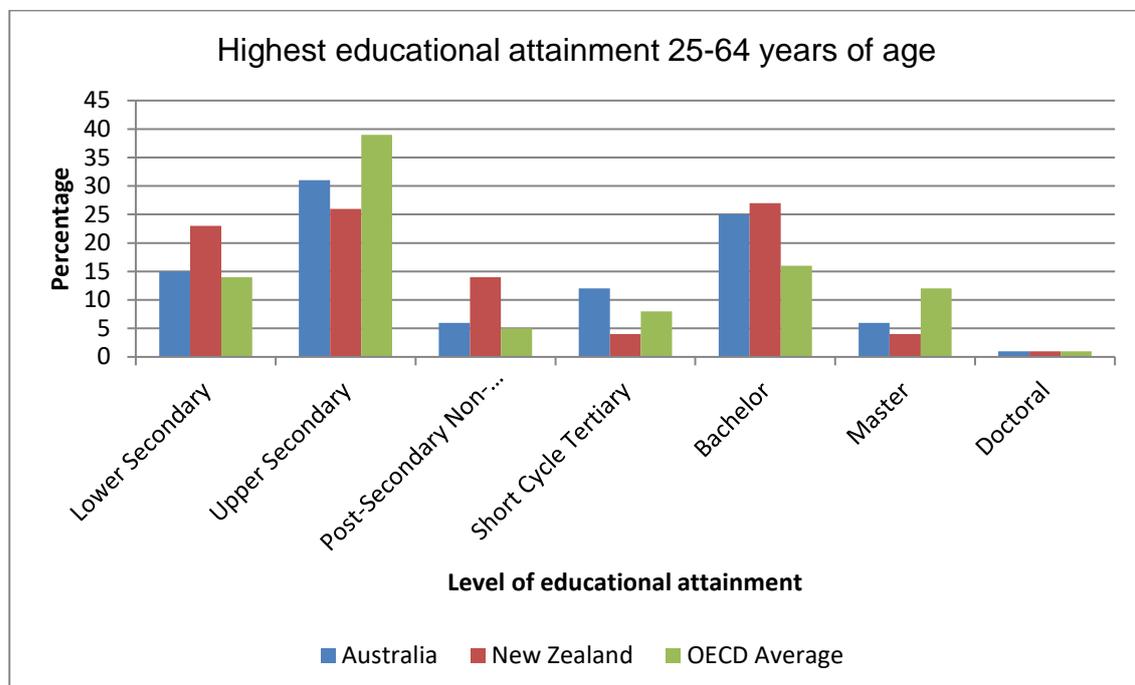
The AC provides a framework for Aboriginal and Torres Strait Islander Languages as well as curricula for 16 languages, both classical and modern (ACARA, 2017c). In comparison, The NZC Learning Languages learning area offers a range of languages including Te Reo Māori, the languages of the Pacific, the languages of Asia, the languages of Europe and the Americas and classical languages (NZME, 2002) A recent objective announced by the New Zealand government is for Māori language classes to be integrated into early childhood, primary and intermediate education by 2025 (New Zealand Government: Office of the Prime Minister, 2018).

2.2.8 Educational achievement

In 2016, the highest level of educational attainment for 25 to 64-year-olds in Australia and the OECD average was among students completing the upper secondary qualification. In New Zealand, upper secondary and bachelor graduates shared almost the same statistic, at 26 per cent and 27 per cent respectively (OECD, 2017b, p. 50).

In both Australia and New Zealand, the percentage of the population holding tertiary qualifications has increased over time. In 2016, 49 per cent of adults in Australia held a tertiary-level qualification, compared with 43 per cent in New Zealand (OECD, 2017b, p. 51).

In 2016, four per cent of the New Zealand population held a Master level qualification, compared with six per cent in Australia. In both countries, one per cent of the population was educated to Doctorate level (OECD, 2017b, p. 50). Figure 2.7 illustrates the educational attainment of adults 25-64 years of age in New Zealand and Australia.

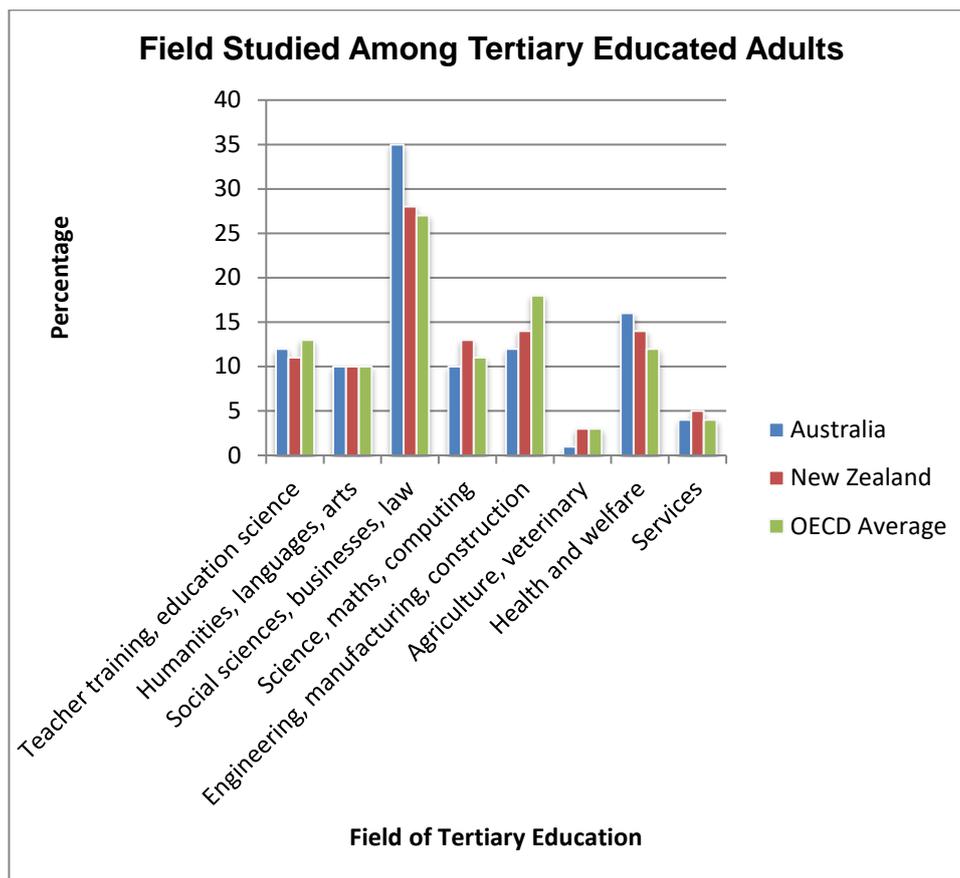


Based on and includes information from the following source:

Source: OECD. (2017b). *Education at a glance: OECD indicators: Table A1.1 Educational attainment of 25 to 64 year olds (2016)*. Note: New Zealand's Lower Secondary statistic includes data from another category.

Figure 2. 7 Highest educational attainment at 25-64 years of age

Data provided by the OECD in figure 2.8 demonstrates the field of study pursued in New Zealand in 2015 compared with Australia in 2012. Australia dominated in the field of Social Science, Business and Law graduates with 35 per cent of students choosing these courses. The OECD average for Engineering, Manufacturing and Construction graduates outstripped both Australia and New Zealand, with 18 per cent compared with 12 per cent in Australia and 14 per cent in New Zealand. Interestingly, the OECD average matches the score of both nations with ten per cent in the field of Humanities, Languages and Arts.



Based on and including information from the following source:
 Source: OECD. (2017b). *Education at a glance 2017: OECD indicators: Table A1.5 Field of education studied among tertiary-educated students (2012 or 2015)*.

Figure 2. 8 Field of study for tertiary educated adults aged 25-64 years

The gender split shows that in 2014 there were 4.4 females for every male graduate in New Zealand in the field of Education, compared with 3 females for every male graduate in Australia in the same field (OECD, 2016a, p. 70). The most popular field of study for both males and females in New Zealand was in Social Sciences, Business and Law at 28 per cent. The second most popular field of study for males was Engineering, Manufacturing and Construction at 26 per cent and only three per cent of females entered this field. The second most popular field of study for females was Health and Welfare at 22 per cent, and only six per cent of males entered this field (OECD, 2016a, p. 70).

2.2.9 Post-education employment

In 2016, Australian and New Zealand employment rates for adults aged 25-64 with upper secondary education as their highest educational attainment were 78 per cent and 80 per cent, respectively. For post-secondary non-tertiary workers aged 25-64 the employment rates were 82 per cent in Australia, 86 per cent in New Zealand and 79 per cent for the OECD average.

In 2016, the employment rates for 25-64 year olds with a Doctoral qualification or equivalent was evident in New Zealand and matched the OECD average at 91 per cent closely followed by an employment rate of 90 per cent in Australia. When compared with the 2015 table, employment prospects for Australian post-graduates with Doctoral qualifications have improved by 5 per cent, alleviating the flattened incremental advantage previously demonstrated (OECD, 2016a, p. 103; OECD, 2017b, p. 100).

The OECD data revealed that in 2016 employment prospects for graduates with tertiary qualifications improved across the OECD average, New Zealand and Australia, as shown in Table 2.4.

Table 2. 4 *Employment by highest educational attainment 2016*

Educational attainment	Australia	New Zealand	OECD average
Lower secondary	58%	72%	57%
Upper secondary	78%	80%	74%
Post-secondary, non-tertiary	82%	86%	79%
Bachelor	84%	87%	83%
Master	84%	87%	87%
Doctoral or equivalent	90%	91%	91%

Based on and includes information from the following source:

Source: OECD. (2017b). *Education at a Glance 2017: OECD Indicators, Table A5.1 Employment rates of 25-64 year olds by educational attainment (2016)*.

The OECD reported that 49 per cent of adults aged 25-64 held tertiary qualifications in Australia in 2016. At the same time, New Zealand matched the OECD average and the proportion of tertiary-qualified adults reached 43 per cent (2017b, p. 44).

When the relative earnings of workers aged 25-64 were compared, and upper secondary education equalled 100, Australians and New Zealanders with a Master qualification or Doctorate rated 179 and 178 respectively, which was below the OECD average of 198 (OECD, 2017b, p. 114).

In the transition from school to work, the percentage of young adults aged 18-24 who were not employed, nor in education and training in 2016 was 12 per cent compared with 13.1 per cent in New Zealand. The OECD average for 2016 exceeded both countries at 16.2 per cent (OECD, 2017b, p. 313).

In the second quarter of 2018 youth unemployment statistics showed 11.30 per cent youth unemployment in Australia compared with 10.90 per cent in New Zealand. The all-time average for youth unemployment is 13.43 per cent in Australia and 11.95 per cent in New Zealand. In December 2018 both were statistically below the youth unemployment average for their country average (Trading Economics, 2018a,b).

2.2.10 Comparative International Performance

The Programme for International Student Assessment (PISA) was designed to provide policy-oriented international indicators of the skills and knowledge of 15-year-old students across member countries of the OECD. Both Australia and New Zealand have participated in PISA since it was introduced in 2000.

PISA 2015 was the sixth cycle of PISA. It focused on scientific literacy, with mathematical and reading literacy as minor domains in this latest round. For the first time, PISA 2015 also included financial literacy and a collaborative problem-solving assessment for countries that elected to participate in computer-based delivery.

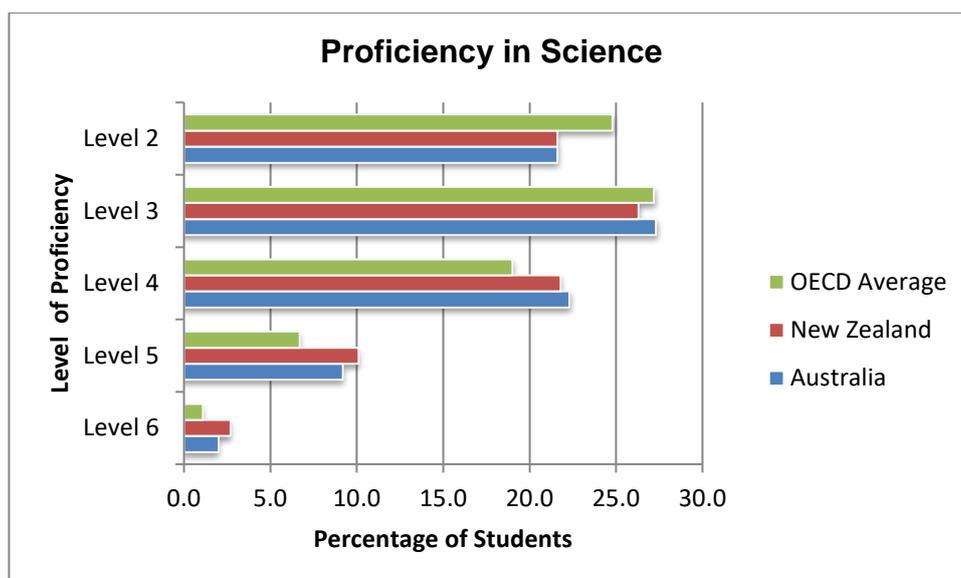
New Zealand and Australia scored above the 15.3 per cent OECD average of top performers in science, mathematics or reading, with scores of 20.5 per cent and 18.4 per cent respectively (OECD, 2018d, p. 5).

2.2.11 Performance – Science Literacy

In the 2015 cycle of PISA, New Zealand was ranked 12th and Australia 14th in Science Literacy. This result represented a statistically significant decline for both countries compared with the prior cycle (OECD, 2018d, p. 5).

Analysis of Science results at Level 5 or greater revealed that boys achieved greater scores than girls in both New Zealand and Australia (OECD, 2016b, p. 80). In 2006, eight per cent of all students in New Zealand, and nine per cent of all students in Australia, expected a career in engineering or computing, including architecture. In both countries, boys were significantly more likely to plan a career in these fields (OECD, 2015, p. 114).

In terms of the proficiency scales, 12.8 per cent of New Zealand's cohort performed at the top of Level 5 and 6; this was almost double the OECD average and above the Australian average of 11.2 per cent (see figure 2.9). It should be noted that Level 2 is considered the baseline level of proficiency in Science Literacy, and both Australia and New Zealand have recorded an increase in the number of students who did not attain this level over the last three cycles of PISA Science Literacy testing from 2006 to 2015 (OECD, 2016b, p. 321).



Based on and includes information from the following source:
 Source: OECD. (2016b). *PISA 2015 results (Volume 1): Excellence and equity in education. Figure 1.2.15 Students' proficiency in Science.*

Figure 2. 9 Science Literacy: Proficiency scales

Australia's PISA 2015 results showed a large difference between the performance of the top ten per cent and bottom ten per cent of students, as demonstrated in Table 2.5. A few countries scored a wider range of results than Australia, including New Zealand, Singapore, France and Israel (OECD, 2016b).

Table 2. 5 Performance in Science Literacy (PISA 2015)

Science Literacy	Australia	New Zealand	OECD average
Average score ¹	510	513	493
Score difference between 10 th and 90 th percentiles ¹	267	273	247
% of immigrant students in PISA 2015 ²	25%	27.1%	12.5%
% of variation explained by students' socio-economic status ³	11.7%	13.6%	12.9%

Based on and includes information from the following sources:

1 Source: OECD. (2016b). *PISA 2015 Results (Volume 1): Excellence and Equity in Education, Table I.2.3 Mean scale and variation in science performance.*

2 Source: OECD. (2016b). *PISA 2015 Results (Volume 1): Excellence and Equity in Education, Table I.7.15a Change between 2006 and 2015 in the science performance gap related to immigrant background, and socio-economic status and language spoken at home*

3 Source: OECD. (2016b). *PISA 2015 Results (Volume 1): Excellence and Equity in Education, Table I.6.17 Change between 2006 and 2015 in science performance and equity indicators.*

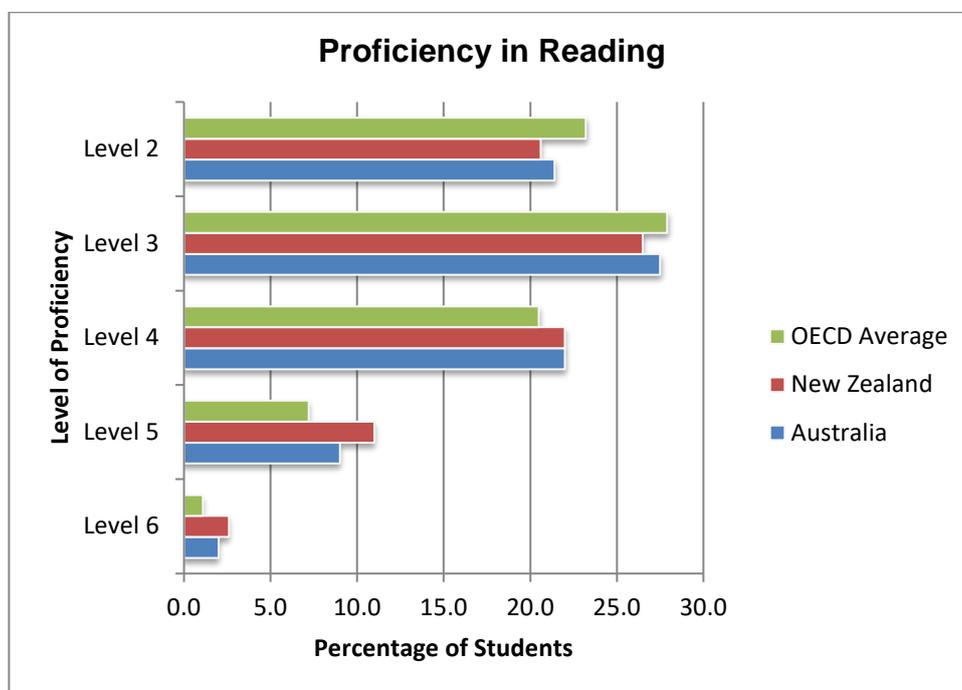
In Science Literacy there was no statistical difference between the performance of boys and girls in Australia, although boys performed worse in the tenth percentile and better in the ninetieth percentile, demonstrating a greater range of performance than girls. In New Zealand, girls performed better than boys at the tenth and fiftieth (median) percentile and boys performed better at the ninetieth percentile (OECD, 2016b, p. 328-329).

In terms of performance over time, both Australia and New Zealand lost 17 average points between 2006 and 2015, against an average OECD loss of 5 points (OECD, 2016b, p. 324).

2.2.12 Performance – Reading Literacy

New Zealand ranked tenth in Reading Literacy in PISA 2015 compared with Australia’s sixteenth ranking. Both countries recorded a reduction in average performance since 2000 (OECD, 2016b, p. 149, 160). Girls in Australia and New Zealand performed better than boys at the tenth, fiftieth (median) and ninetieth percentiles. Interestingly, the performance differential was very similar at the tenth percentile and it was the same for both countries at the fiftieth and ninetieth percentile. (OECD, 2016b, p. 383).

Figure 2.10 compares the level of proficiency in reading. The OECD average of combined Level 2 to Level 6 scores was 79.9 per cent, compared with 81.9 per cent in Australia. In New Zealand a total of 82.7 per cent was achieved (OECD, 2016b, p. 163).



Based on and includes information from the following source:
 Source: OECD. (2016b). *PISA 2015 results (Volume 1): Excellence and equity in education. Figure 1.4.8 Students' proficiency in reading.*

Figure 2. 10 Reading Literacy: Proficiency scales

Australia’s results in Reading Literacy also showed a large degree of difference between the performance of the top ten per cent and bottom ten per cent of students, as demonstrated in Table 2.6. New Zealand, France and Israel were among the few countries that produced a greater spread of performance than Australia.

Table 2. 6 Performance in Reading Literacy (PISA 2015)

Reading Literacy	Australia	New Zealand	OECD average
Average	503	509	493
Point difference between 10 th and 90 th percentiles ¹	266	275	249

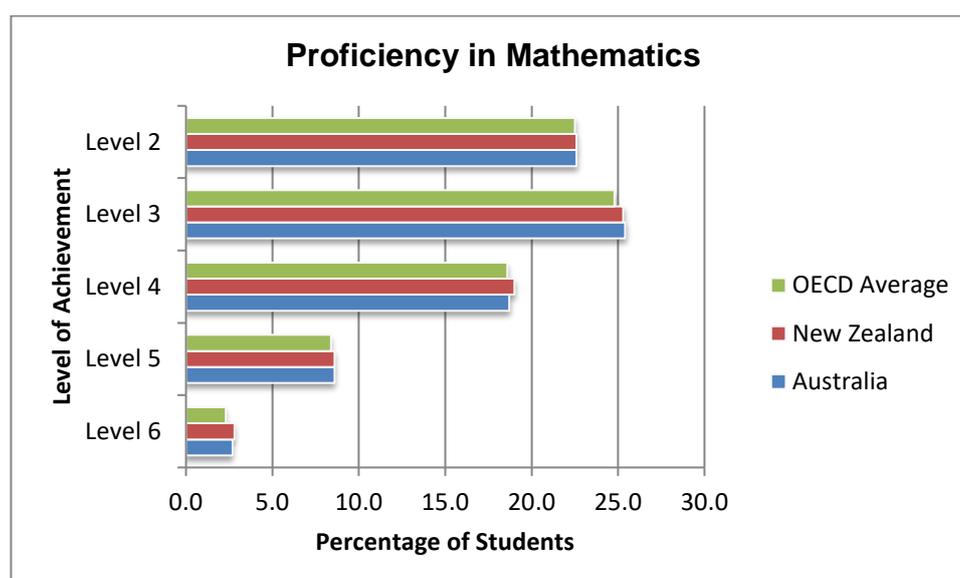
Based on and includes information from the following source:

¹ Source: OECD. (2016b). *PISA 2015 Results (Volume 1): Excellence and Equity in Education, Table I.4.3 Mean score and variation in reading performance.*

2.2.13 Performance – Mathematical Literacy

In Mathematics Literacy according to PISA 2015 results, New Zealand ranked 21st and Australia ranked 25th compared with other countries and economies. Both scores were statistically identified as significantly above the OECD average (OECD, 2016b, p. 177). In Australia and New Zealand, boys scored higher than girls at the fiftieth and ninetieth percentile (OECD, 2016b, p. 395).

As per figure 2.11, the sum of Level 2 to Level 6 scores was 78.4 per cent for New Zealand, 78 per cent for Australia and 76.6 per cent for the OECD average PISA 2015 results (OECD, 2016b, p. 192).



Based on and includes information from the following source:

Source: OECD. (2016b). *PISA 2015 results (Volume 1): Excellence and equity in education. Figure 1.5.8 Students' proficiency in Mathematics.*

Figure 2. 11 Mathematics Literacy: Proficiency scales

As per Table 2.7, Australia and New Zealand showed similar results between the Mathematics performance of the top ten per cent and lowest ten per cent of students in PISA 2015.

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

Mathematics Literacy	Australia	New Zealand	OECD average
Average ¹	494	495	490
Point difference between 10 th and 90 th percentiles ¹	242	238	232

Based on and includes information from the following source:

¹ Source: OECD. (2016b). *PISA 2015 Results (Volume 1): Excellence and Equity in Education, Table 1.5.3 Mean score and variation in Mathematics performance*

2.2.14 Comparative performance in PISA – Australia

In PISA 2015 Science Literacy, the average indigenous student in Australia scored 76 points lower than the average non-indigenous student, which is equivalent to two-and-a-half years of schooling. Further, the average indigenous student in Australia 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, as shown in Table 2.8.

Metropolitan students had a distinct advantage over provincial (or rural) students, and this was even more pronounced when compared with students living 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 for Science and Reading literacies, they were less successful in Mathematics Literacy.

Finally, difference in performance by gender was particularly significant in Reading Literacy, and females demonstrated an advantage of one year of schooling over their male peers.

2.2.15 Comparative performance in PISA – New Zealand

New Zealand's performance in reading and science has improved since 2012 relative to other countries, although these results also indicate larger proportions of students with low performance in science, reading and mathematics than prior to 2012.

New Zealand has one of the largest proportions of students across the OECD participating countries that are top performers in science, reading and mathematics although the proportion of top performers in each subject is lower than prior to 2012. Like Australia, the results indicated that there is a more significant difference between advantaged and disadvantaged students in New Zealand than the OECD average. However, in New Zealand, these students' socio-economic background is not such a strong predictor of performance as it has been in previous PISA cycles.

Table 2. 8 Score difference in performance in Australia (PISA 2015)

PISA 2015 Scores	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. (ACER). (2017). *PISA 2015: Reporting Australia's results*.

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

2. 3 Curriculum design principles and purpose

This section details contextual information related to recent curriculum design work undertaken in Australia and New Zealand. The contexts and challenges influencing curriculum decisions in Australia and New Zealand are not dissimilar, with both curricula stating the intention that students become informed citizens with the knowledge and skills to navigate an increasingly complex and rapidly changing world. This approach is consistent with education projects led by the OECD, of which both countries are members, which focus on 21st century skills such as collaboration, communication, creative and critical thinking.

The curriculum documents of both nations identify common goals of equity and excellence, derived from the basic principle that all citizens should have equal access to high-quality education and training. Curriculum design principles are reflected in a framework or curriculum structure dedicated to meeting the needs of a range of students, embracing student diversity.

Respecting the Treaty of Waitangi and that New Zealand is a bi-cultural nation, two separate documents of national curricula have been published: Te Marautanga o Aotearoa (Māori-medium) and The New Zealand Curriculum (English-medium). For the purposes of this comparative curriculum study, *The New Zealand Curriculum for English-medium teaching and learning in years 1-13* will be used (NZME, 2007a).

2.3.1 Education Policy

The New Zealand education system is founded on the *Education Act 1989* (New Zealand Government Parliamentary Council Office, 2018a), which specifies that schools are:

- self-managed as Crown entities⁵
- responsible for their own administration and management via an elected Board of Trustees.

The Board of Trustees is elected by the local community and has discretion to manage the school as it deems appropriate within the national policy, regulatory and legal framework (NZME, 2015a, p. 8).

The Education Act includes a policy framework for minimum educational standards. The National Education Guidelines in Section 60A of the Act consist of five parts:

1. National Education Goals, which include:
 - statements of desirable achievements by the school
 - statements of government policy objectives.
2. Foundation curriculum policy statements:
 - statements of policy about teaching, learning and assessment to support the curriculum and assessment responsibilities
 - national curriculum statements and locally developed curricula.
3. National curriculum statements, which include:
 - areas of knowledge and understanding to be covered by students
 - the skills to be developed by students
 - desirable levels of knowledge, understandings and skills to be achieved by students.
4. National standards (discontinued December 2017)⁶
5. National (school) administration guidelines, which include:
 - codes and principles on conduct
 - requirements for planning and reporting
 - the communication of policy objectives (NZME, 2015a, pp. 44-46; NZME, 2007, p. 43).

In New Zealand, pre-school education is optional. All children must be enrolled in school by the age of six, although they may begin school aged five. The New Zealand school system begins at primary level in Year 1. Students may complete 13 years of school, including primary school from Year 1-Year 8 for students aged 5-12, and secondary school, Years 9-13, for students aged 13-19. However, once students have reached their 16th birthday they may leave school without reaching Year 13. Students can participate in further education and training from the age of 16 (NZI, 2018c).

The NZME's role is to lead advice to Government on the education system, and work with the education sector to ensure that the education system delivers for all New Zealanders. This means having a system that provides every learner with the opportunity to gain skills

⁵ Bodies established by law in which the Government has a controlling interest – for example, by owning a majority of the voting shares or through having the power to appoint and replace a majority of the governing members – but which are legally separate from the Crown (NZME, 2015a, p. 8).

⁶ The Government announced the removal of National Standards on 12 December 2017 (NZME, 2018c).

and knowledge and to realise their unique potential and succeed in their lives (NZME, 2015a, p. 7).

The AC has its origins in a single document, the *Melbourne Declaration on Educational Goals for Young Australians* (MCEETYA, 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; and active and informed citizens.

A robust, relevant and current AC is essential to improving the quality of education for all Australian school students. Until recently, the policy plan for Australia's schools was articulated in *Students First* (AGDET, 2014a). To confirm Australia's future prosperity and to remain competitive internationally, the Australian Government is committed to giving all students access to a high-quality education. In partnership with states and territories and the non-government sector, the Government's commitment to improving outcomes in Australia's schools is reflected in four areas:

- teacher quality
- school autonomy
- engaging parents in education
- strengthening the curriculum.

In September 2018, Australia's Education Council supported the progress of the *National School Reform Agreement (the Agreement)* to the Council of Australian Governments (COAG), subject to negotiations on bilateral agreements. The Agreement will commence on 1 January 2019 and expire on 31 December 2023. It commits the Australian Government and, once signed, each state and territory to implementing reform directions supported by eight national policy initiatives, related to curriculum, assessment, teacher quality, evidence and national data.

2.3.2 The New Zealand Curriculum: Structure and design principles

The former version of the English-medium NZC was published in 1992 alongside Te Marautanga o Aotearoa, a curriculum for Māori-medium education based on Māori philosophies (NZME, 2007a; Calman, 2012, p. 6).

Social change, a greater diversity in population, advances in technology and greater workplace demands prompted a curriculum review from 2000-2002. In response to *The New Zealand Curriculum: Draft for Consultation 2006*, the NZME introduced the new English-medium curriculum for primary and secondary education in 2007 (NZME, 2007a, p. 4). The NZC (2007a) has been used for the purposes of this comparative study.

At the local level, practical support for the implementation of The NZC included in-service training courses and published guides to assist principals to effect school-wide change. The ERO report *Preparing to give effect to The New Zealand Curriculum* (2010), stated that in 2008 many schools were already implementing aspects of the new curriculum even though the deadline for full implementation was February 2010.

The NZC provides a three-layered process: the national curriculum, the school curriculum, and the classroom curriculum. It is designed as a framework so that schools have “the scope, flexibility and authority they need to design and shape their curriculum so that teaching and learning is meaningful and beneficial to their particular communities of students” (NZME, 2007a, p. 37). Teachers have the scope within the curriculum guidelines to embrace local perspectives and address the requirements and needs, talents and interests of students.

Stein (2017) observes that the New Zealand curriculum is not content-heavy and concentrates on promoting 21st century skills. The framework provides teachers with the flexibility to concentrate on the skills and mindsets required to become lifelong learners, supporting the overall aim of The NZC, to encourage students to develop and realise a vision to become “confident, connected, actively involved, lifelong learners” (NZME, 2007a, p. 8).

The NZC contains five key competencies to promote life skills and lifelong learning (NZME, 2007a, p. 12). The key competencies are designed to develop over time within social contexts and as students are challenged and supported in complex teaching and learning frameworks. The five key competencies are:

- thinking
- using language, symbols and texts
- managing self
- relating to others
- participating and contributing.

The NZC key competencies actively support students in developing a sense of agency by providing opportunities to develop self-awareness and empowerment, understanding the perspectives of others, and contributing to school, the workplace and society (NZME, 2014c).

The NZC provides an overarching vision for young people to be confident, connected, actively involved, and lifelong learners. Underpinning the vision are values, key competencies, and learning areas with achievement objectives, all based on eight principles (NZME, 2007a, p. 7).

Eight principles provide the foundations of The NZC at both a national and local level:

- high expectations
- Treaty of Waitangi
- cultural diversity
- inclusion
- learning to learn
- community engagement
- coherence
- future focus. (NZME, 2007a, p. 9)

One of the key principles is the Treaty of Waitangi. As stated by the NZME (2012b), “The Treaty of Waitangi principle puts students at the centre of teaching and learning, asserting that they should experience a curriculum that engages and challenges them, is forward-looking and inclusive, and affirms New Zealand’s unique identity”.

The principle of inclusion assures that, “the curriculum is non-sexist, non-racist, and non-discriminatory; it ensures that students’ identities, languages, abilities, and talents are

recognised and affirmed, and that their learning needs are addressed” confirming that every student is unique and has the right to quality education (NZME, 2007a, p. 9).

Values support the principles of The NZC and include, but are not limited to, excellence, innovation, inquiry and curiosity, diversity, equity, community and participation, ecological sustainability and integrity (NZME, 2007a, p. 10).

The Economist Intelligence Unit (EIU) released a report *Worldwide educating for the future index: A benchmark for the skills of tomorrow* in 2017. This index ranks economies in their ability to prepare students for 21st century life. It states that the world’s education systems are, in general, not preparing our students for the future. Many schools have systems in place to try to address these issues, although “the best schools draw on the resources of open and free societies that encourage debate and harness innovations” (EIU, 2017, p. 34). Schleicher concurs, and argues that “school is too isolated from the rest of our societies” (EIU, 2017, p. 10).

Out of 35 economies featured in the EIU 2017 report, New Zealand ranked number one, with a score of 88.9 per cent, topping the ‘best environment’ category. According to the 2017 report New Zealand provided a robust focus on project-based learning. Interestingly, of the top nine performers in this category, only two countries, Finland and France, tested the project-based learning by providing strong assessment frameworks (EIU, 2017, p. 10).

The NZC framework is distinctive in its directions for learning as demonstrated in figure 2.12 below. The overarching vision is supported by values, key competencies, and learning areas with achievement objectives, including the learning processes, knowledge and skills for eight levels of learning, all underpinned by eight principles. When designing the curriculum, schools can choose achievement objectives from learning areas to suit their students’ needs (NZME, 2007a, p. 39).

The NZC framework provides guidance including statements of purpose and scope, effective pedagogy to promote student learning, and key considerations in the design and review of The NZC to support the needs of students within their own community.



From "The New Zealand Curriculum" by the New Zealand Ministry of Education, 2017 (<http://nzcurriculum.tki.org.nz/The-New-Zealand-Curriculum>). Copyright by the New Zealand Ministry of Education. Reprinted with permission.

Figure 2. 12 A schematic view of *The New Zealand Curriculum* document

2.3.3 *Te Marautanga o Aotearoa: The Māori-medium curriculum*

Although the Māori-medium curriculum does not form part of this comparative study, the following contextual information is provided.

While the New Zealand education system performs above average internationally, it has a wide spread of achievement. Outcomes overall are poorer for Māori students, Pasifika students and students from low socio-economic backgrounds. Statistics show overrepresentation of these learners on some educational achievement indicators such as levels of literacy and numeracy, school attendance and participation (NZME, 2015a, p. 7).

Education provision in schools is underpinned by two complementary curricula to reflect New Zealand's bicultural nature, *The New Zealand Curriculum for English-medium teaching and learning in years 1 – 13* (NZC) and *Te Marautanga o Aotearoa* (TMOA). Together they make

up the National Curriculum, a framework designed to ensure all students, irrespective of their gender, sexuality, ethnicity, belief, ability or disability, social or cultural background, or geographical location, are equipped with the knowledge, competencies and values they will need to be successful citizens (NZME, 2015a, p. 11).

Each curriculum has a vision for young people developing the competencies they need for study, work and lifelong learning, so they may go on to realise their potential (NZME, 2015a, p. 11). Both require kura (schools) to engage with their community, including whanau (family), hapū (sub-tribe) and iwi (tribe) (ERO, 2012).

TMoA is the curriculum primarily for Māori-medium schools that originated in the Kohanga Reo movement in the 1980s. This movement aimed to address the failure of the education system to be responsive to Māori learners. The first Māori immersion school opened in 1985. It operated as a private school until 1989 when *The Education Act* was amended to permit the establishment of kura kaupapa Māori state schools (Controller and Auditor General, 2010).

The Māori-medium schools present the curriculum utilising te reo Māori for at least 51% of the time. This accounts for 2.4% of the total school population (Education Counts, 2017). All students learning in English-medium schools have the opportunity to acquire knowledge of te reo Māori and culture. English-medium schools either do not offer Māori language instruction in their curriculum or are either devoid of Māori language in their curriculum (for 76.9% of students) or have students learning te reo Māori as a language subject and /or are being taught the curriculum in te reo Māori for up to 50% of the time (20.7% of students) (Education Counts, 2017).

TMoA was launched in 2008 and provides the flexibility and guidance for kura to work closely with their communities to develop a school-based curriculum. Despite the consistent, overarching principles and aims of the two curricula (ERO, 2012), TMoA is not a translation of The NZC and is written in Māori from a Māori perspective. It acknowledges Māori cultural identity and values the culture and heritage of all students and their families (NZME, 2007c, p. 3).

Through the use of TMoA individual learners will develop values and attitudes:

- that provide confidence through integrity, generosity of spirit and peacefulness
- which give a clear sense of personal identity, a high level of personal awareness and self-worth
- of empathy and regard for friends and for the school whanau
- which lead to a desire to participate in all school learning activities, whether by contributing ideas, reading or listening
- which grow an enduring respect for the value of education
- of understanding, awareness and aptitude in all learning as a guide into the contemporary world
- which help them to identify and understand their own personal values and beliefs.

Students will also know traditional Māori values and understand the values of the wider world. (NZME, 2007c, p. 9). Māori language is the foundation of Māori culture and identity and is a strong foundation for Māori well-being and achievement (NZME, 2013, p. 28). TMoA

is designed to retain and revitalise te reo Māori. Te reo Māori is a taonga (treasure) passed down from ancestors, is the vehicle for Māori spirituality and thought and is protected by Te Tiriti o Waitangi. It is through te reo Māori that the diversity of Māori tikanga (customs and traditional values) can be expressed, continued and understood, thereby supporting a student's place and participation in te ao Māori (the Māori world view) (NZME, 2007c, p. 11).

TMoA provides a framework to:

- develop national policies which support the provision of Māori-medium education
- guide assessment principles and strategies
- guide evaluation of schools and the student learning outcomes
- inform teacher education and professional development providers
- provide information for parents so that they clearly understand the business of schools
- sanction the subjects taught in schools. (NZME, 2007c, p. 4)

Table 2. 9 *Learning areas in Te Marautanga o Aotearoa and The New Zealand Curriculum*

TMoA – 9 learning areas		NZC – 8 learning areas
Pāngarau	(Mathematics)	Mathematics and Statistics
Putairo	(Science)	Science
Hangarau	(Technology)	Technology
Tikanga-a-iwi	(Social Sciences)	Social Sciences
Nga Toi	(The Arts)	The Arts
Hauora	(Health and wellbeing)	Health and Physical Education
Te Reo Māori	(Māori language and literature)	
Te Ro Pākehā	(English language)	English
Ngā Reo	(Learning Languages)	Learning Languages

Source: NZME. (2018f). *Practical information about education for parents and carers: Learning areas.*

In addition to providing a framework that meets the specific needs of students in Māori-medium schools and settings, TMoA is also intended for use in English-medium schools (ERO, 2012).

Some English-medium schools have utilised the Māori philosophies and principles of TMoA to develop their graduate profiles, a vision of what a future-oriented learner looks like in terms of skills, knowledge and attitudes (NZME, 2016c).

As at 1 July 2017 there were 19,438 students enrolled in Māori-medium education, representing 2.4% of the total school population (Education Counts, 2017). These numbers have increased by approximately 1,000 students annually over the past three years. Over the same time period, the demand for te reo Māori in English-medium schooling has increased by 5000 students annually (NZME, 2018g).

Since 1999 the Government has maintained a focus on creating conditions for Māori learners to enjoy and achieve education success as Māori by focusing on:

- developing and implementing a range of changes to the education system
- working in cooperation with Māori organisations, iwi, hapu and whanau
- identifying ways to improve education experiences for Māori learners.

These dimensions all form part of the Māori Education Strategy which spans from early childhood to tertiary education and encompasses:

- the First strategy launched in 1999 and republished in 2005
- Ka Hikitia: Managing for Success 2008-2012
- Ka Hikitia: Accelerating Success 2013 – 2017
- Phase 3 and Beyond: Ka Hikitia 2018 – 2022. (NZME, 2018h)

The Controller and Auditor General (2016, pp. 10-11) acknowledges that since the launch of the *Ka Hikitia Strategy* in 2008 there have been gains in Māori student achievement.

2.3.4 The Australian Curriculum: Structure and design principles

The AC aspires to help all young Australians become successful learners, confident and creative individuals, and active and informed citizens. The three-dimensional design of the AC Foundation-Year 10 recognises disciplinary knowledge, skills and understanding alongside general capabilities and cross-curriculum priorities. Together, the AC and The NZC share a common focus on 21st century skills embedded in the transversal competences and general capabilities. As well, New Zealand’s deep commitment to guiding students towards sustainable living and understanding the importance of sustainable development (NZME, 2007a, p. 10) finds complementarity with the AC cross-curriculum priority of Sustainability.

Australia provides a high degree of legislative freedom to education authorities to develop and implement the national 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 carry devolved responsibility for primary and secondary schooling. They deliver the national curriculum in ways that best meet the needs of their students.

Eleven propositions have shaped ACARA’s development of the AC with the overarching rationale centred on quality and equity:

- 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, 2017d).

As part of the original curriculum development process, a document titled *The Shape of the Australian Curriculum* (v 4.0, 2012) underwrites the purpose of the AC:

- to improve the “quality, equity and transparency of Australia’s education system”
- 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’”. (AGDET, 2014b, p. 26)

The AC is presented as a progression of learning from Foundation to Year 10, with a range of subjects available for study in the senior secondary years (Years 11-12).

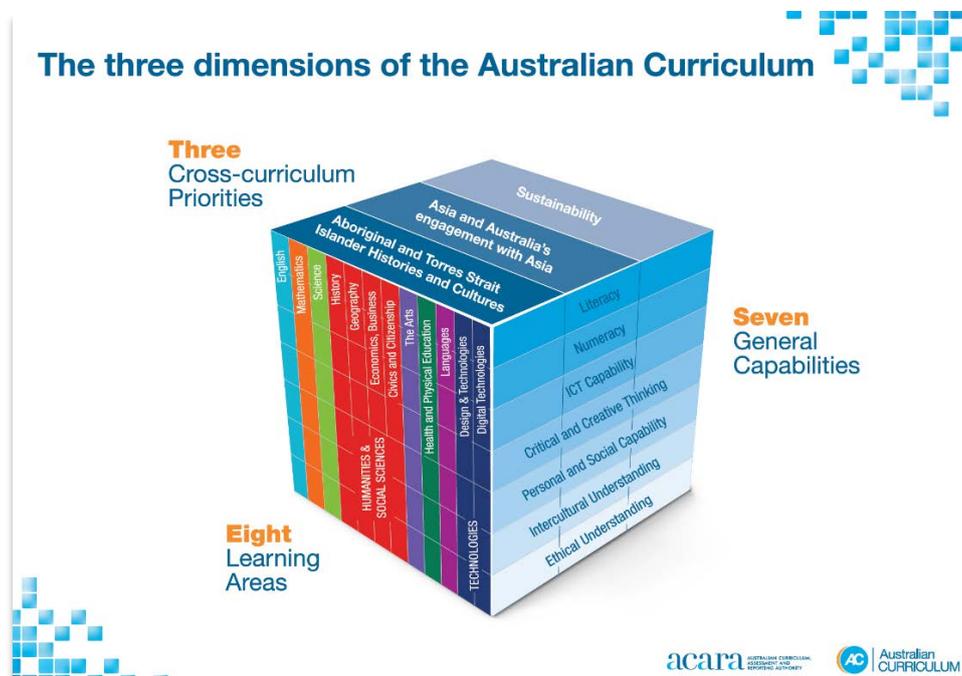
Among the eleven propositions that inform the design of the AC, item (i) explicitly states that:

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, 2017d)

Numerous other propositions also point to the teacher as the primary consumer and interpreter of the AC. Teachers and schools are expected to make all practical 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 AC's 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.

The AC is distinctive in its three-dimensional design as demonstrated in figure 2.13 below, with disciplinary knowledge, skills and understanding, general capabilities and cross-curriculum priorities appearing to be accorded equal weight. The eight learning areas comprise 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.



From The Australian Curriculum by the Australian Curriculum, Assessment and Reporting Authority (2017) (<https://www.australiancurriculum.edu.au/f-10-curriculum/structure/>). Copyright 2017 by ACARA and licensed under CC BY 4.0

Figure 2. 13 The three dimensions of the Australian Curriculum

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 AC with the curricula of other school systems and countries.

3.2 Method

This comparative study is based on the *Australian Curriculum Version 8.3* (ACARA, 2016) and *The New Zealand Curriculum* (NZME, 2007a).

ACARA's Curriculum Specialists conducted a detailed comparison of learning areas during 2018. The AC provides for eight learning areas from Foundation to Year 10. The chosen comparison points for this study were the AC Years 2, 6 and 10.

The NZC has eight comparable learning areas and each is structured as eight levels of expected learning for 13 years of schooling. The eight levels of The NZC do not relate directly to designated years of schooling. This allows flexibility for schools to design programs that support a developmental sequence of learning for all students, relevant to their context.

The AC prescribes learning in either years or bands of years that relate directly to years of schooling. While implementation takes account of individual and contextual needs, sequencing and progression in the AC structure are aligned with years of schooling.

In considering the comparative points for the purposes of this study (AC Years 2, 6 and 10), it was not possible to make a consistent alignment between AC years and The NZC levels in all learning areas. Therefore, comparison points were chosen at or across levels to mirror learning area content (knowledge, understanding, skills), at the most appropriate AC year/band of years and The NZC level(s).

In most learning areas, comparisons have been made between the AC Year 2 and The NZC Level 1 and/or Level 2, the AC Year 6 and The NZC Level 3 and/or Level 4 and the AC Year 10 and The NZC Level 5 and/or Level 6. For Languages (AC: L)/Learning Languages (NZC: LL), comparisons have been made between AC: L Year 6 (F-10 sequence) and NZC: LL Levels 3-4 and the AC Year 10 (F-10 sequence) and NZC: LL Levels 5-6. Note that in NZC: LL students begin at Level 1 when they commence learning a language irrespective of their year group.

In addition to comparisons with the learning areas of the two curricula, three other aspects of the AC were compared with relevant features of The NZC. For the AC, these included the dimensions of general capabilities, Aboriginal and Torres Strait Islander Histories and Cultures, and approaches to student diversity. For The NZC, the sections of the curriculum that document the values to be encouraged, modelled and explored, and the key competencies were examined. Aspects of the parallel curriculum *Te Marautanga o Aotearoa* and advice from the NZME regarding embedding learning about Māori culture and diversity across The NZC have been included.

The analyses of the curricular components are included in the body of this report.

3.3 Data collection and analysis

ACARA's Curriculum Specialists conducted a comparative analysis of The NZC and the AC across the approximate equivalent of Years 2, 6 and 10, using measurements of breadth, depth and rigour on a three-point scale.

In 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.

The findings were categorised and analysed by learning area and year/level.

3.4 Findings

While the structures of the AC (F–10) and The NZC (Years 1-10) are different, the breadth, depth and rigour of curriculum content are generally comparable. The following section details findings by learning area and year/level with respect to breadth, depth and rigour.

Further information regarding learning areas can be found at the AC and The NZC websites. Details are provided in the reference list in Table 3.1:

Table 3. 1 Learning area details can be found in the reference list

Subject	AC Reference	NZC Reference
English	ACARA (2018a)	NZME (2014d)
AC Mathematics NZC Mathematics and Statistics	ACARA (2018b)	NZME (2014e)
Science	ACARA (2018c)	NZME (2014f)
AC Humanities and Social Sciences NZC Social Sciences	ACARA (2018d)	NZME (2014g)
The Arts	ACARA (2018e)	NZME (2014h)
AC Technologies NZC Technology	ACARA (2018f)	NZME (2018i)
Health and Physical Education	ACARA (2018g)	NZME (2014i)
AC Languages NZC Learning Languages	ACARA (2018h)	NZME (2014j)

Breadth

On balance, the analysis by ACARA's Curriculum Specialists shows that both the AC and The NZC offer considerable breadth.

Across the AC, all learning areas at Years 2, 6, and 10 are broad in coverage, based on evidence that each learning area consists of quite detailed and lengthy content descriptions supported by elaborations, as well as other learning area specific organisers. For example, the expectations of AC: Humanities and Social Sciences (HASS) are achieved through the

combined agency of four subject areas, which are all regarded as **comprehensive** in breadth.

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 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.

The New Zealand Social Sciences (NZC: SS) is also regarded as comprehensive in breadth. NZC: SS is structured as a sequence of levels associated with the acquisition of conceptual understanding within a philosophical and pedagogical framework of inquiry-based learning. It divides into four discreet disciplines, each with its own achievement objectives at Level 6.

For students at Level 5 and Level 6, the expectations of NZC: SS are **comprehensive** in relation to breadth of coverage. The conceptual content builds on the personal view of the world targeted at Level 3 and Level 4 and is in line with Hanna's 'expanding communities' model for social science education and is age-appropriate. At Level 6 there is delineation between four disciplines within the social sciences, with broad differing conceptual targets established for Social Studies, History, Geography and Economics. The achievement objectives for Level 5 build on the skills, experiences and knowledge of earlier levels through concepts such as 'cultural interaction', 'decisions', 'impact', 'sustainability' and 'human rights'. For Level 6 the discipline-specific achievement objectives incorporate the exploration of concepts such as 'cultural adaptation and change', 'perspectives', 'choice' and 'consequences'.

The NZC: Health and Physical Education (NZC: HPE) curriculum is also deemed **comprehensive** but this determination recognised the range of content and concepts studied at each level. NZC: HPE is articulated through four underlying concepts (Hauora: wellbeing, attitudes and values, the socio-ecological perspective and health promotion), four learning strands (Personal Health and Physical development, Movement concepts and motor skills, relationships with other people and Healthy communities and environments) and seven key areas of learning (Mental health, sexuality education, food and nutrition, body care and physical safety, physical activity, sport studies and outdoor education). Three subjects (health education, physical education and home economics) are integrated within the structure. Note, in AC, aspects of Home Economics are included in the Design Technologies context – food specialisation.

However, The NZC: Technology (NZC: T) is deemed **fundamental** in relation to breadth. This determination reflects the different levels of prescription in the two curricula such as the inclusion of 'object-oriented programming' and the references to 'data' in AC: T.

The AC: Mathematics (AC: M) at Level 2 is rated as **comprehensive**, whereas The NZC: Mathematics and Statistics (NZC: MS) at Levels 1 and 2 is rated as **fundamental** reflecting The NZC's more gradual approach to introducing content:

The pace of NZC: MS would indicate that more time and emphasis is being placed on consolidating students' early number sense ensuring they progress towards additive thinking prior to being introduced to multiplication and division. NZC: MS has more depth in their coverage of early number than AC: M, whereas AC: M introduces multiplication and division to

Year 2 students through content such as repeated addition, groups and arrays giving it more breadth than NZC: MS at this level.

Depth

The comparative study reveals some variation in the judgement of depth across both curricula. At a glance, Table 3.2, indicates that most subjects in the AC are considered to have a **challenging** level of depth, particularly in the secondary years.

In the AC, subjects described as having a **challenging** level of depth include English at Years 2, 6 and 10, and Mathematics at Years, 2, 6 and 10. For The NZC, English, Mathematics and Statistics, Health and Physical Education are deemed **challenging** at Levels 3 and 4 and Levels 5 and 6. In addition, the depth of the Science curriculum is considered **challenging** at Level 6, The Arts at Levels 4 and 6 and Technology is considered **challenging** at Level 5.

Table 3. 2 *Learning areas by depth: Challenging*

Year/Level	Australian Curriculum	New Zealand Curriculum
AC: Year 2 NZC: Levels 1 and/or 2	English Mathematics The Arts	English (Levels 1 and 2) Mathematics and Statistics (Levels 1 and 2) The Arts (Level 1) Health and Physical Education (Levels 1 and 2)
AC: Year 6 NZC: Levels 3 and/or 4	English Mathematics The Arts Technologies Health and Physical Education Languages (Japanese)	English (Levels 3 and 4) Mathematics and Statistics (Levels 3 and 4) The Arts (Level 4) Health and Physical Education (Levels 3 and 4)
AC: Year 10 NZC: Levels 5 and/or 6	English Mathematics Science The Arts Technologies Health and Physical Education Languages (Japanese)	English (Levels 5 and 6) Mathematics and Statistics (Levels 5 and 6) Science (Levels 5 and 6) The Arts (Level 6) Technology (Level 5) Health and Physical Education (Levels 5 and 6)

The AC Languages and The NZC Learning Languages were not assessed at AC Year 2 and The NZC Levels 1 and 2

Variation is observed in AC: Science, with a determination of **limited** depth at Year 6. Evidence for this rating is cited from the analysis:

With regard to the depth of coverage of knowledge and skills in the curriculum, the expectations of AC: S in Year 6 are deemed to be **limited**. This rating is based, in the main, on the lack of specificity about which scientific concepts are the intended focus of teaching and learning and the depth to which they are expected to be explored.

This is to be compared with NZC: S Levels 3-4 where, although the overall judgement regarding depth is deemed to be **fundamental** some of the achievement objectives imply a **challenging** level of depth. For example, in the *Living World* strand, the achievement objective relating to Life processes is “that students will recognise that there are life

processes common to all living things and that these occur in different ways”. The depth expected for this learning can be seen in Connected 2 supporting resources provided by the NZME which suggest that students should be able to “describe and discuss the characteristics of viruses and bacteria” (NZME, 2009a, p. 4). This expectation is considered **challenging**.

Table 3.3 shows subjects deemed to be **fundamental** across the AC and The NZC. The rationale for these judgements varies, for example:

The expectations regarding depth in NZC: LL at Levels 3-4 and 5-6 are deemed **fundamental** based on the skills and knowledge content specified. For example, NZC: LL proficiency descriptor for Levels 3-4 is brief as the detailed language, knowledge, skills and understandings to be developed are locally determined according to the language chosen and the school context. Language specific guidelines are provided by the NZME. While at Levels 5-6 many of the achievement objectives begin with ‘understand’, this verb represents an expectation that students’ skills and knowledge are to be extended as far as possible in a range of contexts.

Table 3. 3 *Learning areas by depth: Fundamental*

Year/Level	Australian Curriculum	New Zealand Curriculum
AC Year 2 NZC Levels 1 and/or 2	Science Humanities and Social Sciences Technologies Health and Physical Education	Science (Levels 1 and 2) Social Sciences (Levels 1 and 2) Technology (Level 1)
AC Year 6 NZC Levels 3 and/or 4	Humanities and Social Sciences	Science (Levels 3 and 4) Social Sciences (Levels 3 and 4) The Arts (Level 3) Technology (Level 3) Learning Languages (Levels 3 and 4)
AC Year 10 NZC Levels 5 and/or 6	Science Humanities and Social Sciences	Science (Level 5) Social Sciences (Levels 5 and 6) The Arts (Level 5) Learning Languages (Levels 5 and 6)

The AC Languages and The NZC Learning Languages were not assessed at AC Year 2 and The NZC Levels 1 and 2

Rigour

Debates about curricular provisions frequently relate to rigour. There is a tendency to perceive a flexible framework or curriculum as being less rigorous. A flexible curriculum may derive its strength from the authority it gives schools and teachers to develop locally relevant learning programs. This contention is supported by evidence in material published by the NZME including resources that illustrate expected qualities of student work in specific learning areas.

The judgements in this study regarding rigour are based only on those documents that constitute the mandated curriculum. This approach can make it difficult to ascribe a challenging level of rigour where discipline-specific mandatory content is concisely written to maximise opportunities for schools and teachers to develop a local curriculum.

Table 3.4 shows **challenging** levels of rigour across both curricula.

Table 3. 4 *Learning areas by rigour: Challenging*

Year/Level	Australian Curriculum	New Zealand Curriculum
AC Year 2 NZC Levels 1 and/or 2	English Mathematics The Arts	English (Levels 1 and 2) Mathematics and Statistics (Levels 1 and 2) The Arts (Level 1) Health and Physical Education (Levels 1 and 2)
AC Year 6 NZC Levels 3 and/or 4	English Mathematics The Arts Technologies Languages	English (Levels 3 and 4) Mathematics and Statistics (Levels 3 and 4) Science (Level 4) The Arts (Level 4) Technology (Level 3) Health and Physical Education (Levels 3 and 4)
AC Year 10 NZC Levels 5 and/or 6	English Mathematics Humanities and Social Sciences The Arts Technologies Health and Physical Education Languages	English (Levels 5 and 6) Mathematics and Statistics (Levels 5 and 6) Science (Level 6) The Arts (Level 6) Technology (Level 5) Health and Physical Education (Levels 5 and 6)

The AC Languages and The NZC Learning Languages were not assessed at AC Year 2 and The NZC Levels 1 and 2

Table 3.5 shows a determination of rigour as **moderate** in Science, HASS and HPE at Year 6 in the AC. In Science and HASS, this finding shows some parallels with the determinations regarding depth. Of interest, in relation to the AC, learning areas that are deemed to have **fundamental** rigour in the primary and middle years of schooling are, generally speaking, learning areas where students also gain transferable knowledge and skills that are considered necessary for life and work beyond school. In The NZC, Science and The Arts are considered to have a **moderate** level of rigour at Levels 3 and 5 and **challenging** rigour at Levels 4 and 6. This reflects the carefully sequenced learning trajectory evident in The NZC.

Table 3. 5 *Learning areas by rigour: Moderate*

Year/Level	Australian Curriculum	New Zealand Curriculum
AC Year 2 NZC Levels 1 and/or 2	Science Humanities and Social Sciences Technologies Health and Physical Education	Science (Levels 1 and 2) Social Sciences (Levels 1 and 2) Technology (Level 1)
AC Year 6 NZC Levels 3 and/or 4	Science Humanities and Social Sciences Health and Physical Education	Science (Level 3) Social Sciences (Levels 3 and 4) The Arts (Level 3) Learning Languages (Levels 3 and 4)
AC Year 10 NZC Levels 5 and/or 6	Science	Science (Level 5) Social Sciences (Levels 5 and 6) The Arts (Level 5) Learning Languages (Levels 5 and 6)

The AC Languages and The NZC Learning Languages were not assessed at AC Year 2 and The NZC Levels 1 and 2

General Capabilities and Cross-curriculum priorities

In addition to comparing the discrete learning areas, a comparative analysis was also undertaken of the AC general capabilities and The NZC key competencies. The AC includes seven general capabilities and The NZC includes five key competencies areas as outlined in Table 3.6.

Table 3. 6 *General capabilities matched to key competencies*

New Zealand Curriculum Key Competencies	Australian Curriculum General Capabilities
Thinking	Critical and Creative Thinking Capability
Relating to others	Personal and social capability
Using language, symbols and texts	Literacy, numeracy, ICT capability
Managing self	Personal and social capability
Participating and contributing	Personal and social capability Ethical understanding Intercultural understanding

The AC general capabilities and The NZC key competencies both detail the skills, attitudes and values that each nation has identified as being critical for the development of lifelong learners who have the capacity to realise their potential. In both countries, there is the expectation that capabilities, or competencies, will develop as students engage with the content of learning areas/subjects. Both curricula set out expectations for students at different stages of schooling:

The NZ key competencies are broad descriptions that are developed in each learning area as required and are developed as part of school-based curriculum design. The AC general capabilities are detailed in learning continua which provide specific descriptions of what students can typically do by the end of a stage of schooling.

In the AC there are three cross-curriculum priorities (CCP): Asia and Australia’s Engagement with Asia; Aboriginal and Torres Strait Islander Histories and Cultures; and Sustainability. These are “three key areas that need to be addressed for the benefit of individuals and Australia as a whole”. In regard to the Aboriginal and Torres Strait Islander Histories and Cultures CCP content is included in three ways:

- organising ideas to provide guidelines for schools and teachers to add depth and richness to student learning
- icons to indicate where aspects of the priority are developed or applied via the content elaborations
- references to Aboriginal and Torres Strait Island perspectives are included in the Rationale for each of the Learning Areas

In addition, in the Languages curriculum, the Framework for Aboriginal Languages and Torres Strait Islander Languages includes three pathways – First Language Learner, Language Revival Learner and Second Language Learner.

In contrast, The NZC includes, in addition to the curriculum for English-medium instruction, a parallel curriculum *Te Marautanga o Aotearoa* (Māori -medium curriculum) (TMoA). The purpose of this curriculum framework structure is to:

ensure all students, irrespective of their gender, sexuality, ethnicity, belief, ability or disability, social or cultural background, or geographical location, are equipped with the knowledge, competencies and values they will need to be successful citizens (NZME, 2015a, p. 11).

While the two curricula share over-arching principles, neither is a translation of the other. TMoA is written in Māori from a Māori perspective. It acknowledges Māori cultural identity and values the culture and heritage of all students and their families (NZME, 2007a, p. 6). Some English-medium schools also use TMoA to inform graduate profiles and teaching in bilingual settings.

In the English-medium curriculum, the introduction to each learning area includes statements (proverbs) in Te Reo Māori and indicates, as appropriate, how the curriculum will develop students' awareness of New Zealand's bicultural heritage. For example, Science is introduced with an epigraph *Mā te whakaaro nui e hanga te whare; mā te mātauranga e whakaū*. This translates as big ideas create the house; knowledge maintains it (NZME, 2007a, pp. 28,46).

Together these aspects of The NZC communicate the importance that is attached to all students having strong knowledge and understanding of the Māori history, culture, language and its significance in a bi-cultural contemporary society.

3.5 Discussion

The NZC reflects a 21st century curriculum that aspires to a broad range of knowledge and skills and allows for local-decision making and differentiation. The framework provided for schools to develop local curriculum is underpinned by:

- a set of common principles to “put students at the centre of learning” and “underpin all school decision-making” (NZME, 2007a, p. 9). These principles focus on high expectations, Treaty of Waitangi, cultural diversity, inclusion, learning to learn, community engagement, coherence and future focus
- an expectation that students will be encouraged, through modelling and exploration, to value excellence, innovation, inquiry and curiosity, diversity, equity, community and participation, integrity and to respect themselves, others and human rights.

The NZC is structured around a set of core achievement objectives for each learning areas and underpinned by the key competences for living and lifelong learning which are described as “key to learning in every learning area” (NZME, 2007a, p.12).

This comparative study reveals the growing significance of 21st century learning skills, which are generally embedded in the elaborations and/or reinforced in the AC general capabilities. These skills and capabilities are also well documented in The NZC. Whereas the AC achievement standards detail what students are expected to do as a consequence of

subject-specific teaching, The NZC embraces an approach that enables interdisciplinary methodologies and inquiry-based learning. The NZC explicitly encourages schools to use teaching approaches that:

- create a supportive learning environment
- encourage reflective thought and action
- enhance the relevance of new learning
- facilitate shared learning
- make connections to prior learning and experience
- provide sufficient opportunities to learn.

The NZC also encourages teachers to actively inquire into the impact of their teaching on their students (NZME, 2007a, p.35).

Methodologically, this comparative study is based on a document-to-document analysis. However, one of the notable findings was the way that the support materials published by The NZC reinforce expectations regarding breadth, depth and rigour. This provides an alternative approach to the way elaborations are used in AC.

Both The NZC and the AC illustrate how breadth and depth are equally important in a quality curriculum. This study reinforces the critical role of teacher expertise to ensure that learning programs are rigorous and that student learning outcomes reflect the intentions of the mandated curricula.

The tables below summarise the findings for breadth, depth and rigour in the AC and The NZC. The following section provides the detailed analyses of each of the AC and The NZC learning areas in respect to breadth, depth and rigour at different year groups and levels.

Table 3. 7 AC breadth, depth and rigour by learning area and year group

	Year 2			Year 6			Year 10		
	Breadth	Depth	Rigour	Breadth	Depth	Rigour	Breadth	Depth	Rigour
English									
Mathematics									
Science									
Humanities and Social Sciences									
The Arts									
Technologies									
Health and Physical Education									
Languages	Not assessed								

Table 3. 8 New Zealand Curriculum breadth, depth and rigour by learning area and levels

	Levels 1 and/or 2			Levels 3 and/or 4				Levels 5 and/or 6					
	Breadth	Depth	Rigour	Breadth	Depth	Rigour	Breadth	Depth	Rigour				
English	Levels 1 and 2			Levels 3 and 4				Levels 5 and 6					
Mathematics and Statistics	Levels 1 and 2			Levels 3 and 4				Levels 5 and 6					
Science	Levels 1 and 2			Levels 3 and 4		3	4	5 and 6	5 and 6	5	6		
Social Sciences	Levels 1 and 2			Levels 3 and 4				Levels 5 and 6					
The Arts	Level 1			3	4	3	4	3	4	5	6	5	6
Technology	Level 1			Level 3				Level 5					
Health and Physical Education	Levels 1 and 2			Levels 3 and 4				Levels 5 and 6					
Learning Languages	Levels 1 and 2			Levels 3 and 4				Levels 5 and 6					
	Not assessed												

Legend: New Zealand Breadth, Depth and Rigour			
Breadth			
Depth			
Rigour			
	Limited	Fundamental, Moderate	Comprehensive, Challenging

3.6 Curriculum comparison by learning area, subject or dimension

a) Learning area: English

Comparative Curricula	
Australian Curriculum	Version 8.3, 2016
New Zealand Curriculum	2007
Year/Grade Level	
Australian Curriculum: Year 2	
New Zealand Curriculum: Levels 1 and 2 ⁷	
Learning Area/Subject	
Australian Curriculum: English (AC: E)	
New Zealand Curriculum: English (NZC: E)	

This section is a comparative study of the AC: English and The NZC: English. All references in this section are sourced from the curriculum documents AC: F-10: English (ACARA, 2018a), The NZC: English (NZME, 2014d) and The NZC: Achievement objectives by learning area (2007d), unless otherwise stated.

Expectations: Knowledge and Skills

Learning in 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 knowledge, skills and understandings for Year 2. The content descriptions are supported by elaborations which provide suggested learning experiences for the content descriptions; these vary in their 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.

Achievement standards are often dependent 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, from the Year 2 Achievement standard, “students make connections between texts by comparing content” or “they listen for particular purposes” are statements that could apply to any year level and are only meaningful when contextualised by the student work samples and content descriptions. Through study of 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, and developing understanding of grammar, spelling and vocabulary.

Unlike AC: E, NZC: E provides a broad framework with less specific content. This does not imply NZC: E is content free but emphasises that school contexts will influence the selection of detailed content, using the curriculum as a framework. In both the Australian and New Zealand English curricula learning about the structures and features of the English language is presented in a contextualised, meaning-based manner with students developing knowledge and understanding of increasingly sophisticated language across

⁷ For further information about comparative points in this study see Section 3.2 Comparative study: Method

the year levels.

The Level 2 NZ curriculum is organised into two strands of listening, reading and viewing, and speaking, writing and presenting. The key developmental indicator for students at Level 2 is that they apply the skills and knowledge they learn in English to meet the language demands of all learning areas. This is reflected, for example, when students are able to understand and create texts on an expanding range of topics. As with AC: E students are expected to be expanding their vocabularies, particularly growing their knowledge and use of subject specific language. In NZC: E Level 2 students are expected to draw inferences from verbal, visual and print texts and to begin to grasp nuances of meaning. Students are also developing their understanding that all texts have a purpose and an audience, particularly as they create their own texts. Growing awareness of audience, beyond self, is expected to influence students' thinking about various aspects of language from spelling and grammar to selection of ideas and information. Students are expected to make conscious connections between oral and written language and to distinguish some unique features of each. They use an increasing range of skills and strategies including knowledge of text structure, context and vocabulary word usage to comprehend texts and make elementary evaluative and critical judgements about texts. Both curricula provide advice about the way the curriculum may be assessed but neither prescribe assessment processes.

Measurement of Curriculum: Breadth, Depth and Rigour

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

AC – Breadth

Breadth: Comprehensive

For students in Year 2, the expectations of 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.

NZC – Breadth

Breadth: Fundamental

Breadth in NZC: E is determined to be **fundamental** due to the concise structural

coherence across the two main strands. The AC: E emphasises the co-dependence of the three strands and the application of skills and knowledge learned through the language strand in the literacy and literature strands. The breadth of The NZC is demonstrated by the literacy and language skills students learn so that they can access learning across the curriculum. The NZC is built around a set of underpinning processes and strategies which, although differently organised to AC: E, cover very similar content in Levels 1 and 2. Common concepts developed in both curricula include text purposes and audiences, language forms and features and structure and organisation of texts. The NZC Level 2 uses receptive and productive modes as the two key organising strands for the curriculum and then unpacks these into sub-strands – the same five sub-strands for each mode.

Further detail is provided through indicator points for each sub-strand. Although The NZC indicator points are less detailed or descriptive than the AC content descriptions, they are similar in intent. For example, The NZC indicator states “selects and uses processing strategies and an increasing range of comprehension strategies with some understanding and confidence” while the AC content description states: “read less predictable texts with phrasing and fluency by combining contextual, semantic, grammatical and phonic knowledge using text processing strategies, for example monitoring meaning, predicting, re-reading and self-correcting” (ACELY1669).

The NZC: E is succinct and specific in its descriptions of the knowledge, skills and understandings that students will acquire in Levels 1 and 2, but it covers a similar breadth of content to AC: E Year 2. A key point of difference in breadth is NZC: E uses the generic term ‘texts’ in its indicator statements but does not include specific reference to understanding or creating literary texts or using literary texts as a tool to develop perspectives on human nature.

AC – Depth

Depth: Challenging

For students in Year 2, the expectations of AC: E are **challenging** in relation to depth of coverage. In AC: E, 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 to both understand and create their own texts. The depth of learning occurs when knowledge is classified, transferred and applied in a range of contexts.

Understanding context is a central concept in the English curriculum, 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.

The curriculum content 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. The content clearly states that students are expected to 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 identified features. In Year 2, instructional texts selected by teachers are critical to deepening learning about text structures and language in use.

NZC – Depth

Depth: Challenging

The NZC: E is determined to be **challenging** as it provides the flexibility for teachers to strengthen the depth of particular aspects of the curriculum to match the learning needs of their students. The NZC: E has a number of indicators which strongly suggest deep learning, which support teachers to set the conditions for learning in the classroom. Although most of the indicators at Level 2 closely parallel those at Level 1, they require more sophisticated understandings and greater depth of knowledge.

The curriculum focuses on the concepts of communication and meaning. These are developed in the sub-elements of understanding purpose and audience, knowledge, and use of processing strategies, ideas and the structures and features of texts. The expectation is that the students will apply these concepts and understandings to ideas and topics in texts within and beyond the classroom, to evaluate texts or to shape texts to match cross-curricula demands. The ability to synthesise knowledge and skills to make connections and selections across aspects of the curriculum requires deep learning. By Level 2 NZC: E expects students to create texts that are crafted with a sense of personal voice, demonstrate awareness of purpose and audience, and use increasingly sophisticated language forms and features.

Students need strong knowledge and understanding of the underpinning skills, such as the constructs of grammar and knowledge of spelling conventions, to successfully engage with the more complex aspects of the curriculum. Indicators specify the use of critical thinking, such as “thinks critically about texts with some confidence”. Others imply that students apply critical and creative thinking to demonstrate deep understanding such as “makes and supports inferences from texts with some independence” and “develops and conveys personal voice where appropriate”. Deep learning is supported by the Reading and Writing Frameworks⁸ which are an adjunct resource to NZC: E achievement objectives. The Frameworks are organised around aspects of the reading and writing modes that relate to making meaning or communicating. For example, making sense of a text includes reading critically, using relevant vocabulary to discuss their subject, and showing how different aspects link together.

AC – Rigour

Rigour: Challenging

The recursive structure and nature of AC: E are the main reasons 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

⁸ These are not the same as the Learning Progression Frameworks (Reading & Writing)

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 both 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 both higher and lower order thinking skills involves rigorous learning.

NZC – Rigour

Rigour: Challenging

The NZC: E at Level 2 is a **challenging** curriculum that engenders critical and creative thinking skills underpinned by rich content knowledge. The NZC: E supports rigorous learning through its expectation that students will apply their knowledge and understandings of language to evaluate texts and create texts that express ideas on a range of topics. Students are expected to use their vocabulary knowledge and their increasing control over language forms and features to make prudent and appropriate choices as they construct texts. As well as reading for understanding, students engage in more rigorous reading behaviours as they select and use texts for particular purposes. At Level 2 students evaluate the features of texts and recognise how “texts are constructed for different purposes, audiences and situations”. Even at an elementary level being able to “evaluate the reliability and usefulness of texts with some confidence” requires the application of a range of critical and evaluative thinking skills. Understanding author voice and style requires a complex and sophisticated level of text understanding which can only be achieved through integrating and applying a range of knowledge and skills. At Level 2, students are expected to make additions or deletions to their own texts based on purpose and audience. The processes of reconsidering and making adjustments to texts are demanding and carry a high cognitive load.

The NZC: E expects students to “monitor, self-evaluate and describe their personal progress”. This is a rigorous expectation that involves students critically examining their own work, understanding and using metalanguage. Developing these skills demands a well-planned approach to teaching and learning.

Literacy is critical to students’ success across all learning areas. At Level 2 NZC: E has rigorous expectations of literacy, expressed both in the curriculum and more comprehensively in the Literacy Learning Progression. Students are expected to independently create texts to achieve their specific purpose for writing and clearly direct their texts to a particular audience through appropriate choice of content, language, and text form. Further rigour is reflected in the expectation that students read, respond to and think critically about a variety of texts, drawing on an extensive range of text processing skills.

Comparative Analysis

Both the New Zealand and Australian English curricula represent agreed and valued knowledge and skills in the national language, which all students should attain after approximately three years of formal schooling. Both curricula emphasise the parallel development of students’ receptive and productive language skills. Students in both

countries learn to understand and create accurate and appropriate texts to communicate information and ideas across the learning areas. Although structurally different, there are strong parallels in the both the intent and the standards of NZC: E and AC: E.

The critical role of literacy in the development of young Australians and New Zealanders is emphasised in both curricula. The introduction to AC: E makes this clear, stating “the study of English plays a key role in the development of reading and literacy skills which help young people develop the knowledge and skills needed for education, training and the workplace. It helps them become ethical, thoughtful, informed and active members of society”. The NZC: E opens with a similar statement, “Literacy in English gives students access to the understanding, knowledge, and skills they need to participate fully in the social, cultural, political, and economic life of New Zealand and the wider world. To be successful participants, they need to be effective oral, written, and visual communicators who are able to think critically and in depth”.

As with AC: E, NZC: E implies, but does not prescribe, a particular model of pedagogy. However, there are more explicit pedagogical expectations in the range of curriculum support resources that accompany the New Zealand achievement objectives. These include assessment tools, progressions and suggested learning tasks with accompanying work samples. The AC: E also has work samples. However, the purpose of these is to exemplify the achievement standards, not to suggest tasks.

A key point of difference is that NZC: E is not organised around years; curriculum level bands span approximately two years of schooling. It is the role of each school to develop and implement locally appropriate programs that are consistent with the principles and learning statements set out in the curriculum. Teachers are expected to tailor lessons to meet students’ individual needs. Thus, students in the same year level may be working at different curriculum levels, appropriate to their abilities and pace of progression. This is supported by the spiralling nature of the curriculum and the organisation of skills and knowledge under the same headings at each level. Both curricula build on the concepts, skills and processes introduced at earlier levels, though this is more explicit in NZC: E where the indicator statements are less dense than in AC: E and often differ by only a few words between levels. For example, at Level 2 students “recognise connections between oral, written, and visual language” while at Level 3 they “recognise and understand the connections between oral, written, and visual language”.

Rapid growth in both expressive and receptive vocabularies is expected in the AC and The NZC, with both increasing the expectation from knowledge of vocabulary to students making conscious choices in their use of words and language features to add detail or creative elements to their texts, at the middle primary level. Both curricula set expectations for students across the three modes of English. However, NZC: E has a more pronounced emphasis on reading and writing while AC: E is more balanced across the three modes and includes greater detail and specificity in the speaking and listening mode. Additionally, the AC specifies requirements regarding the range and purpose, organisational patterns, and language features of spoken texts.

The difference in specificity and detail between the two curricula is particularly evident in

the way the two curricula define expectations around text comprehension and text production. The AC: E makes frequent references to three types of texts (imaginative, informative and persuasive), for example, “Identify the audience of imaginative, informative and persuasive texts” (ACELY1668). It also references specific text forms, for example, ‘multimodal texts’ and ‘literary texts’. The NZC: E uses the generic term ‘texts’ throughout Levels 1 and 2, only differentiating with the term ‘simple texts’. The AC: E also specifies the particular language and text conventions that students will know and be able to use by the end of Year 2, for example, synonyms, articles and proper nouns, while NZC: E refers only to students “gaining increasing control of text and some grammatical conventions.”

Year/Grade Level

Australian Curriculum: Year 6

New Zealand Curriculum: Levels 3 and 4⁹

Learning Area/Subject

Australian Curriculum: English (AC: E)

New Zealand Curriculum: English (NZC: E)

Expectations: Knowledge and Skills

After seven years of formal schooling most New Zealand students have achieved Level 3 of NZC: E and are working towards Level 4. The NZC: E retains or further develops skills and understandings mastered in preceding grades. The NZC: E has the same structure across all the levels, with two strands organised under the same sub-headings, at every level. The achievement objective statements are broad, with each indicator incorporating a significant 'chunk' of learning. At Levels 3 and 4 some of the indicators capture entire language concepts, such as the forms and features of texts, for example, "recognises and understands the connections between oral, written, and visual language". Teacher understanding of the underpinning skills and knowledge is critical to ensure comprehensive teaching of this concept. This indicator also typifies the recursive nature of the curriculum, with the main variation between indicators across the levels requiring increased cognitive demand or increased independence in using the same skills and knowledge. These learning pathways are reflected in most of the Literacy Learning Progression indicators. Having achieved Level 3 and working towards Level 4, New Zealand students exercise their independence by selecting a range of processes and strategies to both understand and create texts.

Although the introductory text for NZC: E states that it should include the study of literature as a tool to understand culture and heritage, the words culture, heritage, and identity are not referenced in any of the achievement objectives for Levels 3 or 4. The curriculum refers only to 'texts', and implies but does not state, that this incorporates a critical appraisal of literary texts. Within the extensive array of resources that support the Levels 3 and 4 NZC: E, the study of literature is not highlighted. Statements such as "students explore ways in which texts use language to convey information or emotion" allude to students engaging with literary texts, but the particular knowledge and skills, such as understanding of imagery or the representation of characters in social and historical contexts, which are included in the dedicated literature strand of AC: E at Year 6, are not evident in NZC: E.

As well as the core curriculum the NZME provides a large bank of resources to "help primary and secondary teachers develop teaching and learning programmes" (NZME, 2014d). At Levels 3 and 4 Learning Progression Frameworks expand teachers' understanding of typical steps in students' reading development. The Frameworks are a clear and detailed resource, which when aligned with the Progress and Consistency Tool (PaCT) (NZME, 2018j), guide teachers' judgments about students' progress and achievement. In the achievement objectives there is one key indicator that captures text processing and comprehension in "selects and uses appropriate processing and comprehension strategies with increasing understanding and confidence". However, the Literacy Online website *Approaches to reading* (NZME, 2014d) provides information about reading a range of texts for different purposes, engaging the appropriate text processing strategies, and rich and comprehensive support for

⁹ For further information about comparative points in this study see Section 3.2 Comparative study: Method

every pertinent aspect of comprehension, such as clarifying, inferring, justifying and metacognition.

Although no longer a designated assessment or benchmarking tool, the New Zealand reading and writing standards “address the complexity and challenge of the texts and tasks that students need to engage with in order to meet the demands of *The New Zealand Curriculum*” (NZME, 2009b). The ‘standards’ resources establish the skills, knowledge and attitudes that students develop in order to read and write the texts they need to engage with all learning areas of the curriculum. They include a range of materials that exemplify tasks and texts at each level, which provide rich models for teachers in selecting texts for study and making authentic links between reading and writing. These additional resources expand the scope and detail of the English learning area and teachers can access a comprehensive range of materials that support their understanding of why, what and how to teach each level of the curriculum, according to their particular context.

Measurement of Curriculum: Breadth, Depth and Rigour

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

AC – Breadth

Breadth: Comprehensive

For students in Year 6, the expectations of AC: E are regarded as **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.

NZC – Breadth

Breadth: Fundamental

Overall the breadth of NZC: E at Levels 3 and 4 is **fundamental** in that, although it supports the development of knowledge, skills and understandings in the three modes of English, the breadth for speaking and listening is quite limited. There are no indicators which specifically

set out learning expectations for listening or speaking. In particular, there are no indicators for engaging in more formal speaking activities such as oral presentations or collaborative learning situations. The reading and writing indicators, although more comprehensive, are also broad. The NZC: E at Levels 3 and 4 follows the same developmental pathway that was evident at earlier levels, where the curriculum is built around the two interrelated strands of *Listening, reading and viewing* and *Speaking, writing and representing*. The indicator points under each sub-heading describe skills knowledge and understanding at an increased level of sophistication from the previous level. There are five achievement objectives for each of the two strands of the curriculum, with each objective expanded by a different number of indicator points. There is a slight shift in emphasis in the indicator points from Level 2 with an increased number of indicators that address *understanding* and *manipulating texts* and a slight decrease in the indicators that focus on the more mechanical aspects of English such as *spelling*. The breadth of knowledge and understanding in each indicator point has expanded from Level 2. For example, at Level 2 the indicator focused on sentences as units of meaning whereas by Level 3 students are organising their texts into paragraphs and by Level 4 they are achieving “coherence and wholeness across a text using a variety of sentence structures for effect”.

The achievement objectives at every level of NZC: E have limited detail or specificity. However, the curriculum is supported by a range of resources that provide significantly greater detail and include examples and additional information about pedagogy and assessment. For example, the statement about spelling in NZC: E for Level 3 is “demonstrates good understanding of all basic spelling patterns and sounds in written English” and at Level 4 “uses a wide range of strategies to self-monitor and self-correct spelling”. However, when the curriculum is used in conjunction with the Literacy Learning Progressions, the expectations for spelling are detailed and specific: ‘Students create texts’ “using their knowledge of how words work (e.g., knowledge of diverse phoneme–grapheme relationships, of common, reliable spelling rules and conventions, and of the meanings and spellings of morphemes), along with their knowledge of word derivations, to fluently and correctly encode most unfamiliar words, including words of many syllables and all high frequency words”.

AC – Depth

Depth: Challenging

The AC: E for Year 6 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 it 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 at 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 in both contemporary and historical contexts and in shaping and reflecting culture, extending students' understanding of the role of literature in culture. The Year 6 AC: E 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.

NZC – Depth

Depth: Challenging

At Year 6 students need to be involved in deep learning in order to engage with the fundamental tenant of the curriculum which is to “learn about the English language and to learn through the language” (NZME, 2014d).

As they complete Level 3 and work towards Level 4 the depth of the curriculum is evident in its requirement that students respond to and think critically about texts and create texts about increasingly **challenging** subject matter. At this level greater depth of learning requires students to challenge established thinking and test view points and perspectives. This is outlined as a general principle in the *high expectations* support pages for the curriculum (NZME, 2012a) and given shape in the English curriculum through achievement standard indicators such as students will “identify particular points of view and recognise that texts can position a reader”.

The English Online resource for Level 4: Listening reading and viewing provides extensive information about the types of texts students are expected to create and includes specific information about “the deeper features of texts” such as control over author’s voice and selection of language features to “have an impact on their readers” (NZME, 2018k). Along with snapshots of teachers’ practice there are detailed notes to support teachers to ensure the curriculum framework is interpreted as robust and challenging lessons.

Autonomous student learning and self-monitoring are features of NZC: E at Levels 3 and 4. Students are expected to increase their level of control and independence in selecting processes and strategies to write texts for a range of more complex purposes including arguing and explaining. They independently create more complex texts that reflect content, structures and language features appropriate to defined audiences. Creating texts of this standard requires students to draw on deep knowledge of grammar and language structures and to synthesise their knowledge of all the components of a text to create a cohesive and complex text. They are expected to demonstrate divergent thinking which questions current values, practices and ideas and to use creative thinking to generate new possibilities. Deep learning is further demonstrated at Level 4 where students are generating as well as answering their own questions to reflect their rich understanding of language forms and features.

AC – Rigour

Rigour: Challenging

The AC: E for Year 6 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. The curriculum demands a sophisticated understanding and application of fundamental ideas so that students can confront and evaluate ideas and problems and seek deeper, 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 only in subject 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.

NZC – Rigour

Rigour: Challenging

Progression through the levels of NZC: E rather than through a year-based curriculum provides a strong foundation for students to engage in rigorous learning. The parallel development of key concepts in the receptive and productive domains underpins the **challenging** rigour in NZC: E at Levels 3 and 4.

The NZC: E at Levels 3 and 4 promotes intellectual growth as it expects students to read and create texts which explore complex ideas. As students attempt to write clearly and coherently about these increasingly complex ideas, their writing supports their intellectual growth. Through writing, students develop their ability to think, communicate ideas, and clarify their understanding of abstract concepts. A rigorous curriculum requires students to take an active role by reflecting on their own learning and seeking feedback that is targeted to support their ongoing development. The NZC: E begins to develop students' self-evaluation skills at Level 1 so that by Level 4 they are "monitoring, self-evaluating, and able to articulate the development in their learning with confidence". At Levels 3 and 4 there is an emphasis on students selecting and flexibly applying the knowledge and skills they have learned in English, not only in all learning areas, but also in a range of real-world situations.

The curriculum is supported by rigorous formative assessment advice in the English Online site (NZME, 2018k) and the Learning Progression Frameworks within the *Progress and Consistency Tool* (PaCT) (2018j).

Comparative Analysis

Effective national language curricula integrate and interrelate the modes of the language in dynamic ways that reinforce key fundamental skills and provide the opportunities for critical and creative thinking. The difference between AC: E and NZC: E is less in intent or coverage and more in structure and approach. Both curricula are built around the recursive nature of language learning and acknowledge the expected intellectual growth and maturation of students as they increase and expand their knowledge, understandings and skills in working with English. The two curricula have similar expectations of students' reading and writing achievement with the key difference being that one is a curriculum that aims to provide teachers with the content students need to learn across a year and a brief overview of yearly achievement. The other provides two yearly bands with an expectation that the teaching is based on the learning needs of students not the year level content. To do this the curriculum incorporates an array of resources and support materials that also allow for flexible and targeted delivery.

In reading and writing, both curricula expect students to independently read an extensive range of complex texts using a comprehensive range of skills and strategies, to explore how language varies according to context, and to create well-structured texts using appropriate language forms and features for a range of purposes. While there are differences in the detail and specificity of content in the two curricula, the reading and writing demands are similar.

Speaking and listening underpin learning not just in literacy but in all learning areas. In NZC: E, speaking and listening are integrated throughout the framework. In AC: E at Year 6, content statements specify that students participate in class discussions to develop arguments, evaluate information and express opinions, using appropriate voice pitch and volume. Even within the more detailed Literacy Learning Progressions the emphasis is on reading and writing. The Literacy Online curriculum support information recognises a "reciprocal relationship between oral language and literacy learning" and points teachers to a resource *Learning through Talk*, although it does not include clear expectations of students' oral language proficiency.

Another point of divergence in the two curricula is in the area of multimodal texts. The NZC: E does not designate particular learning outcomes to multimodal texts. The AC: E states that students will study media texts and "view, interpret and evaluate... multimodal texts". The Year 6 Level Description articulates the expectations for student achievement in speaking and listening. Students are expected to understand how audience and context impact the use of oral language and the ways they can regulate their listening for learning or social purposes.

Year/Grade Level

Australian Curriculum: Year 10

New Zealand Curriculum: Levels 5 and 6¹⁰

Learning Area/Subject

Australian Curriculum: English (AC: E)

New Zealand Curriculum: English (NZC: E)

Expectations: Knowledge and Skills

For Year 10 students, AC: E continues to develop 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.

The AC: E seeks to improve Year 10 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 and 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.

The AC: E Year 10 curriculum reveals a shift away from the development of core literacy skills towards 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 the expectation that students will already have mastery over most essential literacy skills such as spelling, punctuation and paragraphing. The view is that by the middle secondary years the 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.

As the nationally mandated NZC is a single succinct document incorporating each learning area there is an expectation that each school will develop a more detailed school based local curriculum that reflects the national framework. The New Zealand Curriculum sets the direction for teaching and learning in the learning area of English, but it is a framework rather than a detailed plan. This means that while every school curriculum must clearly be aligned with the intent of the framework, schools have considerable flexibility to create local, contextually specific curricula. In doing this, they can draw on a wide range of ideas, resources, and models. (NZME, 2007a, p. 37)

After 10 years of schooling most New Zealand students will have completed Level 5 and will be working toward Level 6 of the English curriculum. As Levels 5 and 6 continue the developmental sequence from earlier levels students are working towards similar, and sometimes identical achievement objectives, for example the objective "show an understanding of ideas within, across, and beyond texts" appears at both Level 5 and Level 6. At Level 6 there is an increased level of sophistication and complexity in both the texts students read and the texts they create. Levels 5 and 6 emphasise academic challenge,

¹⁰ For further information about comparative points in this study see Section 3.2 Comparative study: Method

application of skills and understandings and working with texts that cover a wide range of topics and themes. The curriculum approaches ongoing reading and writing development as a vehicle for students to develop their critical and creative thinking skills and apply their knowledge and skills in an integrated manner to locate, analyse, evaluate, and synthesise information and ideas to shape their thinking and communicate ideas as evidenced by objectives such as “integrate sources of information, processes, and strategies purposefully and confidently to identify, form, and express increasingly sophisticated ideas”. Often, the curriculum states that the main purpose of students’ reading and writing is to support learning in other subject disciplines, “use language and text forms flexibly to meet the demands of different curriculum areas”. By the end of Level 5 students are meeting the demands of the highest level of the Literacy Learning Progressions.

Measurement of Curriculum: Breadth, Depth and Rigour

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

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 apply the increasingly sophisticated skills from the Language strand to listen to, read, comprehend and create texts, using both conventional and digital tools.

NZC – Breadth

Breadth: Fundamental

At Levels 5 and 6 NZC: E curriculum continues the conceptual pathway established in earlier levels, developing knowledge and skills in the areas of listening and speaking, reading, writing, and viewing and representing. By the end of Level 5 students have a well-developed range of content knowledge, a comprehensive skill set in all aspects of English and a comprehensive range of skills and experiences in understanding and using the English language. At Levels 5 and 6 the achievement objectives continue to be very broad and rely on the range of additional resources to give a thorough picture of the breadth of the curriculum.

With the inclusion of the standards and supporting resources such as the Literacy Learning Progressions, the breadth is **fundamental** as there are aspects of English that have limited coverage. For example, information about the study of literature is limited, and there are few explicitly stated expectations that students will cover the full breadth of formal and informal spoken texts for a range of purposes and audiences. The coverage of reading and writing is comprehensive with detailed explanations of the full range of skills and strategies that students will be learning and applying. The reading and writing elements of the curriculum are also supported by a range of examples of how particular achievement objectives can be taught and assessed. There is emphasis on the developmental progression of reading and writing to support learning across the curriculum.

AC – Depth

Depth: Challenging

The depth of AC: E is deemed to be **challenging**, based on the rich core content that is considered foundational to a strong secondary curriculum. Year 10 students build 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 literary, media and digital texts that provide insights into society, culture and politics. This is achieved through deep knowledge of structures, forms and devices. Students are expected to create a range of texts in forms including digital texts that use hybrid structures to affect and influence the reader. They investigate and create texts, explore rich and diverse themes from both the real and imagined worlds and demonstrate deep knowledge of specialised topics. By Year 10, students are analysing complex English concepts such as ‘intertextuality’ and ‘voice’, involving the application of deep, specialised knowledge.

NZC – Depth

Depth: Challenging

The NZC: E at Levels 5 and 6 is **challenging** in depth as it requires students, including those working towards the National Certificate of Educational Achievement (NCEA) qualification, to use their knowledge and skills in reading and writing to develop and shape their learning. Students need deep knowledge and understanding of the constructs of English and a sophisticated battery of language techniques to successfully manipulate language to suit audience and purpose. The curriculum requires that students interpret and evaluate technical and abstract texts, and make connections within and between texts, to modify and refine conceptual understandings in English and other subject disciplines. When the key concepts at the centre of English study at Level 6 are included, students explore their personal and cultural identities through text. They are deepening their understanding of their own and other’s societies through research and close critical study.

Composing texts at secondary school level is a complex process that involves a range of complementary thinking and composing skills, as well as drawing on other modes of language including reading, speaking, and listening. Students studying Levels 5 and 6 of the curriculum are engaged in deep learning as they evaluate form, style, and organisation of a variety of texts and apply their knowledge of language forms and features. Creating texts at Levels 5 and 6 requires deep knowledge and understanding. Students at this level are also using their deep knowledge to differentiate language registers according to audience and include text features that complement the complex and diverse ideas they are communicating in English

and content from other disciplines. They are demonstrating control over academic language appropriate for debates and essays, the narrative language of stories and novels, the figurative language of poetry and the technical language of instructions and explanations and use their deep knowledge to use language registers and vocabulary to impact readers and viewers.

AC – Rigour

Rigour: Challenging

The level of rigour expected in AC: E is evident in the expectation that students 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 that tend to focus on themes and issues from the Asia-Pacific region. In AC: E, at this level, there is an expectation that students' written texts will be expansive and complex, and that they will have an impact on the reader. Students demonstrate critical understanding of themes and issues presented in texts that include high levels of abstraction. They develop an understanding of the ways in which contemporary media may represent complex social and political issues. Drawing on this evidence, the curriculum can be deemed demanding and **challenging**.

NZC – Rigour

Rigour: Challenging

The rigour in learning English in NZC: E at Levels 5 and 6 is **challenging** and students can use language accurately and fluently for a range of purposes in both English and broader curriculum contexts. In many of the curriculum documents the flexibility and adaptability of the curriculum is stressed, supporting the contention that rigour in a curriculum includes aligning the curriculum to students' needs and interests. The NZC: E is used by schools to achieve the difficult goal of establishing high expectations and high standards while also ensuring the curriculum, particularly at Level 5 is still accessible and engaging for all students. The inclusion of two the key concepts of identity and communication at Level 6 further develops the personalised nature of language acquisition and application at this level. By Levels 5 and 6 NZC: E students are using language accurately and fluently in an expanding range of situations. They are also expected to assume responsibility for their own learning and to apply their language skills in more challenging and complex ways to make personal, social and cultural "connections within, across, and beyond texts and to understand more subtle connections within a range of contexts". The achievement objectives state that students are producing "work that is longer, more intricate, more in-depth, and more crafted" requiring rigorous engagement and application (NZME, 2018).

Comparative Analysis

After studying NZC: E to Levels 5 and 6 students are expected to be effective readers who not only grasp the ideas communicated in texts but are able to apply them in new contexts. They are expected to think creatively and critically about the ideas and information encountered in texts in order to understand, analyse, and absorb them and to recognise their relevance in other contexts. These overarching reading expectations parallel closely with the demands of AC: E at Year 10 where students are "justifying their own interpretations of texts and evaluating other interpretations, analysing the evidence used to support them". In both AC: E and NZC: E, students are expected to independently apply a range of comprehension strategies as they read a wide variety of texts to expand their understandings of the broader

world, as exemplified in statements such as AC: E “Choose a reading technique and reading path appropriate for the type of text, to retrieve and connect ideas within and between texts” and NZC: E “find, select, and use a range of texts for specific learning purposes in different areas of the curriculum, making decisions, as they read, about the usefulness of the text for the purpose”.

The AC: E emphasises the benefits of the study of literature to expand students’ intellectual horizons and extend their repertoire of literacy skills. Students are expected to study a range of Australian and international literature to investigate human experience, and to consider important questions about the human condition and Australian culture, now and in the past. The NZC: E does not draw such explicit parallels with New Zealand culture, but it does expect that the “cultural perspectives of the learner” and local and community texts will be incorporated in the program of study. As students study both local and world literature they increase their knowledge of accomplished writers and literary works. Students develop an appreciation not only of authorcraft, but also of the value of literature in broadening their understanding of cultures, values, significant historical events and the limitless dimensions of human thought and experience.

The AC: E Year 10 level description states that students will “explore themes of human experience and cultural significance, interpersonal relationships, and ethical and global dilemmas within real-world and fictional settings and represent a variety of perspectives”. It includes content descriptors that develop students’ personal skills in examining the concepts, the themes and the language forms and techniques used by a range of literary authors. The NZC: E captures similar learning in its explanation of the key themes including “English is about connecting with others and their ideas and communicating our own” and “English is about exploring our identities and building relationships” (NZME, 2018l).

Both curricula have similar demands in the knowledge and language processes students will acquire although they are more detailed and explicitly stated in AC: E.

b) Learning area: Mathematics

Comparative Curricula

Australian Curriculum

Version 8.3, 2016

New Zealand Curriculum

2007

Year/Grade Level

Australian Curriculum: Year 2

New Zealand Curriculum: Levels 1 and 2¹¹

Learning Area/Subject

Australian Curriculum: Mathematics (AC: M)

New Zealand Curriculum: Mathematics and Statistics (NZC: MS)

This section is a comparative study of the AC: Mathematics and The NZC: Mathematics and Statistics. All references in this section are sourced from the curriculum documents AC: F-10: Mathematics (ACARA, 2018b), The NZC: Mathematics and Statistics (NZME, 2014e) and The NZC: Achievement objectives by learning area (2007d), unless otherwise stated.

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 AC: M incorporates content across the three strands of Number and Algebra, Measurement and Geometry and Statistics and Probability. Elaborations are aligned to each content description but are not mandatory. The elaborations support teachers to clarify the content and offer suggested teaching strategies.

The inclusion of the proficiencies of understanding, fluency, problem-solving and reasoning in the curriculum enable 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 those expected actions in relation to the content descriptions. They are an integral part of Mathematics content across the three content strands. They reinforce the significance of working mathematically within the content and describe how the content is explored or developed, provide the language to build in the developmental aspects of the learning of Mathematics, and are intended to underpin pedagogy in Year 2.

In AC: M 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

¹¹ For further information about comparative points in this study see Section 3.2 Comparative study: Method

describe outcomes for everyday events and collect, organise and represent data to make simple inferences and make sense of collected information.

The NZC: MS makes a clear distinction between the disciplines of Mathematics and Statistics, noting that they relate to one another but differ in the thinking and problem-solving processes involved. In making this distinction, The NZC: MS emphasises the relationship between the two disciplines while observing that Mathematics is concerned with quantities, space and time whereas Statistics is concerned with data. In defining the two disciplines, The NZC: MS notes that both involve the “exploration and use of patterns and relationships and they equip students with effective means for investigating, interpreting, explaining and making senses of the world in which they live” (NZME, 2014e).

The NZC: MS is structured around learning area achievement objectives. Presented in three strands; Number and Algebra; Geometry and Measurement; and Statistics, the achievement objectives are grouped within eight levels of learning. The content strands consist of sub-strands that provide the key ideas under which the achievement objectives are identified. Each level contains a Venn diagram that indicates the pacing or percentage of time to be spent in each strand for that specific level. Every level is prefaced by the statement “In a range of meaningful contexts, students will be engaged in thinking mathematically and statistically. They will solve problems and model situations that require them to...” (NZME, 2014e).

Prior to 2018, NZC: MS also had National Standards which were year-based standards for Mathematics and Statistics that pertained to students’ first eight years of schooling. The standards were implemented in 2009 and were built on the same strands and outcomes of NZC: MS. The standards emphasised the need for students to develop knowledge and understanding of curriculum content but also be provided the opportunity to problem solve and model using authentic real-world situations (NZME, 2009c). Each standard identified the expectations for each year level and aligned to the curriculum levels within NZC: MS. The Mathematics and Statistics learning area and the *Numeracy Development Projects*¹² (NDP) frameworks underpinned the National Standards and although they are no longer reported against¹², they have been considered in this comparative study to provide scope and guidance in making judgements around depth and rigour.

The standards required a judgement of progress. Teachers made overall teacher judgements and over time were also supported by the *Mathematics Learning Progression Framework* (LPF) which also underpinned the PaCT Tool. This framework (NZME, 2015d), provides an evidence-based illustration of the learning progressions students take towards developing expertise in Mathematics from Years 1 - 10. Although not mandated, the NZME strongly suggests the use of the framework in formatively assessing student progress through NZC: MS. The PaCT digital assessment tool (NZME, 2018j) was developed to support dependable judgements and it is used by some NZ schools¹³. The LPF supports NZC: MS in the same way the *National Numeracy Learning Progressions* (NNLP) (ACARA, 2018i) support AC: M and will be treated in this comparative study accordingly.

¹² National Standards were removed by the NZ Government in December 2017 (NZME, 2017b)

¹³ Approximately 30 per cent in 2018 [Personal communication, NZME, 2019].

The NDP knowledge and strategy frameworks were integral to the development of NZC: MS, particularly in the strand of Number and Algebra, and are used in New Zealand classrooms to assist in the implementation of NZC: MS. Taking this into consideration the Number framework was also used in this comparative study to provide a more granular comparison between NZC: MS and AC: M. The NZC: MS has a marked emphasis on number in the early years. The NDP Number Framework makes a clear distinction between knowledge and strategy. In working through both sections of the framework, it is intended that students will develop ‘number sense’ (NZME, 2008). The eight developmental stages of the Number framework span the learning continuum of counting, additive and multiplicative thinking leading to proportional reasoning. Each stage is a description of the actions that students will demonstrate when at that stage of development.

The NZME produced a mapping document linking NZC: MS to the NDP and to the National Standards (NZME, 2010a). Using this document as a guide, the following table documents the comparative points used for ascertaining breadth, depth and rigour for this comparison:

Table 3. 9 *Comparative points for Year 2 AC: M and NZC: MS*

AC: M	NZC: MS	NZ National Standards	Numeracy Development Projects
Year 2	Levels 1 and 2	After three years of schooling	Stages 4 and 5

After three years of schooling it is anticipated that students will have achieved Level 1 objectives and be working towards Level 2 in NZC: MS. They are expected to solve problems and model situations across each of the strands. ‘Number’ should be the focus for 60-80 per cent of teaching time. Students are learning to become additive thinkers, having consolidated their learning around counting. Students will have been introduced to fractions and are using them interchangeably with whole numbers for simple addition and subtraction problems. Their understanding of place value extends to at least 1000, although working with simple fractions, they have not yet been exposed to tenths, hundredths and thousandths. Students are able to solve problems and model situations requiring them to “measure lengths areas, volumes or capacities, and weights of objects and the duration of events using linear whole number scales and applying basic addition facts to standard units” (NZME, 2014e).

At this level students are able to describe their *personal locations* and *give directions*, using *half-or quarter-turns* of whole number measurements. They can sort objects with justification, based on their spatial features and *represent reflections, translations and rotations by creating and describing patterns*. Students are introduced to the statistical enquiry cycle through *posing and answering questions, gathering, sorting, and displaying category and whole number data* and communicating their findings based on the data. They will also investigate simple situations involving an element of chance, recognise equal and different likelihoods and acknowledge uncertainty. Through interpreting statements made in statistical investigations by other, students will develop their statistical literacy and work towards being able to *interpret displays in context* and *probability activities undertaken by others* (NZME, 2014e).

Measurement of Curriculum: Breadth, Depth and Rigour

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

AC – Breadth

Breadth: Comprehensive

The AC: M covers a diverse number of topics indicative of the nature of this learning area. The concepts and skills of AC: M allows learners to build on the previous learning in Foundation and Year 1 as they continue to develop their number and spatial skills and their ability to interpret data. In terms of breadth of coverage, the expectations of the AC are considered to be **comprehensive**. 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 a number of threads:

- Number and Algebra
- Measurement and Geometry
- Statistics and Probability.

There are also 42 elaborations which, although not mandatory, offer teachers some insight into how the content can be presented to students. These elaborations provide examples and teaching points to develop a common understanding of the expectation of what is to be taught. There are one or more elaborations aligned to each content description.

Table 3. 10 *Number of content descriptions in AC: M, Year 2*

Year 2	Mathematics
Content descriptions	25
Elaborations	42
General capabilities	5
Cross-curriculum priorities	3

NZC – Breadth

Breadth: Fundamental

With regard to breadth, NZC: MS at Levels 1 and 2 are rated as **fundamental**. The NZC: MS achievement objectives for Levels 1 and 2 are expected to span across the first four years of schooling and although having 32 achievement objectives would appear comprehensive, consideration needs to be made that they are the achievement objectives for a four-year period compared to the 12-month duration of AC: M Year 2.

The three Mathematical strands of NZC: MS are divided into the following sub-strands; Number Strategies, Number Knowledge, Equations and Expressions, Patterns and Relationships, Measurement, Shape, Positions and Orientation, Transformation, Statistical

Investigation, Statistical Literacy and Probability. Each sub-strand contains between one and four achievement objectives.

Elaborations for each of these achievement objectives are provided by the NZME and published on the nzmaths website as a supporting resource. Along with the elaborations, key ideas for each of the sub-strands have also been identified at each level of NZC: MS. The standards, although no longer reported against, provide an expectation of what students should be achieving after three years of schooling. The standards are supported by examples which are tabulated below.

Table 3. 11 *Number of achievement objectives in NZC: MS, Levels 1 and 2*

Level 1 and 2	Mathematics
Achievement Objectives	32
Elaborations	32
Key Ideas	22
Standards	13
Examples	9

In making a judgement on the overall breadth of NZC: MS, pacing was considered based on the key ideas within the achievement objectives and in using the NDP as a comparison to the curriculum thread of the 'Number and Place value' sub-strand in AC: M. With 22 key ideas spanning Levels 1 and 2, this would equate to an average of 5-6 key ideas per year, given the expectation of students meeting the Level 2 objectives after four years of schooling. In AC: M the key ideas are articulated within the standards for Year 2. There are 16 key ideas within AC: M Year 2 standard in comparison to the equivalent 5-6 per year for NZC: MS, deeming AC: M to have a greater breadth than NZC: MS.

AC – Depth

Depth: Challenging

The expectations of AC: M in terms of depth are **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. *Understanding* 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, and at this year level, implies counting numbers in sequences, using informal units iteratively to compare measurements, describing outcomes of familiar chance events making comparisons. These statements define the range and nature of the expected actions in relation to the content descriptions. The depth of curriculum 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 verbs of 'create', 'investigate' and 'compare'.

NZC – Depth

Depth: Challenging

In relation to depth of learning, the expectations of NZC: MS at Levels 1 and 2 are assessed as **challenging**. The statements for each level within the curriculum state “In a range of meaningful contexts, students will be engaged in thinking mathematically and statistically. They will “solve problems and model situations that require them to...” (NZME, 2009c). The *Number and Algebra* strand is covered in more depth than the other two strands at these levels. In reviewing the sub-strands in Number and Algebra *number strategies* and *number knowledge* indicate that students are expected to develop the knowledge as well as the application of content, providing a depth of understanding that supports mathematical proficiency (Kilpatrick, Swafford, & Findell, 2001). Considering the mapping of the NDP Number Framework to Level 1 and Level 2 of NZC: MS, it is also apparent that Number is covered in great depth, ensuring that students gain the necessary conceptual understanding of ‘one to one counting’ to ‘trusting the count’ before moving on to ‘additive thinking’ and not moving into ‘multiplicative thinking’ until Level 3 and Level 4 of NZC: MS. Evidence supports that a child’s numeracy development is evident in their counting skills and that connections have been made between numeracy skills of younger students and their achievement in the later years (Reid, 2016).

The inclusion of verbs throughout NZC: MS such as ‘use’, ‘sort’, ‘find’, ‘identify’ and ‘conduct’ all indicate an expected level of fluency. Whereas the inclusion of the verbs ‘communicate’, ‘describe’, ‘compare’, ‘generalise’, ‘predict’, as with AC: M, indicate an expected level of higher order thinking and mathematical reasoning, adding to the challenging depth of the curriculum. The strand of Statistics has been divided into three sub-strands of *Statistical investigation* and *Statistical literacy* and *Probability*. This differentiation between literacy and investigation would suggest that in learning statistics at Level 1 and Level 2, students are exposed to the statistical investigation process as well as its various components. The achievement objectives for *Probability* require students to “investigate situations”, “anticipate possible outcomes” and “acknowledge uncertainty” indicating an expected in-depth level of conceptual understanding as well as procedural competence.

AC – Rigour

Rigour: Challenging

The level of rigour in AC: M was regarded as **challenging** due to the 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 which identifies how the problem-solving and reasoning proficiencies are embedded in the curriculum. For Year 2 students, 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’, which requires higher-order thinking skills and rigorous learning.

NZC – Rigour

Rigour: Challenging

The NZC: MS was regarded as **challenging**, demonstrated by both the meta language used explicitly within the curriculum document and by the elaborations and exemplars that provide support for its implementation. A prescribed level of higher-order thinking is required by students when learning Mathematics and Statistics in The NZC which can be exemplified by the elaboration for the achievement objective S1-3; “investigate situations that involve elements of chance, acknowledging and anticipating possible outcomes”. In expecting students to ‘acknowledge’ and ‘anticipate’ emphasises the requirement of thought and reasoning. The elaboration states, “This means students will consider the possible outcomes of events. The possible outcomes should be the basis for predictions rather than perceptions of luck” (NZME, n.d.-a). The exemplars of student performance, second-tier material, that further support this objective include examples of students’ predicting, experimenting and justifying their decisions. Included in this supporting document under ‘Important teacher ideas’ it states “At Level 1 students learn to question their subjective predictions about outcomes by comparing these predictions to the actual outcomes of events” (NZME, n.d.-b). In the strand of *Geometry and Measurement* an achievement objective for Level 2 is “Create and use appropriate units and devices to measure length, area, volume and capacity, weight (mass), turn (angle), temperature, and time” (NZME, n.d.-c). Supporting documents state that the key idea for Level 1 here is comparison and for Level 2 it is choosing appropriate units and creating their own measurement instruments. Although no longer reported against, the National Standards also provide strong support for deeming the rigour as challenging with the inclusion of words such as ‘create’, ‘describe’, ‘interpret’ and ‘compare’ throughout all strands.

As mentioned in the measurement of depth for NZC: MS, the *Statistics* strand articulates that students will ‘interpret’ and ‘compare’ statements indicating an emerging level of critical thinking.

Comparative Analysis

Making an accurate comparative analysis of NZC: MS and AC: M has challenges given that NZC: MS is a curriculum framework, built on 8 levels of achievement objectives that span 13 years of schooling. The AC: M is a year-based curriculum containing content and standards for each year of schooling F-10. Taking this into consideration, the comparative point of Year 2 AC: M was determined to sit between Levels 1 and 2 of NZC: MS. Prior to 2018 the New Zealand National Standards were used as a benchmark in determining which specific outcomes were relevant for analysis, given that the National Standards were aligned to NZC: MS and were set as year-based measures of achievement.

The AC: M and NZC: MS are comparable in their achievement objectives, curriculum content and measurable standards. It is noted that students who completed Year 2 in AC: M would have completed Level 1 and be working towards the Level 2 objectives of NZC: MS. Taking this into consideration the expected developmental levels within NZC: MS are slightly less rigorous than AC: M for this age group. The pace of NZC: MS indicates that more time and emphasis is placed on the consolidation of early number sense, ensuring that students progress towards additive thinking prior to being introduced to multiplication and division. The NZC: MS has more depth in the coverage of early number than AC: M, whereas AC: M

introduces multiplication and division to Year 2 students through repeated addition, groups and arrays, giving it more breadth than NZC: MS at this level.

The proficiency strands of AC: M form an integral part of the curriculum implementation and are clearly articulated within the Year 2 level description. However, in the Year 2 standard there is no explicit expectation that students can 'problem solve', and the skills associated with mathematical reasoning are only articulated through the statistics strand in *making simple inferences*. In contrast NZC: MS achievement objectives for both Levels 1 and 2 begin with the statement "In a range of meaningful contexts, students will be engaged in thinking mathematically and statistically. They will solve problems and model situations that require them to..." (NZME, 2014e).

As with AC: M, the NZME has produced exemplars (work samples) for NZC: MC designed to illustrate the behaviours expected at various levels across the Mathematics curriculum. The AC: M also provides student work samples as a resource to support the implementation of AC: M, designed to assist teachers in making valid judgements about students' performance against the Year 2 standard. In comparing the two resources, the expected levels of achievement indicate that both curricula require students to demonstrate a comparative level of understanding and procedural fluency to meet the standard. However, in NZC: MS, Levels 1 and 2 require a higher degree of statistical reasoning than is expected at Year 2 of AC: M.

Year/Grade Level

Australian Curriculum: Year 6

New Zealand Curriculum: Levels 3 and 4¹⁴

Learning Area/Subject

Australian Curriculum: Mathematics (AC: M)

New Zealand Curriculum: Mathematics and Statistics (NZC: MS)

Expectations: Knowledge and Skills

There is an expectation within AC: M that students will be exposed to the content of the Year 6 curriculum through rich tasks and experiences that allow students to demonstrate mathematical proficiency. The proficiency strands are an integral part of Mathematics content across the three content strands: *Number and Algebra*, *Measurement and Geometry*, and *Statistics and Probability*, reinforcing the significance of working mathematically within the content and describing how the content is explored or developed. They provide the language to build in the developmental aspects of the learning of Mathematics and are intended to underpin how teachers teach the mathematical content in Year 6.

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. They are introduced to negative numbers through practical applications in areas such as temperature. 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 decimals 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.

As NZC: MS is a curriculum framework based on eight levels of learning that span 13 years of schooling, for this comparative study it was deemed appropriate to map Year 6 of AC: M to Levels 3 and 4 of NZC: MS. There is an expectation in NZC: MS that through studying Mathematics, students will “learn to create models and predict outcomes, to conjecture, to

¹⁴ For further information about comparative points in this study see Section 3.2 Comparative study: Method

justify and verify, and to seek patterns and generalisations. They learn to estimate with reasonableness, calculate with precision, and understand when results are precise and when they must be interpreted with uncertainty” (NZME, 2014e).

The NZC: MS is subdivided into three mathematical strands of *Number and Algebra*, *Geometry and Measurement*, and *Statistics*. At Level 3, the *Number and Algebra* strand is further subdivided into the sub-strands of *Number Strategies*, *Number Knowledge, Equations and Expressions*, and *Patterns and Relationships*. In Level 4 of NZC: MS the sub-strands of *Number Strategies* and *Number Knowledge* are combined into one sub-strand which would suggest a reduction in the emphasis of Number as students move to the next level of attainment. Using the Number framework as a guide, students at Level 3 and Level 4 in NZC: MS are at Stage 6 in the number strategy development framework which is a shift from additive thinking into multiplicative thinking (NZME, 2010a; NZME, 2008). Using the supportive documents produced by the NZME and NZC: MS the following table indicates the comparative points used in comparing AC: M Year 6.

Table 3. 12 Comparative points for Year 6 AC: M and NZC: MS

AC: M	NZC: MS	NZ National Standards	Numeracy Development Projects
Year 6	Levels 3 and 4	After seven years of schooling	Stages 6 and 7

At Level 3 and Level 4 of NZC: MS, there is an expectation that students will be exposed to, and their achievement be measured against, the objectives “in a range of meaningful contexts, students will be engaged in thinking mathematically and statistically. They will solve problems and model situations” (NZME, 2014e). Students are expected to develop their algebraic thinking and generalise patterns to form relationships as they move towards identifying and solving linear equations. They move from classifying two-dimensional shapes into identifying three-dimensional objects and their two-dimensional representations. They are familiar with fractions, decimals and percentages and can use them in a variety of contexts and in problems presented across the three strands.

Measurement of Curriculum: Breadth, Depth and Rigour

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

AC – Breadth

Breadth: Comprehensive

With regard to topic coverage, the expectations of AC: M are deemed to be **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:

- 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 AC: M, provide additional information for teachers to assist with teaching strategies, links to the general capabilities and cross-curriculum priorities or further clarification of the content description. One or more elaborations will be linked to each content description in Year 6.

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

Table 3. 13 *Number of content descriptions in AC: M, Year 6*

Year 6	Mathematics
Content descriptions	27
Elaborations	46
General capabilities	5
Cross-curriculum priorities	3

NZC – Breadth

Breadth: Comprehensive

Although consideration was given to the fact that Level 3 and Level 4 of NZC: MS spans four years of schooling, the breadth of the achievement objectives and the previously used National Standards has increased giving a more **comprehensive** coverage of curriculum content than in the earlier levels. Although the key ideas have remained on average five or six per year, each key idea covers a broader range of content than in comparison with AC: M and incorporates several smaller ideas within one overarching statement.

Table 3. 14 Number of achievement objectives in NZC: MS, Level 3 and Level 4

Levels 3 and 4	Mathematics
Achievement Objectives	38
Elaborations	38
Key Ideas	21
Standards	17
Examples	9

During Level 3 and Level 4, students are expected to move from additive thinkers into multiplicative thinkers with emerging skills in proportional reasoning. In *Geometry and Measurement* they move from linear two dimensional measurement scales to volume and capacity of three dimensional objects. The shift from thinking two dimensionally to three dimensions is also evident in the dealing with *Shape*. By the end of Level 4, students should be able to demonstrate two dimensional representations of three-dimensional objects. In *Statistics*, as at Level 1 and Level 2, students explore through the investigation process as well as developing statistical literacy and probabilistic thinking skills.

AC – Depth

Depth: Challenging

In relation to depth in Year 6, AC: M was 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: M show a range of cognitive demand, and the understanding and fluency proficiencies describe the depth of the curriculum. *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 are required to describe connections between concepts they have learnt and 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’. The use of these verbs included in the content descriptions requires considerable in-depth exploration of concepts and justifies the high rating regarding depth of learning. The selective employment and training in the use of calculators complements and extends the range and depth of content.

NZC – Depth

Depth: Challenging

As with the previous levels of NZC: MS, Level 3 and Level 4 are premised by the statement, “In a range of meaningful contexts, students will be engaged in thinking mathematically and statistically. They will solve problems and model situations that require them to...” This indicates an expectation that students will demonstrate more than just procedural fluency of attained content knowledge, but also engage in authentic problem-solving exploring the content through meaningful situations. Language such as ‘know’, ‘apply’, ‘understand’, ‘use’, ‘communicate’ and ‘investigate’, again provide an expectation of the required depth students are to explore the key ideas contained within the Level 3 and Level 4 NZC: MS. The

achievement objectives also explicitly articulate the use of multiple representations of number across the various strands such as “Use simple fractions and percentages to describe probabilities; Understand addition and subtraction of fractions, decimals and integers; Find fractions, decimals and percentages of amounts expressed as whole number, simple fractions and decimals”. As with the previous levels, students are expected to use the ‘statistical investigation’ cycle while developing their statistical literacy and applying their understanding to make comparative and evaluative judgements.

The inclusion of multiple representations and modes for demonstrating understanding also adds to the determination of a **challenging** depth for NZC: MS at this level; for example, “Use graphs, tables and rules to describe linear relationships found in number and spatial patterns” (NZME, 2014e). Although not mandated, the achievement objective elaborations provide scope for the level of depth students are expected to achieve in NZC: MS. Multiple representations of concepts set within a rich problem-solving context provides students with a **challenging** curriculum content.

AC – Rigour

Rigour: Challenging

The rigour of 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 reasoning description, which includes explaining mental strategies for performing calculations, describing results for continuing number sequences, explaining transformations and why the results of chance experiments may differ from expected results. The content descriptions at Year 6 require higher-order thinking skills, 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 also to “interpret secondary data presented in digital media and elsewhere”. The content descriptions define the expectations of the students to be able to do more than procedural calculations and computations. The verbs used at the beginning of each content description imply higher-order thinking. Verbs such as ‘investigate’ and ‘calculate’, ‘continue’ and ‘create’, ‘explore the use of’, ‘interpret and use’, and ‘investigate combinations’ reveal the intent of the learning to be challenging and investigative.

The achievement standard defines what a typical student should be able to achieve by the end of Year 6 and states that 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”. Higher-order mathematical thinking is a feature of the standards, which supports the high rating.

NZC – Rigour

Rigour: Challenging

The NZC: MS at Level 3 and Level 4 is deemed rigorous. Language used within the achievement objectives indicates the expected high level of learning which can also be mapped to the previous National Standards. Action words such as ‘use’, ‘convert’, ‘record’ and ‘classify’ are interrelated by more higher order thinking terms such as ‘interpret’, ‘form’,

'evaluate', 'generalise' and 'connect'. As with the previous levels of NZC: MS, the treatment of Statistics within the curriculum is very rigorous. The sub-strands of *Equations and Expressions* and *Patterns and relationships*, at Level 3 and 4 include achievement objectives that go beyond the comparative AC: M Year 6 with the learning of linear relationships. This does not appear in AC: M until Year 7 when the use of variables in algebraic relationships are introduced. The NZC: MS requires students to move to a level of abstraction that is challenging at this comparative age.

The achievement objectives for Statistics at both Levels 3 and 4 were classified as **challenging** for a student having attended 7 years of schooling. Students are expected to demonstrate achievement through using the 'statistical investigation cycle' and apply it to authentic investigation such as, "investigate situations that involve elements of chance by comparing experimental distributions with expectations from models of the possible outcomes, acknowledging variation and independence" (NZME, 2007d, p. 19).

Comparative Analysis

The AC: M and NZC: MS are comparable at this point of learning in both breadth and depth of the curriculum. However, there were a few significant differences. For example, in AC: M, Year 6 students are expected to recognise the properties of specific number sets in that they "Identify and describe properties of prime, composite, square and triangular numbers". This does not appear in either Levels 3 or 4 of NZC: MS achievement objectives. Students in Level 4 of NZC: MS are expected to "form and solve simple linear equations" and "use graphs, tables, and rules to describe linear relationships found in number and spatial patterns", whereas students are not introduced to linear algebra until Year 7 in AC: M and in AC: M Year 8 standard it states, "they solve linear equations and graph linear relationships on the cartesian plane".

Differences also exist in the treatment of statistics. In AC: M students focus on the interpretation of data based on visual representations. They "interpret and compare a variety of data displays including those displays for two categorical variables and they interpret secondary data displayed in the media". In contrast NZC: MS, as it does throughout the curriculum levels, has an additional sub-strand called *Statistical Investigation*, which requires students to partake in statistical investigations using the statistical enquiry cycle. As they progress from Level 3 to Level 4 the sophistication of their statistical enquiry increases as they shift from merely "gathering, sorting, displaying, identifying trends and communicate their findings, to determining appropriate variables, choosing data collection methods, comparing distributions using multivariate data". Again, this level of sophistication in statistical enquiry does not occur in AC: M until Year 8 where students are expected to "explain issues related to the collection of data and the effect of outliers on means and medians of data" and Year 9 where "students compare techniques for collecting data from primary and secondary sources and describe and interpret multivariate data".

Another interesting difference is that AC: M explicitly states *with and without technologies* and the use of *appropriate technologies* within several of its content descriptions such as, "Investigate and calculate percentage discounts of 10%, 25% and 50% on sale items, with and without digital technologies". Both curricula were determined, on balance, to have **challenging** depth and rigour and a **comprehensive** breadth at this comparative point.

Year/Grade Level

Australian Curriculum: Year 10

New Zealand Curriculum: Levels 5 and 6¹⁵

Learning Area/Subject

Australian Curriculum: Mathematics (AC: M)

New Zealand Curriculum: Mathematics and Statistics (NZC: MS)

Expectations: Knowledge and Skills

In comparing Year 10 AC: M to NZC: MS, both Level 5 and Level 6 of the achievement objectives were considered, with an expectation that students will have achieved the objectives of Level 5 and be working towards the objectives of Level 6. The challenge in providing an accurate comparison for the breadth, depth and rigour at this age level, is that New Zealand students in Year 11 may be studying Senior Secondary studies, whereas in Australia at the equivalent age level of Year 10, it is the last year of study prior to entering Senior Secondary. Secondary school is only compulsory in New Zealand until 16 years of age and then students can choose to enrol in Year 11 NCEA. In Australia, Senior Secondary studies are governed by the various States and Territory jurisdictions. As a result, Year 10 AC: M equates to 11 years of schooling, and under NZC: MS students are in Level 1 of the NCEA. This will be taken into consideration when determining the depth and rigour of NZC: MS. The NZ National Standards and the NDP Number Framework, used in the previous level comparisons, only extend to the first 8 years of schooling and were therefore not applicable to this comparison.

The AC: M maintains its three-strand structure for all Year 10 students, but also provides an optional, more challenging, set of content descriptions for students planning to take on a calculus-based subject in Years 11 and 12. This content is contained within the 10A AC: M curriculum content and it is included in this comparative study as the comparative points used for Mathematics are both NZC: MS Level 5 and Level 6.

In AC: M 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.

¹⁵ For further information about comparative points in this study see Section 3.2 Comparative study: Method

The NZC: MS also incorporates three strands *Number and Algebra*, *Geometry and Measurement*, and *Statistics* at Level 5 and Level 6 which mesh into two strands of Mathematics and Statistics by Level 7 and Level 8. As students move to the next level of learning, the pacing guide also changes with a more equal expectation of time to be spent on each strand. Compared to Levels 1 and 2 where up to 80 per cent of time is expected to be spent on *Number and Algebra*, by Level 6, *Geometry and Measurement*, and *Statistics* receive an equal weighting within the curriculum. Level 6 also includes indicators and content elaborations with achievement objective links (NZME, 2012c). The following table demonstrates the comparative points used for this part of the study.

Table 3. 15 Comparative points for Year 10/10A AC: M and NZC: MS

AC: M	NZC: MS	National Certificate in Educational Achievement
Year 10 / 10A	Levels 5 and 6	Level 1

Level 6 of NZC: MS includes key concepts, or big ideas and the aim is for students to develop an understanding on completion of this level. Change and variations, structure and generalisation, argumentation and proof are the key concepts for Mathematics and Statistics in NZC: MS for Level 6 and beyond. “Students need time and opportunity to explore these concepts, to appreciate the breadth, depth, and subtlety of meaning that attaches to them, to learn that different people view them from different perspectives, and to understand that meaning is not static. By approaching these concepts in different ways and by revisiting them in different contexts within a relatively short time span, students come to refine and embed understandings” (NZME, 2012d).

Measurement of Curriculum: Breadth, Depth and Rigour

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

AC – Breadth

Breadth: Comprehensive

For Year 10 students, the expectations of 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*. Each content description is supported by at least one elaboration which provides clarity and teaching ideas to assist teachers. Under the strands, the content is further organized into threads.

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 offers content for students to prepare for the calculus based senior courses in Years 11 and 12 and to be extended with more content to enrich their mathematical study. The table below provides the details.

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. 16 *Number of content descriptions in AC: M, Year 9, Year 10, Year 10A*

AC: Mathematics Years 9, 10 and 10A		
Strand	Content descriptions	Elaborations
Number and Algebra	23/7	34/10
Measurement and Geometry	13/6	20/11
Statistics and Probability	14/3	22/5
Totals	50/16 = 66	76/26 = 102

NZC – Breadth

Breadth: Comprehensive

The NZC: MS at Level 5 and Level 6 was considered **comprehensive** in breadth. In only reviewing the curriculum achievement objectives and elaborations for NZC: MS at Level 5 and Level 6, it is evident that there is an increase in the content covered in Mathematics, as the Level of learning increases. Given that Level 6 is also a component of the Senior Secondary Curriculum, there are additional indicators and context elaborations included for teachers, that support the achievement objectives and provide more of a granular interpretation of the objective. In the Number and Algebra strand alone, there are 35 indicators at Level 6.

Table 3. 17 Number of achievement objectives in NZC: MS, Level 5 and Level 6

Level 5 and 6	Mathematics
Achievement Objectives	43
Elaborations	43
Key Ideas	20
Unit standards	3 (Level 6)
Achievement Standards	13 (Level 6)

Level 6 also carries unit standards and achievement standards set under the NCEA requirements based on the New Zealand Qualifications Framework set by the New Zealand Qualifications Authority (NZQA). The pacing and sequence of NZC: MS at these levels is demonstrated in the table above with the representation of the strands being almost equal in number. This suggests that each of the strands receives equal time and content allocation with a marked increase in *Statistics* and *Measurement and Geometry*, therefore also increasing the breadth of coverage across the strands.

AC – Depth

Depth: Challenging

The AC: M year-level descriptions detail a significant cognitive demand for Year 9/10 students. The expectations are **challenging** at their stage of development in terms of the depth of coverage encompassed by the content descriptions. The Year 10 achievement standards require students to understand and apply mathematics at a level only possible with significant conceptual and skills development within each content sub-strand. Examples include “make the connections between algebraic and graphical representations of relations”, and “interpreting and evaluating media statements and interpreting and comparing data sets”.

The Year 10A course is more demanding with content descriptions such as “use the definition of a logarithm to establish and apply the laws of logarithms”, and “investigate reports of studies in digital media and elsewhere for information on their planning and implementation”. The proficiency strands of Problem-solving and Reasoning are evident with Year 10 students provided with the opportunity to “develop the ability to make choices, interpret, formulate, model and investigate problem situations” and “develop an increasingly

sophisticated capacity for logical thought and actions, such as analysing, proving, evaluating, explaining, inferring, justifying and generalising”.

NZC – Depth

Depth: Challenging

The depth of NZC: MS was assessed as **challenging** for students having achieved at Level 5 and working towards Level 6. Students at this level are typically completing their last year of compulsory studies with the option of studying, or they may have started the more challenging Levels 7 and 8 for their Senior Secondary studies. Taking this into account, the New Zealand Senior Curriculum Guides for Mathematics were used in collaboration with NZC: MS achievement objectives to determine the depth of curriculum at this level. The *Senior Secondary Curriculum Guide* for Mathematics has a more granular explanation of the curriculum content, achievement objectives and standards expected at this level.

As a Senior Secondary course of study, students select units at Levels 1-3, based on the standards that are aligned to NZC: MS and used to assess achievement at this level. Level 6 of NZC: MS equates to Level 1 of the NCEA. The Mathematics *Senior Secondary Curriculum Guide*, in discussing the curriculum content strands, states “It is important that students see and make sense of the many connections within and across these strands” (NZME, 2012c). They also include key concepts that they “hope will remain with our students long after they have left school” (NZME, 2010b). The concepts include the big ideas of ‘change and variation’, ‘structure and generalisation’ and ‘argumentation and proof’ (NZME, 2010b). At Level 5 of NZC: MS, the key ideas include developing proportional thinking and reasoning in ‘Number’, investigation quadratic relations in ‘Algebra’ and connecting the visual representation of graphs to their quadratic equations. The increasing complexity of the measurement strand is evident in the key ideas as they move from understanding that all measurement is an approximation in Level 5 to “the concept of the accuracy of a derived measure and the understanding that abstract mathematical formulae may be used to solve problems” (NZME, n.d-d).

AC – Rigour

Rigour: Challenging

The rigour of AC: M for Year 10 was considered to be **challenging** as it places considerable demand on students to engage in reasoning and abstract thinking. The Year-level statement at the beginning of the Year 10 curriculum states:

- **problem-solving** includes calculating the surface area and volume of a wide 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
- **reasoning** includes formulating geometric proofs involving congruence and similarity, interpreting and evaluating media statements and interpreting and comparing data sets.

The intention of AC: M is for teachers to teach the curriculum through the proficiencies, with a particular emphasis on problem-solving and reasoning. To this end, AC: M provides the opportunity for students to apply logical reasoning and to communicate and justify their solutions to both familiar and unfamiliar problems using appropriate mathematical language.

The content descriptions at both Years 10 and 10A require higher-order thinking skills. In Year 10, under *Measurement and Geometry: Geometric Reasoning*, students “Apply logical reasoning, including the use of congruence and similarity, to proofs and numerical exercises involving plane shapes” with elaborations including “communicating a proof using a sequence of logically connected statements” and in the 10A content students further develop their understanding of geometrical proof with “Prove and apply angle and chord properties of circles”. These are challenging content descriptions; students must develop sophisticated thinking skills to be able to work through problems related to this content.

NZC – Rigour

Rigour: Challenging

The language used in the Level 5 and 6 achievement objectives of NZC: MS denotes a rigorous level of higher order thinking, leading to a determination of **challenging**. Words such as apply, extend, form, generalise, relate, deduce, compare, analyse and evaluate provide guidance to teachers as to the expected achievement outcomes of students working at this level. The *Senior Secondary Curriculum Guide* for Mathematics and Statistics articulates “Mathematics and Statistics provides students with opportunities to think flexibly, creatively, critically, effectively, strategically, and logically” (NZME, 2018m).

Level 6 is the minimum achievement standard for New Zealand students obtaining their NCEA and is used as a benchmark for the minimum numeracy required by other discipline areas in Senior Secondary. As with AC: M, there is opportunity for students to develop and demonstrate their mathematical thinking and reasoning with an expectation that they will apply this to solve authentic problems. As with the other levels of NZC: MS, the achievement objectives state that “in a range of meaningful contexts, students will engage in thinking mathematically and statistically. They will solve problems and model situations that require them to...” The NCEA standards that equate to Level 6 in NZC: MS provide further support for the determination of **challenging** when describing the rigour of this curriculum for examples in applying *geometric reasoning in solving problems* includes the expectation that students will use *relational thinking* and extend their *abstract thinking* in solving *real-life* authentic problems (NZQA, 2017).

In both Levels 5 and 6, the expected degree of geometric reasoning sophisticates with students’ deducing, recognising and creating solutions in both two and three dimensions. As students move from Level 5 to 6, their implementation of the statistical enquiry cycle requires them to justify their statistical choices and findings from statistical investigations, evaluating statistical reports and comparing theoretical distributions to experimental data.

Comparative Analysis

To provide an accurate comparison of AC: M Year 10 curriculum to NZC: MS is not straightforward, given the different curricula constructs. New Zealand students may be studying at different levels in Year 11 which, in their 11th year of schooling, equates to Year 10 in the AC. Year 10 is also a compulsory level of study for all Australian students, as the minimum leaving age for students in Australia is 17 years of age. In New Zealand, the minimum leaving age is 16 years of age meaning that the equivalent year of study in New Zealand is not compulsory. It is also noted that Year 10 students in Australia have the option to extend their mathematical studies by covering the Year 10A curriculum content. The aim of the 10A course is to equip students with the necessary underpinning knowledge and skills

required by the more challenging mathematical courses of study in Senior Secondary. Providing a fair comparison of the two curricula, the 10A curriculum content was included in determining the Year 10 depth and rigour and compared to the Level 6 achievement objectives and Senior Secondary standards for NZC: MS.

Both curricula provide students with a comprehensive breadth of coverage at a challenging depth and rigour. Comparatively the inclusion of the proficiency strands in the delivery and assessment of curriculum content in AC: M is matched by NZC: MS expectation that students will demonstrate their achievement objectives through modelling and solving problems *in a range of meaning contexts*. Although not as explicit in AC: M as in NZC: MS, making the links between the various components of mathematics is encouraged in both curricula along with mathematical reasoning. In AC: M supporting texts it states “the curriculum anticipates that schools will ensure all students benefit from access to the power of mathematical reasoning and learn to apply their mathematical understanding creatively and efficiently”. The AC: M at Year 10 includes explicit reference to the use of appropriate digital technologies in several of the content descriptions whereas NZC: MS in its Level 5 and Level 6 achievement objectives does not mention the use of technology. However, when looking at the context elaborations in the Senior Secondary guides, there is evidence that students are expected to use digital technology in learning at this level (NZME, 2012c).

In AC: M, at year 10, the *Number and Algebra* strand is divided into the sub-strands of *Patterns and algebra* and *Linear and non-linear relationships* and no longer covers the sub-strands of *Real numbers* and *Number and Place-value*. In contrast both Levels 5 and 6 of NZC: MS continue to have achievement outcomes for the sub-strand *Number strategies and knowledge*. In looking at the progression of learning and curriculum threads for ‘Number’ across both curricula, NZC: MS pacing of the ‘big ideas’ of ‘Number’ varies to that within AC: M. Below is a table mapping the aspects of number sense against the expected age levels, based on AC: M standard, NZC: MS achievement objectives and using both the *New Zealand Numeracy Development Projects’* (NDP) frameworks and the *Australian Scaffolding Numeracy in the Middle Years* (SNMY) project (NZME, 2010a; Siemon, 2017).

This indicates that in AC: M, multiplication is introduced at an earlier age than in NZC: MS and a smaller amount of time is allocated to developing multiplicative thinking in AC: M than within NZC: MS. The NZC: MS has students partitioning at a similar age to that of AC: M, however, they take longer to develop proportional reasoning within their curriculum if using the previous New Zealand National standards to determine the average age per achievement level.

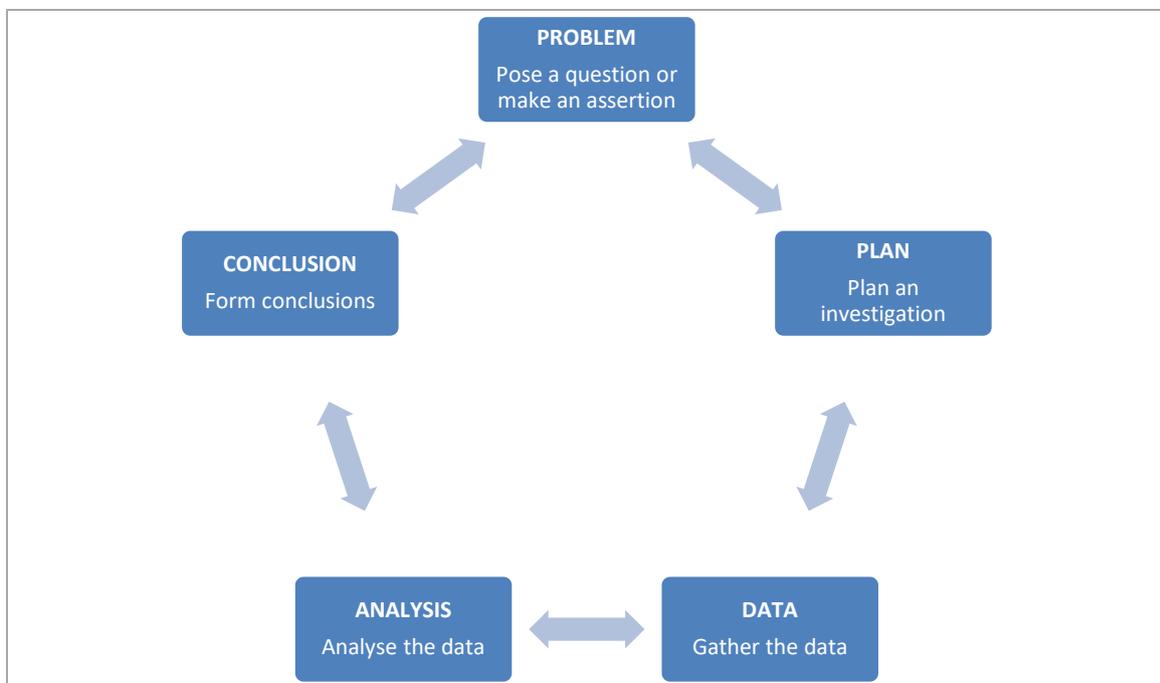
Table 3. 18 ‘Big Ideas’ of number in AC: M compared to NZC: MS

Curriculum	Trusting the count	Additive thinking	Multiplicative thinking	Partitioning	Proportional Reasoning
AC: M	Foundation - Year 1 Age 4 - 6 years	Year 1 - Year 3 Age 6 - 8 years	Year 2 - Year 4 Age 7 - 9 years	Year 2 - Year 6 Age 7 - 11 years	Year 6 - Year 9 Age 11 - 14 years
NZC: MS	Level 1 Age 5 - 6 years	Level 2 - Level 3 Age 7 - 9 years	Level 3 - Level 4 Age 10 - 11 years	Level 2 - Level 4 Age 7 - 11 years	Level 4 - Level 5 Age 12 - 15 years

In conclusion, when comparing NZC: MS and AC: M at this comparative point, both curricula have a challenging depth and rigour that provides the opportunity for students to develop the skills and strategies necessary for everyday life and the thinking skills that can enable them to become critical thinkers when delivered as intended.

Additional Observations

A significant difference between AC: M and NZC: MS is the way in which the strand of ‘Statistics and Probability’ is explored. The NZC: MS names this learning area Mathematics and Statistics rather than having Statistics classified as a strand of Mathematics as it is in AC: M. The sub-strands of the *Statistics* in NZC: M are called *Statistical Investigation*, *Statistical Literacy* and *Probability*. From as early as Level 1 and 2, students are introduced explicitly to the statistical enquiry cycle that New Zealand articulates into five phases as demonstrated in figure 3.1 below:



Adapted from “Statistical enquiry cycle” text by nzmaths: The home of mathematics education in New Zealand, 2018 (<https://nzmaths.co.nz/category/glossary/statistical-enquiry-cycle>). Copyright by the New Zealand Ministry of Education.

Figure 3. 1 The statistical enquiry cycle

In AC: M the *Statistics and Probability* strand is divided into the sub-strands of *Data representation and interpretation*, and *chance*. The curriculum thread and Year level standards support this differentiation with a focus on the representation and interpretation of data rather than the learning progression of developing students’ statistical investigation skills. The NZC: MS uses the words thinking statistically and differentiates this from thinking mathematically by explaining “these two disciplines are related but different ways of thinking and solving problems” (NZME, 2014e).

c) Learning area: Science

Comparative Curricula

Australian Curriculum

Version 8.3, 2016

New Zealand Curriculum

2007

Year/Grade Level

Australian Curriculum: Year 2

New Zealand Curriculum: Levels 1 and 2¹⁶

Learning Area/Subject

Australian Curriculum: Science (AC: S)

New Zealand Curriculum: Science (NZC: S)

This section is a comparative study of the AC: Science and The NZC: Science. All references in this section are sourced from the curriculum documents AC: F-10: Science (ACARA, 2018c), The NZC: Science (NZME, 2014f) and The NZC: Achievement objectives by learning area (2007d), unless otherwise stated.

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, AC: S expects students to describe changes to objects, materials and living things, identify that certain materials and resources have different uses and describe examples of where science is used in people's daily lives. With respect to SIS, students are expected to pose and respond to questions about their experiences and predict outcomes of investigations, use informal measurements to make and compare observations, record and represent observations, and communicate ideas in a variety of ways.

The AC: S is explicit in requiring Year 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 explicitly addresses knowledge about the nature of science as well as its purpose, use in and impact on society. The AC: S elaborations are written in the form of suggestions for possible learning activities.

NZC: S addresses conceptual knowledge and understanding from the four major disciplines of science in the strands - Living World, Planet Earth and Beyond, Physical World, and Material World. Skills, attitudes and values relevant to science, as well as epistemic knowledge about science, are subsumed in the overarching and unifying strand *Nature of science*. At Levels 1 and 2, students are expected to understand science as an endeavour to gain knowledge about and explain the world through exploration, play, asking questions, and discussing simple models. The *Nature of science* strand also emphasises the importance of open-mindedness as a key value in science and aims to bring a scientific perspective to decisions and actions by linking students' science learning to their daily living. Students are

¹⁶ For further information about comparative points in this study see Section 3.2 Comparative study: Method

expected to gain an understanding of the requirements of living things, recognise their diversity, and their suitability to different habitats. They describe changes to natural features resulting from natural events and human action and share ideas about astronomical features and their physical effects on Earth. They describe simple patterns in a variety of everyday physical phenomena, compare physical and chemical properties of common materials, describe the changes materials undergo as a result of mixing, heating or cooling, and relate those characteristics to their uses.

Measurement of Curriculum: Breadth, Depth and Rigour

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

AC – Breadth

Breadth: Comprehensive

For students in Year 2, the expectations of AC: S are **comprehensive** with respect to breadth of coverage. The content descriptors address four topics in the SU strand, relating to a fundamental concept from each of the four disciplines of Biology, Chemistry, Earth and Space Science and Physics, and six Science Inquiry Skills (SIS) and two concepts relating to SHE. Each of the content descriptors in the SU and SHE strands 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. 19 Number of content descriptions in AC: S, Year 2

AC: S (Year 2) Strands	Content Descriptors	Elaborations
Science understanding	4	16
Science inquiry skills	6	12
Science as a human endeavor	2	8
Total:	12	36

NZC – Breadth

Breadth: Comprehensive

At Levels 1 and 2, the breadth of NZC: S is considered **comprehensive**. This judgement is based on the number and variety of objectives listed in The NZC (NZME, 2007a, p. 23) and takes into consideration the fact that one level in NZC: S extends over two to three years of learning. However, it should be noted that NZC: S achievement objectives are identical for Levels 1 and 2.

The achievement objectives cover several major concepts from each of the four traditional disciplines of science, denoted as *Living World, Planet Earth and Beyond, Physical World, and Material World*. NZC: S puts a particularly strong focus on learning about the *Nature of science*. This strand not only addresses epistemic knowledge and conceptual understanding about science, but also comprises objectives relating to scientific investigation and communication skills, as well as objectives that expect students to actively participate in and contribute to science related issues that are relevant to students' daily living.

AC – Depth

Depth: Fundamental

In relation to the depth of coverage of knowledge and skills specified in the curriculum, the expectations of AC: S in 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 AC: S (Year 2) are considered **fundamental**.

NZC – Depth

Depth: Fundamental

The depth of NZC: S at Levels 1 and 2 is considered **fundamental**. The achievement objectives listed in NZC: S give only broad directions regarding the knowledge and skills students are expected to learn. On their own, they provide insufficient information for giving an accurate estimate of the expected level of depth. The above judgement is supported by teacher information published on The NZC website regarding the implementation of the science capabilities at different levels of schooling (NZME, 2018n), in conjunction with the teacher support material series *Connected* (NZME, 2004-2009) and the concept overviews of the book series *Building Science Concepts* (NZME, 2001-2004). In some isolated cases the learning goals stated in these materials could be considered **challenging** for learners at Levels 1 and 2. For example, in the unit ‘How to Make a Limestone Cave’ the specific learning intentions are stated as:

The students will be able to:

- use models to explore the way in which salt and sugar dissolve and recrystallise in a reversible process;
- demonstrate and describe how the process of dissolving limestone rock is linked to the formation of caves;
- recognise that dissolved sugar recrystallises into a solid and link the associated ideas with the formation of stalactites and stalagmites from dissolved limestone. (NZME, 2007e, p. 7)

However, in most cases the depth to which students are expected to explore the scientific concepts and skills addressed in these materials is considered **fundamental**. The specific

learning intentions from the unit 'Monsters of the Deep' may be given here as a typical example to demonstrate this point:

We are learning to:

- identify some of the questions that scientists ask about the world (UaS)
- make scientific inferences about some of the colossal squid's habits (LP)
- describe how squid move (LP, Ec)
- suggest what things a colossal squid might eat (LP, Ec). (NZME, 2009d)

The abbreviations in brackets indicate the relations to NZC: S achievement objectives of the *Nature of science* sub-strands: *Understanding about science* (UaS) and *Communicating in science* (CiS), and the *Living World* sub-strands: *Life processes* (LP) and *Ecology* (Ec).

AC – Rigour

Rigour: Moderate

The terminology and expectations of AC: S indicate a **moderate** degree of rigour for Year 2 students. In AC: S, content descriptors 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 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.

NZC – Rigour

Rigour: Moderate

The rigour of NZC: S at Levels 1 and 2 is considered **moderate**. Similar to the discussion of depth above, this judgement is not based on the achievement objectives of NZC: S alone but supported by additional materials published by the NZME. The Science: Matrices of progress indicators (NZME, 2010c) give an indication of the expected student progress in science learning at different levels of schooling. These progress indicator matrices have been developed for the areas of 'Investigating in science', 'Thinking in scientific ways', 'Developing and communicating scientific understanding' and 'Developing interest and relating scientific learning to the wider world'. Based on these progress indicators, the rigour of NZC: S at Levels 1 and 2 is considered **moderate**, as may be exemplified by the progress indicators for 'Processing and Interpreting' at Levels 1 and 2:

- Level 1: With prompting, identifies observed similarities and differences to reach conclusions in simple investigations.
- Level 2: Reaches conclusions to simple investigations that are linked to their own understanding.

It must be noted that such progress indicator matrices are not available for gauging the expected rigour regarding students' conceptual understanding of the major science topics covered in the four content strands.

Comparative Analysis

The AC: S and NZC: S appear to have very similar expectations with respect to breadth, depth and rigour. Both curricula cover a similar range of science concepts, epistemic knowledge and science inquiry skills. With respect to the selection of science concepts, it is worth noting that in NZC: S the concept of evolution features as its own sub-strand within the strand *Living World* and is already introduced at Levels 1 and 2, with students being expected to “explain how we would know that some living things from the past are now extinct”. In contrast, in AC: S the notion that groups of living things (species) change over time or may become extinct is introduced in Year 10.

Other noteworthy differences between the two Science curricula are the respective emphases placed on Science inquiry skills and knowledge about the *Nature of science*. In AC: S the strands SHE and SIS appear to be equally ranked in importance with the SU strand. The AC: S gives a clear directive that all three strands are to be taught in an integrated way.

In NZC: S the *Nature of science* strand is clearly identified as the overarching and unifying strand through which “students learn what science is and how scientists work”. The stated aim is that “students learn to think and behave like scientists” (NZME, 2018o). The other strands provide contexts through which students can develop their understanding about the nature of science. Science inquiry and communication skills are presented as ‘subordinate’ to (that is, as sub-strands of) the *Nature of science* strand.

Contrary to AC: S, where judging by the number of content descriptions in each strand, science inquiry skills arguably receive the most attention, in NZC: S they are only addressed in a few broad achievement objectives in each level. However, in addition to these objectives, NZC: S defines five ‘science capabilities for citizenship’:

- Gather and interpret information
- Use evidence to support ideas
- Critique evidence
- Make meaning of scientific representations
- Engage with science. (NZME, 2018n)

These science capabilities are strongly linked to the *Nature of science* strand and address science inquiry skills in a way that puts the emphasis on how science knowledge is created and used in the world.

Year/Grade Level

Australian Curriculum: Year 6

New Zealand Curriculum: Levels 3 and 4¹⁷

Learning Area/Subject

Australian Curriculum: Science (AC: S)

New Zealand Curriculum: Science (NZC: S)

Expectations: Knowledge and Skills

In Year 6, 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, inform decisions and identify historical and cultural contributions. With respect to science inquiry skills, students are expected to follow procedures, develop investigable questions, design investigations into simple cause-and-effect relationships, identify variables to be changed and measured and describe potential safety risks when planning methods. They collect, organise and interpret their data, identifying where improvements to their methods or research could improve the data, describe and analyse relationships in data using appropriate representations, and construct multimodal texts to communicate ideas, methods and findings.

At Levels 3 and 4, the achievement objectives of NZC: S are nearly identical. Students are expected to appreciate that science is a way of explaining the world and that science knowledge changes over time. They identify ways in which scientists collaborate and provide evidence to support their ideas. Students are expected to use their science knowledge when considering issues that concern them and when making decisions about possible actions. With respect to science inquiry skills, students are expected to ask questions, find evidence, explore simple models, and carry out appropriate investigations to develop simple explanations. They begin to communicate scientific ideas and the results of investigations using appropriate scientific symbols, conventions and vocabulary. They are expected to engage with a range of science texts and begin to question the purposes for which these texts are constructed.

Students study life processes common to all living things. They explain how living things are suited to their habitats and how they respond to environmental changes, begin to classify living things according to scientific criteria, and explore how some living things in New Zealand are different from those in other places in the world and how certain groups of living things have changed over long periods of time. They are expected to develop an understanding of the nature of Earth's resources, and to investigate the water cycle and the components of the solar system. They explore, describe and represent patterns and trends for everyday examples of physical phenomena such as movement, forces, electricity and magnetism, light, sound, waves, and heat. They identify and describe sources of energy and their transformations, and the effects of contact and non-contact forces on the motion of objects. They group materials based on their observable properties, compare physical and chemical changes, and relate the observed material characteristics to technological uses and

¹⁷ For further information about comparative points in this study see Section 3.2 Comparative study: Method

natural processes. At Level 4, they also begin to develop an understanding of the particle nature of matter and use this to explain observed changes.

Measurement of Curriculum: Breadth, Depth and Rigour

	BREADTH			DEPTH			RIGOUR		
	Limited	Fundamental	Comprehensive	Limited	Fundamental	Challenging	Limited	Moderate	Challenging
AC									
NZC								Level 3	Level 4

AC – Breadth

Breadth: Comprehensive

For students in Year 6 the expectations of AC: S are regarded as **comprehensive** in relation to breadth of coverage. The content descriptions address four topics in the SU 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 the SHE strand. Each of the content descriptions in the SU and SHE strands 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.

NZC – Breadth

Breadth: Comprehensive

At Levels 3 and 4, the breadth of NZC: S is considered **comprehensive**. Students are expected to develop understanding of how science knowledge is constructed and changes over time, explore a range of concepts from all four disciplines of science, develop skills to carry out scientific investigations, use appropriate conventions and vocabulary to communicate results and scientific ideas, and engage in scientific issues using their scientific knowledge to inform their decisions about possible actions.

AC – Depth

Depth: Limited

With regard to the depth of coverage of knowledge and skills in the curriculum, the expectations of AC: S in Year 6 are deemed to be **limited**. This rating is based, in the main, on the lack of specificity about which scientific concepts are the intended focus of teaching and learning and the depth to which they are expected to be explored.

NZC – Depth

Depth: Fundamental

At Levels 3 and 4, the depth of NZC: S is considered **fundamental**. While some of the learning goals stated in the teacher resource materials published by the NZME could be considered challenging for students at Levels 3 and 4 with respect to conceptual depth, for example “describe and discuss the characteristics of viruses and bacteria” in the unit *The*

magic of Science (NZME, 2009a, p. 4), the majority of these resources indicate a fundamental depth at both levels of schooling. This judgement is also supported by the concept overviews published for the *Building Science Concepts* book series (NZME, 2001-2004), which give a rough indication of the expected depth of understanding at different levels of schooling for a large variety of concepts from all four disciplines of science.

AC – Rigour

Rigour: Moderate

The terminology and expectations of AC: S in Year 6 indicate a **moderate** degree of rigour. The elaborations of all three strands of AC: S provide numerous examples that require students to compare, classify, describe and explain aspects of phenomena. Relatively few examples provide 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 higher classification of rigour at this year level.

NZC – Rigour

Rigour: Moderate (Level 3), Challenging (Level 4)

The rigour of NZC: S is considered **moderate** at Level 3 and **challenging** at Level 4. This judgement is based on the progress indicators for student learning in science published by the NZME (2010c). For example, while students at Level 3 are still expected to rely on teacher support in evaluating their investigation methods and suggesting changes, at Level 4 they are expected to independently identify strengths and weaknesses in their investigations and make appropriate improvements. Similarly, when comparing and evaluating scientific explanations, students at Level 4 are expected to clarify or adjust their ideas after independently considering the evidence and argument, whereas students at Level 3 are expected to be able to do this only with support. A particularly indicative example for the increase in level of rigour from **moderate** at Level 3 to **challenging** at Level 4 can be found in *Science Matrix A: Developing interest and relating scientific learning to the wider world* (NZME, 2010d). In the category *Engaging in Social Issues*, students at Level 3 are expected to “use their own understanding to discuss and justify their views on social issues related to science and the environment”, whereas at Level 4 students “seek and use scientific information to debate social issues related to science and the environment” and “make a case for effective action”.

Comparative Analysis

While NZC: S Levels 3 and 4 have similar expectations with respect to breadth and depth when compared to AC: S Year 6, the expected rigour of NZC: S Level 4 as judged by the NZME progress indicators clearly exceeds that of AC: S at Year 6. It should be noted that at this year level NZC: S only expects students to begin working at Level 4 (NZME, 2007d). The high rigour expected in NZC: S Level 4 is corroborated by the National Monitoring Study of Student Achievement (NMSSA), which annually assesses a representative sample of New Zealand students in selected learning areas at Years 4 and 8 (AC Years 3 and 7). The study found that in 2012 only 19 per cent of Year 8 students were achieving at or above level 4 (EARU and NZCER, 2012), and in 2017 only 20 per cent (EARU and NZCER, 2017). These are the lowest percentages of level 4 achievement compared to all other learning areas tested between 2012 and 2015 (Darr, 2017).

The differences between AC: S and NZC: S regarding the status of the *Nature of science* strand and the role of the science capabilities as a framework for science inquiry skills has

already been discussed at the AC Year 2 comparison point and applies equally at this point. It is worth restating the fact that contrary to AC: S, NZC: S addresses the concept of evolution already in the primary years. NZC: S students at Levels 3 and 4 are expected to explore the changes that groups of living things have undergone over long periods of time and to appreciate that some living things in New Zealand are quite different from living things in other areas of the world.

Year/Grade Level

Australian Curriculum: Year 10

New Zealand Curriculum: Levels 5 and 6¹⁸

Learning Area/Subject

Australian Curriculum: Science (AC: S)

New Zealand Curriculum: Science (NZC: S)

Expectations: Knowledge and Skills

At the end of Year 10, AC: S expects students to have gained an understanding of the structure and function of cells and multi-cellular organisms, the interdependencies of species in ecosystems, and the role of genes and DNA in the processes that underpin heredity and evolution. Students are expected to understand the structure of the atom and how properties of substances, as well as physical and chemical changes, can be explained through the particulate nature of matter. They are expected to describe and predict the motion of objects as a consequence of forces acting on them, explain energy conservation and represent energy transfer and transformation within systems. They should have gained an understanding of different types of rocks and be able to explain the theory of plate tectonics, describe and analyse interactions and cycles within and between Earth's spheres, and evaluate the evidence for scientific theories that explain the origin of the universe and the diversity of life on Earth. They are expected to analyse how the models and theories they use have developed over time and discuss the factors that prompted their review. Students are also expected to:

- develop questions and hypotheses and independently design and conduct scientific 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.

At Levels 5 and 6 in NZC: S, the achievement objectives for the *Nature of science* strand are identical. Students are expected to understand that scientists' investigations are informed by current scientific theories and that the collected evidence is interpreted and evaluated through

¹⁸ For further information about comparative points in this study see Section 3.2 Comparative study: Method

logical argument. They are expected to gather scientific information about socio-scientific issues in order to draw evidence-based conclusions and to take action where appropriate. Students carry out more complex investigations, including models and multiple variables and begin to evaluate the suitability of the methods chosen. They are expected to engage with popular, as well as scientific texts, and communicate scientific ideas using a wider range of science vocabulary, symbols and conventions.

The NZC: S achievement objectives of the content strands differ significantly between Levels 5 and 6. In the strand *Living World*, students at Level 5 are expected to describe the organisation of life at the cellular level and identify key structural features and functions involved in life processes, investigate the interdependence of living things in ecosystems, and describe the basic process that underlie heredity. At Level 6 the same topics from the fields of cellular processes, ecology and evolution are explored in more detail and at greater depth.

Similarly, in the strand *Planet Earth and beyond*, Level 5 lays the foundation of students' understanding of the structure, composition and features of Earth's systems and its interactions, whereas at Level 6 students are expected to develop a deeper understanding of how those spheres interact with each other, how elements like carbon cycle through them, and how they shape and change the surface features of New Zealand.

In the strand *Physical World*, students at Level 5 are expected to identify and describe the patterns associated with physical phenomena found in simple everyday situations, whereas at Level 6 they are also expected to demonstrate an understanding of those phenomena by explaining their underlying concepts and by solving related questions and problems. In the strand *Material World*, students at Level 5 are expected to investigate the basic chemical and physical properties of matter, distinguish between pure substances and mixtures, and elements and compounds, and describe the basic structure of atoms. At Level 6, students identify pattern and trends in the properties of a range of substances, link those patterns to the organisation of the periodic table of elements, explore the factors that affect chemical changes and explain those in terms of particle theory, and distinguish between different models of bonding between atoms. At both levels, students are also expected to explore how the knowledge of biological, physical and chemical phenomena is applied in society.

Measurement of Curriculum: Breadth, Depth and Rigour

	BREADTH			DEPTH			RIGOUR		
	Limited	Fundamental	Comprehensive	Limited	Fundamental	Challenging	Limited	Moderate	Challenging
AC									
NZC								Level 5	Level 6

AC – Breadth

Breadth: Comprehensive

For students in Year 10, the expectations of AC: S are regarded as **comprehensive** in relation to breadth of coverage. The content descriptors address eight topics in the SU 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 the SHE strand. Each of the content descriptors in the SU and SHE strands 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**.

NZC – Breadth

Breadth: Comprehensive

At both Levels 5 and 6, the breadth of NZC: S is considered **comprehensive**. The range of concepts and topics students are expected to study within the four content strands is designed to give students a comprehensive scientific understanding of the most important phenomena that govern the natural world as well as the technological world. In addition, the concepts and skills addressed in the *Nature of science* strand equip students not only with the skills required to conduct scientific investigations, but also with an understanding of the purpose of science as a human endeavour.

AC – Depth

Depth: Challenging

The expectations of AC: S in Year 10 are **challenging** with respect to the depth of coverage of knowledge and skills encountered in the curriculum. Notwithstanding the non-mandatory nature of the elaborations, which are the primary source of information for gauging the expected depth and rigour of the curriculum, the concepts addressed in these elaborations and the wealth of scientific terminology used in the wording of the suggested learning activities clearly demonstrate sophisticated and in-depth study.

NZC – Depth

Depth: Challenging

At Levels 5 and 6, the depth of NZC: S is considered **challenging**. The achievement objectives for both levels as stated in NZC: S are broad, overarching statements that lack the necessary detail to accurately gauge the depth to which scientific concepts are expected to be explored. The judgement is based on the series of teacher resource materials *Applications* published by the NZME (2004-2007) and aimed at students in Years 9-11 (AC Years 8-10). The suggested student activities in this series clearly indicate a challenging expectation of depth already at Level 5. For example, in the teacher notes entitled *Discovering our ancestors* (NZME, 2004), students at Level 5 are expected to explore a variety of topics that require a considerable understanding of complex scientific concepts and technologies, such as radio-carbon dating, DNA analysis, and tectonic processes. Two examples from this publication targeting achievement objectives for the strands *Living World* and *Planet Earth and Beyond* are quoted here to illustrate these challenging expectations:

- Research the procedure of gel electrophoresis and, if possible, investigate some authentic data produced by it.
- Research the rock cycle and, with reference to local and Pacific sites, describe the processes during which artefacts and organic remains may be deposited (sedimentation) or exposed

(uplift and erosion). (NZME, 2004, p. 5)

AC – Rigour

Rigour: Moderate

The expectations of AC: S at the end of Year 10, as gauged by the content elaborations and achievement standards, indicate a **moderate** degree of rigour. The elaborations of all three strands of 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. Less evidence is available of quantitative analysis and mathematical application of scientific concepts, justifying a rating of a moderate level of rigour.

NZC – Rigour

Rigour: Moderate (Level 5), Challenging (Level 6)

The rigour of NZC: S is considered **moderate** at Level 5 and **challenging** at Level 6. Judgement of Level 5 is based on the progress indicators for student learning in Science (NZME, 2010c). These indicators overall suggest a moderate level of rigour with respect to expectations of student progress in the areas of *Developing interest and relating scientific learning to the wider world*, *Investigating in science*, *Thinking in scientific ways*, and *Developing and communicating scientific understanding*. As an example, students at Level 5 in *Developing and communicating scientific understanding* are expected to “begin using quantitative relationships as part of explanations” (NZME, 2010e).

At Level 6, the expectations with respect to rigour are significantly higher, as judged by the Level 1 Science assessment resources for the NCEA (NZME, 2018p) and the resources for internally and externally assessed standards in Science for Level 1 published by NZQA (2018). These resources, which all relate to the (general) Science course, indicate a challenging level of rigour with respect to expectations of student achievement. For example, in the Internal Assessment Resource for Achievement Standard ‘Investigate implications of electricity and magnetism for everyday life’ (NZME, 2015e), the Teacher Guidelines state that “before they begin the task, students need to know... that adding resistance in parallel lowers the total resistance of the circuit, which increases the current and heat for a given voltage (total resistance is not the sum of each resistance in a parallel circuit, rather, $1/R_{\text{tot}} = 1/R_1 + 1/R_2 + \dots + 1/R_n$ for n resistors in parallel)” (NZME, 2015e, p. 2).

The assessment resources for the (optional) disciplinary subjects Agricultural and horticultural science, Biology, Chemistry, Physics and Earth and space science tend to be more challenging still, especially with respect to the expected rigour in students' quantitative exploration of scientific concepts.

Comparative Analysis

Contrary to AC: S, where only the final two years of schooling are referred to as senior secondary and allow students to specialise in specific science disciplines, in NZC: S Year 11 (AC Year 10) students may choose between the subjects of Agricultural and horticultural science, Biology, Chemistry, Physics, Earth and space science, and (general) Science. Schools in New Zealand have the freedom to implement the national curriculum in ways that best address the needs, interests and circumstances of their students, including the design of

a variety of science learning programs. However, all programs are required to implement the broadly defined achievement objectives of NZC: S for Levels 5 to 8 and are required to develop the key competencies at the same time.

A notable difference to AC: S is the explicit requirement of the senior secondary NZC: S to focus on *Nature of science* as the overarching, unifying strand in the science curriculum. This strand, which comprises the sub-strands *Understanding about science*, *Investigating in science*, *Communicating in science*, and *Participating and contributing in science*, is meant to provide the contexts through which the *Nature of science* is explored in all individually designed science learning programs. As stated on The NZC website “While content knowledge continues to be important, the emphasis of the curriculum is on science as a process” (NZME, 2010f).

The expectations of NZC: S Year 11 at both Levels 5 and 6 are comparable to those of AC: S Year 10 with respect to breadth and depth. In the case of rigour, the expectations of NZS: S Level 5 are considered comparable to the rigour of AC: S at Year 10. Judging by the assessment resources published by the MoE for Level 6 (referred to as Level 1 for the senior secondary years), the expectations of NZC: S with respect to rigour appear to be higher than those of AC: S at Year 10. At this level, New Zealand students of both general and special Science courses are expected to explore the quantitative aspects of scientific concepts more rigorously than Australian students at the same year level.

d) Learning area: Humanities and Social Sciences

Comparative Curricula

Australian Curriculum
New Zealand Curriculum

Version 8.3, 2016
2007

Year/Grade Level

Australian Curriculum: Year 2
New Zealand Curriculum: Levels 1 and 2¹⁹

Learning Area/Subject

Australian Curriculum: Humanities and Social Sciences (AC: HASS)
New Zealand Curriculum: Social Sciences (NZC: SS)

This section is a comparative study of the AC: Humanities and Social Sciences and The NZC: Social Sciences. All references in this section are sourced from the curriculum documents AC: F-10: Humanities and Social Sciences (ACARA, 2018d), The NZC: Social Sciences (NZME, 2014g) and The NZC: Achievement objectives by learning area (2007d), unless otherwise stated.

Expectations: Knowledge and Skills

The expectations of 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 explore near and distant places with which they are familiar, and 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 NZC: SS, at all levels, is organised using four conceptual strands:

- identity, culture and organisation
- place and environment
- continuity and change
- the economic world.

Within these strands students “learn about people, places, cultures, histories, and the economic world, within and beyond New Zealand” and “clarify their own identities in relation to their particular heritages and contexts” (NZME, 2007a, p.30). The NZC: SS for Level 1 Social Studies does not specify topics or content. Rather, students work towards the following achievement objectives:

- understand how belonging to groups is important to people
- understand that people have different roles and responsibilities as part of their participation in groups

¹⁹ For further information about comparative points in this study see Section 3.2 Comparative study: Method

- understand how the past is important to people
- understand how places in New Zealand are significant for individuals and groups
- understand how the cultures of people in New Zealand are expressed in their daily lives.

The NZC: SS for Level 2 Social Studies also does not specify topics or content, with students working towards the following achievement objectives:

- understand that people have social, cultural and economic roles, rights and responsibilities
- understand how people make choices to meet their needs and wants
- understand how cultural practices reflect and express people’s customs, traditions and values
- understand how time and change affect people’s lives
- understand how places influence people and people influence places
- understand how people make significant contributions to New Zealand society
- understand how the status of Māori as tangata whenua is significant for communities in New Zealand. (NZME, 2014g)

Content, topics and sequencing at both levels are determined by individual teachers, schools and systems.

Measurement of Curriculum: Breadth, Depth and Rigour

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

AC – Breadth

Breadth: Comprehensive

For students in Year 2, the expectations of AC: HASS are regarded as **comprehensive** in relation to breadth of coverage. The concepts and skills of AC: HASS allow learners to build on 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 its designated 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, each with one or more elaborations. The content descriptors are mapped against the associated cross-curriculum priorities and general capabilities.

Table 3. 20 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

NZC – Breadth

Breadth: Comprehensive

For students at Level 1 and Level 2, the expectations of NZC: SS for Social Studies are regarded as **comprehensive** in relation to breadth of coverage. The achievement objectives for Level 1 lay the foundation for student understanding of community and perspectives beyond their own within a New Zealand context. Specific content and learning intentions are implied through concepts such as ‘belonging’, ‘roles’, ‘responsibilities’, ‘past’, ‘places’ and ‘cultures’. The achievement objectives for Level 2 build on the skills, experiences and knowledge of Level 1 by again using concepts such as ‘roles’, ‘rights’ and ‘responsibilities’ and adding concepts such as ‘choices’, ‘customs’, ‘values’, ‘time’ and ‘change’.

AC – Depth

Depth: Fundamental

Based on the details of knowledge and topics specified in the AC, the expectations of AC: HASS for Year 2 are considered to be **fundamental**. In Year 2, the content descriptions of 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, each with its 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 on age and stage appropriate observations, interpretations and communication.

NZC – Depth

Depth: Fundamental

Based on the details of knowledge and topics specified in The NZC, the expectations of NZC: SS at Level 1 and Level 2 for Social Studies are considered to be **fundamental**. For Level 1, the achievement objectives of NZC: SS are limited to five statements associated with knowledge, skills and experiences. For Level 2, there are seven statements. The depth and detail required to achieve each objective is not specified for either level, but is implied through the relationships and judgements contained in each statement, such as “how the past is important to people” and “how places influence people and people influence places” or for students (and teachers) to make assessments of ‘significance’ of places.

AC – Rigour

Rigour: Moderate

The cognitive demand placed on Year 2 students in 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 predominantly 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 following terms: ‘identify’, ‘describe’, ‘sequence’ – with limited use of ‘analyse’, ‘interpret’ and ‘reflect’.

NZC – Rigour

Rigour: Moderate

The cognitive demand placed on students in NZC: SS at Level 1 and Level 2 for Social Studies indicates a **moderate** degree of rigour. The directive terms and expectations at both levels are predominantly associated with the cognitive process of ‘understand how’. The higher-order cognitive processes of ‘analyse’, ‘reflect’ and ‘evaluate’ stated in the ‘social inquiry approach’ (NZME, 2007a, p. 30) are not replicated in the Level 1 or the Level 2 achievement objectives for NZC: SS.

Comparative Analysis

Both AC: HASS and NZC: 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 in some way on the expanding communities model to shape the context, scope and developmental sequence to be followed during Year 2 or at Level 1/Level 2.

In AC: HASS in Year 2 there is clear and systematic alignment between the aims and intentions, the content descriptions (inquiry skills, knowledge and understanding), and the achievement standard. With respect to instruction time in AC: HASS, the possible amount of time allocated to the delivery of each subject area is indicated in the notional advice given to the curriculum writers:

Year 2 – 4% of time (2% History, 2% Geography) (ACARA, 2013, p. 9).

The NZC: SS for Social Studies is a concept-based, inquiry-driven curriculum. It is designed to allow teachers and students to pursue directions of particular interest and local relevance. The resultant depth, breadth and rigour of student learning is, therefore, closely linked to the quality of the programming and learning experiences in each individual classroom. It should also be noted that the NZME does not allocate or mandate the amount of time devoted to any part of NZC: SS at either Level 1 or Level 2.

Year/Grade Level

Australian Curriculum: Year 6

New Zealand Curriculum: Levels 3 and 4²⁰

Learning Area/Subject

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

New Zealand Curriculum: Social Sciences (NZC: SS)

Expectations: Knowledge and Skills

The expectations of 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, 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 NZC: SS, at all levels, is organised using four conceptual strands:

- identity, culture and organisation
- place and environment
- continuity and change
- the economic world.

Within these strands students “learn about people, places, cultures, histories, and the economic world, within and beyond New Zealand” and “clarify their own identities in relation to their particular heritages and contexts” (NZME, 2007a, p.30). The NZC: SS for Level 3 Social Studies does not specify topics or content. Rather, students work towards the following achievement objectives:

²⁰ For further information about comparative points in this study see Section 3.2 Comparative study: Method

- understand how groups make and implement rules and laws
- understand how cultural practices vary but reflect similar purposes
- understand how people view and use places differently
- understand how people make decisions about access to and use of resources
- understand how people remember and record the past in different ways
- understand how early Polynesian and British migrations to New Zealand have continuing significance for tangata whenua and communities
- understand how the movement of people affects cultural diversity and interaction in New Zealand.

The NZC: SS for Level 4 Social Studies also does not specify topics or content, with students working towards the following achievement objectives:

- understand how the ways in which leadership of groups is acquired and exercised have consequences for communities and societies
- understand how people pass on and sustain culture and heritage for different reasons and that this has consequences for people
- understand how exploration and innovation create opportunities and challenges for people, places and environments
- understand that events have causes and effects
- understand how producers and consumers exercise their rights and meet their responsibilities
- understand how formal and informal groups make decisions that impact on communities
- understand how people participate individually and collectively in response to community challenges.

Content, topics and sequencing at both levels are determined by individual teachers, schools and systems.

Measurement of Curriculum: Breadth, Depth and Rigour

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

AC – Breadth

Breadth: Comprehensive

For students in Year 6, the expectations of AC: HASS are **comprehensive** in relation to breadth of coverage. The concepts and skills of AC: HASS (Year 6) allow learners to build on experiences from the curriculum in Year 3, Year 4 and Year 5 as they continue to explore their personal past and present, an approach that aligns with Hanna’s ‘expanding communities’ model for social science education (Stallones, 2003). In Years 5 and 6, AC: HASS expands to include four sub-strands (History, Geography, Civics and Citizenship, Economics and Business), presenting concepts and additional inquiry questions within the overview statements for each sub-strand. Each knowledge and understanding content description contains multiple elaborations. The inquiry and skill categories apply across all four sub-strands and each has one or more elements, with one or more elaborations.

Table 3. 21 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

NZC – Breadth

Breadth: Comprehensive

For students at Level 3 and Level 4, the expectations of NZC: SS for Social Studies are **comprehensive** in relation to breadth of coverage. The conceptual content builds on the personal view of the world targeted at Level 1 and Level 2, and is in line with Hanna’s ‘expanding communities’ model (Stallones, 2003) for social science education and is age-appropriate. Again, specific content and learning intentions are implied through concepts such as ‘cultural practices’, ‘decisions about resources’, ‘remember and record the past’, ‘cultural diversity and interaction’, ‘places’ and ‘cultures’. The achievement objectives for Level 4 build on the skills, experiences and knowledge of Level 3 by again using concepts such as ‘leadership’, ‘heritage’ and ‘consequences’ and adding concepts such as ‘innovation’, ‘impact’ and ‘community challenges’.

AC – Depth

Depth: Fundamental

The expectations of AC: HASS for Year 6 are regarded as **fundamental**. In Year 6, the content descriptions of AC: HASS expands 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 on the collection and recall of information and presentation of narratives and explanations.

NZC – Depth

Depth: Fundamental

Based on the details of knowledge and topics specified in The NZC, the expectations of NZC: SS for Social Studies at Level 3 and Level 4 are considered to be **fundamental**. For Level 3, the achievement objectives of NZC: SS are limited to seven statements associated with knowledge, skills and experiences. For Level 4, there are also seven statements. The depth and detail required to achieve each objective is not specified for either level, but is implied through the relationships and judgements contained in each statement, such as ‘how people remember and record the past in different ways’ and ‘how exploration and innovation create opportunities and challenges for people, places and environments’ or for students (and teachers) to make assessments of the ‘impact’ of decisions on communities.

AC – Rigour

Rigour: Moderate

The cognitive demand placed on Year 6 students in AC: HASS indicates a **moderate** degree of rigour. The directive terms and expectations of students found 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 following terms: ‘identify’, ‘explain’, ‘describe’, ‘compare’, ‘locate’ – with some use of ‘analyse’, ‘interpret’, ‘reflect’ and ‘take action’.

NZC – Rigour

Rigour: Moderate

The cognitive demand placed on students in NZC: SS for Social Studies at Level 3 and Level 4 indicates a **moderate** degree of rigour. The directive terms and expectations at both levels are predominantly associated with the cognitive process of ‘understand how’. The higher-order cognitive processes of ‘analyse’, ‘reflect’ and ‘evaluate’ stated in the ‘social inquiry approach’ (NZME, 2007a, p.30) are not replicated in the Level 3 or the Level 4 achievement objectives for NZC: SS.

Comparative Analysis

Both the AC: HASS and NZC: 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 in some way on the expanding communities model to shape the context, scope and developmental sequence to be followed during Year 6 or at Level 3/Level 4. Each curriculum explores notions of time, place and space, causal relationships and varying points of view.

In AC: HASS in Year 6 there is clear and systematic alignment between the aims and intentions, the content descriptions (inquiry skills, knowledge and understanding), and the achievement standard. With respect to instruction time in AC: HASS, the possible amount of time allocated to the delivery of each subject area is indicated in the notional advice given to the curriculum writers:

Year 6 – 12% of time (4% History, 4% Geography, 2% Civics and Citizenship, 2% Economics and Business) (ACARA, 2013, p. 9).

The NZC: SS for Social Studies is a concept-based, inquiry-driven curriculum. It is designed to allow teachers and students to pursue directions of particular interest and local relevance. The resultant depth, breadth and rigour of student learning is, therefore, closely linked to the quality of the programming and learning experiences in each individual classroom. It should also be noted that the NZME does not allocate or mandate the amount of time devoted to any part of NZC: SS at either Level 3 or Level 4.

Year/Grade Level

Australian Curriculum: Year 10

New Zealand Curriculum: Levels 5 and 6²¹

Learning Area/Subject

Australian Curriculum: History (AC: H)

Geography (AC: G)

Civics and Citizenship (AC: CC)

Economics and Business (AC: EB)

New Zealand Curriculum: Social Sciences (NZC: SS)

Expectations: Knowledge and Skills

The AC: HASS diverges in Year 7 to form four discrete subject areas for Year 7 through to Year 10. Students are able to study 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, AC: H offers a focus on the history of the modern world and Australia from 1918 to the present, with an emphasis on Australia's global context. The content is organised into two strands: inquiry and skills, 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?

For Year 10 students, 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, 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.

²¹ For further information about comparative points in this study see Section 3.2 Comparative study: Method

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, 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 in Year 10 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?

The AC: EB at Year 10 level offers 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 NZC: SS, at all levels, is organised using four conceptual strands:

- identity, culture and organisation
- place and environment
- continuity and change
- the economic world.

Within these strands students learn about people, places, cultures, histories and the economic world, within and beyond New Zealand and clarify their own identities in relation to their particular heritages and contexts (NZME, 2007a, p.30). The NZC: SS for Level 5 does not specify topics or content. Rather, students work towards the following achievement objectives:

- understand how systems of government in New Zealand operate and affect people's lives, and how they compare with another system
- understand how the Treaty of Waitangi is responded to differently by people in different times and places
- understand how cultural interaction impacts on cultures and societies
- understand that people move between places and how this has consequences for people and places
- understand how economic decisions impact on people, communities and nations

- understand how people’s management of resources impacts on environmental and social sustainability
- understand how the ideas and actions of people in the past have had a significant impact on people’s lives
- understand how people seek and have sought economic growth through business, enterprise, and innovation
- understand how people define and seek human rights.

At Level 6, NZC: SS divides into four discreet disciplines: Social Sciences, History, Geography and Economics. Each discipline has its own achievement objectives.

For Social Sciences the achievement objectives are:

- understand how individuals, groups and institutions work to promote social justice and human rights
- understand how cultures adapt and change and that this has consequences for society.

For History the achievement objectives are:

- understand how the causes and consequences of past events that are of significance to New Zealanders shape the lives of people and society
- understand how people’s perspectives on past events that are of significance to New Zealanders differ.

For Geography the achievement objectives are:

- understand that natural and cultural environments have particular characteristics and how environments are shaped by processes that create spatial patterns
- understand how people interact with natural and cultural environments and that this interaction has consequences.

For Economics the achievement objectives are:

- understand how, as a result of scarcity, consumers, producers and government make choices that affect New Zealand society
- understand how the different sectors of the New Zealand economy are interdependent.

Content, topics and sequencing is determined by individual teachers, schools and systems.

Measurement of Curriculum: Breadth, Depth and Rigour

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

AC – Breadth

Breadth: Comprehensive

Year 10 students encounter high expectations through the combined agency of four subject areas; these are deemed to be **comprehensive** in relation to breadth of coverage. The

concepts and skills of AC: H, AC: G, AC: CC, and AC: EB in Year 10 allow learners to build on experiences from each of these specific subject areas in Year 7, Year 8 and Year 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. 22 Number of content descriptions in AC: H, AC: G, AC: CC & AC: EB, Year 10

Year 10	AC: H 10	AC: G 10	AC: CC 10	AC: EB 10
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

NZC – Breadth

Breadth: Comprehensive

For students at Level 5 and Level 6, the expectations of NZC: SS are **comprehensive** in relation to breadth of coverage. The conceptual content builds on the personal view of the world targeted at Level 3 and Level 4, and is in line with Hanna’s ‘expanding communities’ model (Stallones, 2003) for social science education and is age-appropriate. At Level 6 there is delineation between four disciplines within the social sciences, with broad differing conceptual targets established for Social Studies, History, Geography and Economics. The achievement objectives for Level 5 build on the skills, experiences and knowledge of earlier levels through concepts such as ‘cultural interaction’, ‘decisions’, ‘impact’, ‘sustainability’ and ‘human rights’. For Level 6 the discipline-specific achievement objectives incorporate the exploration of concepts such as ‘cultural adaptation and change’, ‘perspectives’, ‘choice’ and ‘consequences’.

AC – Depth

Depth: Fundamental

The expectations of AC: HASS for Year 10 are **fundamental**, based on the details of knowledge and topics outlined in the curriculum. In Year 10, 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, 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. Considered alone, each subject area has the potential to be challenging in its depth. Taken collectively, the coverage and mastery of the multiple components of the four subject areas

could be challenged by time constraints. The content descriptions primarily focus on descriptions, explanations, interpretations and communication.

NZC – Depth

Depth: Fundamental

Based on the details of knowledge and topics specified in The NZC, the expectations of NZC: SS at Level 5 and Level 6 are considered to be **fundamental**. For Level 5, the achievement objectives of NZC: SS are limited to nine statements associated with knowledge, skills and experiences. For Level 6 the achievement objectives for each discipline are limited to two statements. The depth and detail required to achieve each objective is not specified for either level, but is implied through the relationships and judgements contained in each statement, such as “how the Treaty of Waitangi is responded to differently by different people in different times and places” and “how people seek and have sought economic growth through business, enterprise, and innovation” or for students (and teachers) to make assessments of the ‘significance’ and ‘consequence’ of decisions on communities.

AC – Rigour

Rigour: Challenging

The cognitive demand placed on Year 10 students in each of the four subject areas that comprise 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 following terms: ‘analyse’, ‘evaluate’, ‘apply’ and ‘take action’.

NZC – Rigour

Rigour: Moderate

The cognitive demand placed on students in NZC: SS at Level 5 and Level 6 indicates a **moderate** degree of rigour. The directive terms and expectations at both levels are predominantly associated with the cognitive process of ‘understand how’. The higher-order cognitive processes of ‘analyse’, ‘reflect’ and ‘evaluate’ stated in the ‘social inquiry approach’ (NZME, 2007a, p. 30) are not replicated in the Level 5 or the Level 6 achievement objectives for NZC: SS.

Comparative Analysis

Both the AC: HASS and NZC: 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 in some way on the expanding communities model to shape the context, scope and developmental sequence to be followed during Year 10 or at Level 5/Level 6. Each curriculum explores notions of time, place and space, causal relationships and varying points of view.

The AC: HASS in Years 7-10 replaces the four integrated sub-strands with four separate subject areas: History, Geography, Civics and Citizenship, and Economics and Business. In AC: HASS in Year 10, the targeted inquiry skills are organised developmentally or

hierarchically according to the subject-specific aims and associated achievement standards. With respect to instruction time in AC: HASS, the possible amount of time allocated to the delivery of each subject area is indicated in the notional advice given to the curriculum writers:

Year 10 – 17% of time (5% History, 5% Geography, 2% Civics and Citizenship, 5% Economics and Business) (ACARA, 2013, p. 9).

The NZC: SS is a concept-based, inquiry-driven curriculum. At Level 6 it divides into four discrete disciplines: Social Studies, History, Geography and Economics to allow for student specialization in the final years of schooling. In both Level 5 and Level 6 NZC: SS is designed to allow teachers and students to pursue directions of particular interest and local relevance. The resultant depth, breadth and rigour of student learning is, therefore, closely linked to the quality of the programming and learning experiences in each individual classroom. It should also be noted that the NZME does not allocate or mandate the amount of time devoted to any part of NZC: SS at Level 5 or Level 6.

The following overall conclusions can be drawn from this comparative analysis of AC: HASS and NZC: SS:

- both curricula provide frameworks for teaching and learning that are developmentally and culturally appropriate
- the breadth of 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 on the depth with which the curriculum is implemented in schools
- the breadth of NZC: SS also expands over time, with the inclusion of an increased range of concept-based achievement objectives, while at Level 6 four discrete subject areas appear to allow for more targeted and in-depth learning in the final levels of schooling
- AC: HASS provides details of student performance expectations via the achievement standards for each sub-strand and subject
- NZC: SS provides no guidance on or details about student performance expectations
- AC: HASS provides for continuous developmental acquisition of the skills and knowledge associated with all four strands of the Humanities from Foundation to Year 10
- NZC: SS is structured as a sequence of levels associated with the acquisition of conceptual understanding within a philosophical and pedagogical framework of inquiry-based learning
- AC: HASS and NZC: SS rely on the programming and classroom practices of individual teachers, schools or districts to fulfil their potential for student engagement and rigour in learning, with AC: HASS, at the time of this comparison, providing greater specific support and guidance in these areas.

e) Learning area: The Arts

Comparative Curricula

Australian Curriculum
New Zealand Curriculum

Version 8.3, 2016
2007

Year/Grade Level

Australian Curriculum: F-Year 2
New Zealand Curriculum: Level 1²²

Learning Area/Subject

Australian Curriculum: The Arts (AC: TA)
New Zealand Curriculum: The Arts (NZC: TA)

This section is a comparative study of the AC: The Arts and The NZC: The Arts. All references in this section are sourced from the curriculum documents AC: F-10: The Arts (ACARA, 2018e), The NZC: The Arts (NZME, 2014h) and The NZC: Achievement objectives by learning area (2007d), unless otherwise stated.

Expectations: Knowledge and Skills

The AC: TA and NZC: TA both:

- include a learning area overview and curriculum content for discrete Arts disciplines/subjects. AC: TA includes 5 subjects - Dance, Drama, Media Arts, Music and Visual Arts. NZC: TA includes Dance, Drama, Music-Sound Arts and Visual Arts.
- structure content around four central sub-strands (AC: TA); or strands (NZC: TA). These strands/sub-strands relate to context, practice, presentation/performance/display and response (critique) of their own and others' work
- use a spiral design, that is, each band/level builds on and revisits key concepts and practices providing opportunities for 'progressions of learning' (NZME, 2014k).

In AC: TA the interdependent Arts strands of *making* and *responding* underpin the curriculum for each of the five Arts subjects. A focus on *purposeful and creative play in structured activities* and on the Arts in their lives and communities is a feature of the curriculum in the F-2 band. This creates strong links with the learning outcomes in the Early Years Learning Framework such as "Children have a strong sense of identity" and "Children are effective communicators" (AGDET, 2018b). Fundamental knowledge, skills and processes are clearly identified and described for each Arts subject providing starting points for learning.

Level 1 of NZC: TA outlines the curriculum for students in their first years of schooling. As with AC: TA, at this level, there is a focus on developing students' awareness of the Arts in their lives and communities. In Drama and Music elements that are a focus for Level 1 such as role and melody are identified by name, in and thereafter referred to as 'elements'. Additional elements are introduced by name in subsequent levels, for example, 'structural devices' is added for Music at Level 2.

²² For further information about comparative points in this study see Section 3.2 Comparative study: Method

Measurement of Curriculum: Breadth, Depth and Rigour

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

AC – Breadth

Breadth: Comprehensive

For Year F-2 students AC: TA outlines learning that is designed to engage students with all five Arts subjects. The curriculum for each subject includes four content descriptions, one for each of the four sub-strands: *exploring ideas and improvising ways of representing ideas, developing understanding of discipline-specific practice, sharing artworks through performance, presentation or display, and responding to and interpreting artworks*. Each subject offers an authentic, discipline-specific Arts experience that reflects the knowledge and ways of learning in that field. For example, in Music, students develop aural skills by exploring and imitating sounds, pitch and rhythm patterns using voice, movement and body percussion whereas in Visual Arts they “explore ideas, experiences, observations and imagination to create visual artworks and design, including considering ideas in artworks by Aboriginal and Torres Strait Islander artists”. This represents **comprehensive** coverage across specific content descriptions that reflect the language and practice of each Arts subject.

Table 3. 23 AC: TA, F-6 – Structure

Year 2	Australian Curriculum: The Arts				
Subjects (Disciplines)	AC: Dance	AC: Drama	AC: Media Arts	AC: Music	AC: Visual Arts
Strands (making & responding)	2 (NB -these strands are inter-dependent and present in each sub-strand. The strands are not explicitly identified in the content descriptions and achievement standards)				
Sub-strands	Exploring ideas and improvising ways of representing ideas Developing understanding of discipline-specific practices Sharing artworks through performance, presentation or display Responding to and interpreting artworks				
	AC: Dance	AC: Drama	AC: Media Arts	AC: Music	AC: Visual Arts
Content descriptions	4	4	4	4	4
Elaborations (not mandated)	22	19	21	22	18

NZC – Breadth

Breadth: Comprehensive

At Level 1 NZC: TA introduces students to the ways of knowing and doing that underpin learning in each of Dance, Drama, Music-Sound Arts and Visual Arts. As with AC: TA the curriculum for each subject offers an authentic, discipline-specific Arts experience that reflects the knowledge and learning in that field. The curriculum for each subject includes an achievement objective for each of 'Understanding in Context', 'Developing Practical Knowledge', 'Developing Ideas' and 'Communicating and Interpreting'. At each level, elements or central organising ideas are introduced for each subject. For example, in Music-Sound Arts, students develop practical knowledge about beat, rhythm, pitch, tempo, dynamics, and tone colour with 'structural devices' (NZME, 2014) added at Level 2 whereas in Visual Arts students learn about materials and tools and discover elements and selected principles in Levels 1 and 2 (op. cit.) Additional achievement objectives relating to recording ideas (notation) and responding to live and recorded music (listening responses) are also included in the Music-Sound Arts curriculum. This represents **comprehensive** coverage stretching across highly specific content descriptions, that reflect the language and practice of each Arts subject.

Table 3. 24 NZC: TA – Structure, Levels 1 and 2

Year 2		New Zealand Curriculum: The Arts			
Strands (Disciplines)		Dance	Drama	Music-Sound Arts	Visual Arts
Sub-strands		Understanding the Arts in Context Developing Practical Knowledge Developing Ideas Communicating and Interpreting			
Achievement Objectives	Level 1	4	4	6	4
	Level 2	4	4	6	4
Elaborations		N/A	N/A	N/A	N/A

AC – Depth

Depth: Challenging

For Year 2 students, AC: TA is regarded as **challenging** as it encompasses a set of five discrete subjects, each with its own content descriptions knowledge and skills. The content introduces subject-specific, authentic arts practices relevant to the real world. An example is the requirement to “explore role and dramatic action in dramatic play, improvisation and process drama”. A focus at this stage of learning is on learning about the role of the arts across communities, for example in Dance, students consider “where and why people dance”. The AC: TA also challenges Year 2 students by delivering a curriculum that is characterised by learning that integrates, interconnects and offers a composite of knowledge requiring higher-order thinking. For example, in each of The Arts subjects, students explore the arts and learn how artworks can represent the world and that they can make artworks to represent their ideas about the world (AC: TA, F-2 Band description).

NZC – Depth

Depth: Challenging

At Level 1, NZC: TA outlines a **challenging** curriculum as it encompasses four discrete subjects, each with achievement objectives that refer to specific knowledge and skills. For example, in Drama students explore the elements of role, focus, action, tension, time and space through dramatic play. The place and purpose of each of The Arts subjects in students' lives and their communities are also a focus. For example, in Drama, students are required to “demonstrate an awareness that drama serves a variety of purposes in their lives and in their communities”. Higher order thinking is required to meet achievement objectives such as “Explore and express sounds and musical ideas, drawing on personal experience, listening and imagination” in Music-Sound Arts and “investigate visual ideas in response to a variety of motivations, observation and imagination” in Visual Arts.

AC – Rigour

Rigour: Challenging

The **challenging** standard of rigour in AC: TA is evident in several key ways. The five subjects present teachers and students with specific, discipline-based knowledge and skills. At Year 2, students are building on foundational experiences that are unique to learning in and across The Arts subjects. Subject (discipline)-specific technical and expressive language and practices, unique to each subject, are deployed and used by teachers and students to deepen thinking and learning.

NZC – Rigour

Rigour: Challenging

NZC: TA sets a **challenging** standard of rigour by introducing a broad range of discipline-specific technical and expressive language and practices from Level 1 in each of the four Arts subjects. For example, in Dance, students are challenged to “explore movement, with a developing awareness of the dance elements of body, space, time, energy and relationships”. Opportunities for learning across The Arts disciplines are also foregrounded through development of awareness that each serves a variety of purposes in students' lives and in their communities.

Comparative Analysis

In The Arts curriculum for the early years of schooling, the key differentiating element between AC: TA and NZC: TA is that AC: TA includes five discrete subjects contrasting with NZC: TA which includes only Dance, Drama, Music and Visual Arts as the four Arts subjects through which students will explore and develop artistic and creative processes. In both curricula learning in The Arts can be offered through unique subjects or as integrated, inter-disciplinary learning experiences. In both countries this is generally a matter for school decision.

The underpinning concepts for AC: TA, that students learn as artists and as audience and by making and responding as outlined in *Shape of the Australian Curriculum: The Arts* (ACARA, 2011) are also evident as central to NZC: TA. The organising ideas for each curriculum cover a similar range of interrelated concepts:

Table 3. 25 *Organising ideas in AC: TA and NZC: TA*

AC: TA sub-strands	NZC: TA strands
Exploring ideas and improvising with ways to represent ideas	Understanding in context
Developing understanding of practices	Developing practical knowledge
Sharing artworks through performance, presentation or display	Developing ideas
Responding to and interpreting artworks	Communicating and interpreting

While Media Arts is not included in NZC: TA the depth and breadth required in the other four subjects, particularly regarding the range of elements and principles, are more than that required in AC: TA. For example, in AC: TA at F-2 in Music, the focus is on two elements: pitch and rhythm whereas in NZC: TA beat, rhythm, pitch, tempo, dynamics, and tone colour are all specified at Level 1.

In both curricula student agency shapes the types of inquiry and activity required to deliver the intended content and provide opportunities for students to demonstrate the standard/meet the achievement objectives. The NZC: TA Music-Sound Arts curriculum also includes explicit focus on sound from natural, acoustic and digital environments as the source material for expressive ideas in music. AC: TA offers opportunities for teachers to use these environments without prescribing that teachers should use each one.

Both AC: TA and NZC: TA expect that students will learn about The Arts forms and practices of their country's First Peoples. AC: TA embeds this expectation through content descriptions and identification of opportunities to focus on cross-curriculum priorities. For example, in Media Arts, students "Respond to media artworks and consider where and why people make media artworks, starting with media from Australia including media artworks of Aboriginal and Torres Strait Islander Peoples" (ACAMAR057). NZC: TA outlines expectations in the descriptions of the scope for each Arts subject. For example, in Visual Arts, "An understanding of Māori visual culture is achieved through exploration of Māori contexts. The arts of European, Pasifika, Asian, and other cultures add significant dimensions to New Zealand visual culture" (NZME, 2014k).

Overall, NZC: TA features greater variation in the way that content is articulated across The Arts subjects. The distinctive language of the curriculum for each discipline focuses attention on authentic practice in the discipline.

In summary, the following comparisons can be drawn:

- both curricula give agency to students as both maker and audience and include content relating to the scope and place of The Arts in their lives and communities
- both curricula provide developmentally appropriate arts learning for this age group and introduce ways of knowing and doing specific to each Arts subject
- the spiral design of each curricula provides opportunities for learners to explore ideas and communicate through the Arts in increasingly sophisticated ways
- both AC: TA and NZC: TA are arranged by discipline and specify discrete knowledge and skills for each subject.

Year/Grade Level

Australian Curriculum: Years 5 and 6

New Zealand Curriculum: Levels 3 and 4²³

Learning Area/Subject

Australian Curriculum: The Arts (AC: TA)

New Zealand Curriculum: The Arts (NZC: TA)

Expectations: Knowledge and Skills

The AC: TA Years 5-6 curriculum builds-on and revisits concepts introduced at earlier year levels. In this band students engage with diverse artworks from different times and locations to explore meaning and interpretation and social and cultural contexts of The Arts including the arts of Aboriginal and Torres Strait Islander Peoples and of the Asia region. They make, perform and present works that communicate their ideas and intentions to a variety of audiences. They evaluate use of forms and elements in artworks they make and observe and develop their understanding and use of performance, technical and expressive skills. They also extend their understanding of safety in The Arts. By the end of Year 6, students are expected to articulate and communicate their intentions as artists and to compare ways meaning is communicated in arts works from different social, cultural and historical contexts.

In NZC: TA the content for Level 3 requires students to explore and describe how artworks are used for different purposes in a variety of cultures, investigate the functions and purposes of arts-disciplines in cultural and historic contexts and consider how artworks are valued in past and present cultures. They also investigate how technologies can be used in The Arts and apply this knowledge in their own work. They initiate, express and refine ideas, explore conventions, apply techniques, prepare, rehearse and present performances and describe ways meaning is communicated in art works. In Music-Sound Arts there is a continuing focus on “how music serves a variety of purposes” in the students’ lives and in their communities. Some students may also be working in Level 4 by the end of primary school. At Level 4, requirements emphasise the student as ‘artist’. For example, in Dance students “apply the dance elements to extend *personal* movement skills and vocabularies and to explore the vocabularies of others”.

Measurement of Curriculum: Breadth, Depth and Rigour

	BREADTH			DEPTH			RIGOUR		
	Limited	Fundamental	Comprehensive	Limited	Fundamental	Challenging	Limited	Moderate	Challenging
AC									
NZC		Level 3	Level 4		Level 3	Level 4		Level 3	Level 4

AC – Breadth

Breadth: Comprehensive

The AC: TA at Year 6 builds on a sequence of learning that is designed to engage students with all five subjects. Each subject offers an authentic, discipline-specific arts experience that

²³ For further information about comparative points in this study see Section 3.2 Comparative study: Method

reflects the knowledge and learning expected in that field. At the Years 5-6 band, the curriculum for each Arts subject includes a single content description for each of the four sub-strands: exploring ideas and improvising ways of representing ideas, developing understanding of discipline-specific practice, sharing artworks through performance, presentation or display and responding to and interpreting artworks. This represents **comprehensive** coverage stretching across highly specific content descriptions, that reflect the language and practice of each Arts discipline.

Table 3. 26 AC: TA, F-6 – Structure

Year 2	Australian Curriculum: The Arts				
Subjects (Disciplines)	AC: Dance	AC: Drama	Media Arts	AC: Music	AC: Visual Arts
Strands (making & responding)	2 (NB -these strands are inter-dependent and present in each sub-strand. The strands are not explicitly identified in the curriculum structure)				
Sub-strands	Exploring ideas and improvising ways of representing ideas Developing understanding of discipline-specific practices Sharing artworks through performance, presentation or display Responding to and interpreting artworks				
Content descriptions	4	4	4	4	4
Elaborations (not mandated)	22	26	21	21	25

NZC – Breadth

Breadth: Fundamental (Level 3), Comprehensive (Level 4)

By the end of primary school, students in New Zealand are expected to be achieving at Level 3 in the Arts subjects they have been learning in and beginning to work in Level 4. They may be working at different levels across the Arts subjects – Dance, Drama, Music-Sound Arts and Visual Arts.

At Level 3 the curriculum consolidates themes and concepts introduced in Levels 1 and 2. Students’ learning is broadened from earlier levels through consideration of the Arts in different cultural, social and historical contexts.

At Level 4 the curriculum broadens further, for example, with a focus on use of technologies in Drama and Music and exploration of a broader range of conventions in Visual Arts. Other details such as “extending personal movement skills” and “exploring the [movement] vocabularies of others” also indicate the more **comprehensive** scope of Level 4.

As with Levels 1-2, Media Arts is not included in NZC: TA. Expectations of greater breadth are also communicated through additional achievement objectives, for example, relating to “identify and describe the characteristics of music associated with a range of sound environments in relation to historical, social and cultural contexts” (Understanding the Arts in Context, Level 3).

Table 3. 27 NZC: TA – Structure, Levels 3 and 4

Levels 3-4		New Zealand Curriculum: The Arts			
Strands (Disciplines)		Dance	Drama	Music-Sound Arts	Visual Arts
Sub-strands		Understanding the Arts in Context Developing Practical Knowledge Developing Ideas Communicating and Interpreting			
Achievement Objectives	Level 3	5	4	7	4
	Level 4	5	5	7	4
Elaborations		N/A	N/A	N/A	N/A

AC – Depth

Depth: Challenging

The AC: TA for Years 5-6 is designed to transition students from a broad yet **challenging** range of Arts education experiences at primary school to increasing specialisation in secondary school. The curriculum provides for a diverse range of experiences across all five Arts subjects with a degree of specialisation in at least two subjects. On this basis, the expected depth of learning is assessed as **challenging**. The content specified for each Arts subject in these years requires a learning program underpinned by activities that extend students' thinking and working practices in each of The Arts subjects. Students are expected to plan and respond to art works, explore ideas and practices and ways meaning can be communicated through the arts. There is also a focus on development of technical and expressive skills in the performing arts subjects and the use of elements and principles in Media Arts and Visual Arts.

NZC – Depth

Depth: Fundamental (Level 3), Challenging (Level 4)

Across Levels 3 and 4, NZC: TA transitions students from general learning about The Arts to a more nuanced approach that expects them to apply learning about the work of other artists in work they create and to extend their personal skills and understandings. For example, at Level 3 in Music-Sound arts, students are expected to “Explore and identify how sound is made and changed, as they listen and respond to music and apply knowledge of the elements of music, structural devices, and technologies”. Level 4 requires a more demanding ‘integration’ of the theoretical and practical: “Apply knowledge of the elements of music, structural devices and technologies through integrating aural, practical and theoretical skills”. As with AC: TA, at Level 4 students are expected to “express, develop and refine their ideas” and to “reflect on the qualities of works created by other artists”.

AC – Rigour

Rigour: Challenging

AC: TA intends that by the end of Year 6, students will have developed knowledge, skills and understandings across Dance, Drama, Media Arts, Music and Visual Arts. The extent of students' actual learning will be largely dictated by the range of learning opportunities they have experienced. The detailed expectations, as set out in the curriculum, challenge

students as artists by expecting them to plan, refine and present work with technical and expressive skill, to articulate their intentions for their work. Students are also challenged as audience to explain how works communicate meaning and to compare works from different contexts. On this basis, the level of rigour is deemed to be **challenging**.

NZC – Rigour

Rigour: Moderate (Level 3), Challenging (Level 4)

Across Levels 3 and 4 in NZC: TA, expectations regarding rigour vary between The Arts subjects – Dance, Drama, Music-Sound arts and Visual Arts. For example, at Level 3, in Dance, students are expected to demonstrate their developing practical knowledge by using “the dance elements to develop and share their personal movement vocabulary” whereas in music they are expected to “explore and identify how sound is made and changed, as they listen and respond to music and apply knowledge of the elements of music, structural devices and technologies”. Similarly, at Level 4, in Drama students “initiate and refine ideas with others to plan and develop drama” whereas in music they “express, develop and refine musical ideas, using the elements of music, instruments, and technologies in responses to sources of motivation” and to “represent sound and musical ideas in a variety of ways”. This variation may reflect the capacity of schools to provide specialist teaching across the four Arts subjects. On this basis, the level of rigour is deemed, on balance to be **moderate** at Level 3 and **challenging** at Level 4.

Comparative Analysis

As in the earlier levels key the differentiating feature between AC: TA and NZC: TA is the diversity of The Arts subjects included in the curriculum. AC: TA includes five discrete subjects: Dance, Drama, Media Arts, Music and Visual Arts whereas NZC: TA includes Dance, Drama, Music-Sound Arts and Visual Arts.

The organising ideas for each curriculum in the tables below continue to cover a similar range of interrelated concepts. Student agency as artist and audience (practitioner and thinker) also continues as a central tenet in both curricula. At this level the importance attached to this dual perspective is illustrated through an increasing requirement in both curricula that students describe how ideas and meaning are communicated in arts works and devise/make/present work that communicates ideas and intended meanings.

The range of elements, principles and conventions considered across the five Arts subjects in AC: TA Years 5 and 6 is somewhat broader than those identified in NZC: TA. For example, symbol is not included in the list of elements for Drama although the achievement objectives for Level 4 do offer scope to introduce symbol as an element/concept.

Across all subjects in both curricula there is an increasing focus on use of technologies for in arts practice, for distributing works, and for communicating ideas and thinking about arts practice and works. For example, consideration of material from natural, acoustic and digital sound environments in NZC: TA - Music offers extensive scope for a diverse range of learning activities that introduce 21st approaches to music composition (including recording/notating music ideas), performance and listening and distribution. These types of activities are implied but not prescribed in AC: TA – Music.

At this level both AC: TA and NZC: TA expect that students will continue to learn about The Arts forms and practices of their country's First Peoples. This expectation is outlined through specific content descriptions in AC: TA and through the Learning Area introduction in NZC: TA.

The greater variation in the way that the curriculum is articulated across The Arts subjects in NZC: TA emphasises a focus on authentic practice in each subject.

Year/Grade Level

Australian Curriculum: Year 10

New Zealand Curriculum: Levels 5 and 6²⁴

Learning Area/Subject

Australian Curriculum: The Arts (AC: TA)

New Zealand Curriculum: The Arts (NZC: TA)

Expectations: Knowledge and Skills

AC: TA for Years 7-8 and 9-10 uses the same structure as that of the F-6 curriculum. It is expected that students will continue Arts learning with increasing specialisation, for example, through elective choices. Decisions about how students in Years 7-8 and 9-10 access The Arts curriculum are made at a local level.

In each of The Arts subjects, at Years 9-10 students focus on refining and extending their awareness of, understanding of, and facility in using the materials and constructs of each of The Arts disciplines. In their practice and as audience, students draw on works from a range of cultures, times and locations including works by Aboriginal and Torres Strait Islander Peoples and artists from the Asia region. They consider how ideas can be represented and explore directions in contemporary practice and developments in traditional styles/genres. They also consider local, global, social and cultural contexts that influence arts works and evaluate the implications of this for their practice and that of others.

Additional complexity is introduced through inclusion of content descriptions in 3 of the 4 sub-stands:

²⁴ For further information about comparative points in this study see Section 3.2 Comparative study: Method

Table 3. 28 AC: TA – sub-strands 7-10

Foundation – 6 sub-strands and content descriptions	7-10 sub-strands and content descriptions
Exploring ideas and improvising with ways to represent ideas	Exploring ideas and improvising with ways to represent ideas Manipulating and applying the elements/concepts with intent
Developing understanding of practices	Developing and refining understanding of skills and techniques Structuring and organising ideas into form
Sharing artworks through performance, presentation or display	Sharing artworks through performance, presentation or display
Responding to and interpreting artworks	Analysing and reflecting on intentions Responding to and interpreting artworks

Students in New Zealand schools are most likely to be working in Level 5 in Years 9 and 10. They are expected to be learning in at least two Arts disciplines.

At Level 5, the curriculum for each of the Arts subjects focuses on comparing and contrasting or investigating characteristics of works from different contexts and cultures; developing skills, techniques, vocabularies and practice; using relevant technologies; manipulating elements, principles and devices and applying conventions to create works, selecting and refining ideas; considering ways ideas and processes are used to communicate meaning and reflecting on qualities of their own works and those of others.

At Level 6, students consider the features, form and background/context of works from historical and contemporary contexts; apply research, knowledge of elements, conventions, principles, technologies as they create, structure, refine and evaluate works. They sequence and link ideas, use imaginative thinking and personal understandings and consider and reflect on the contexts of their own works and others' works. Students also investigate, interpret, analyse and evaluate intentions, ideas and meanings communicated in works by others.

Measurement of Curriculum: Breadth, Depth and Rigour

	BREADTH			DEPTH			RIGOUR		
	Limited	Fundamental	Comprehensive	Limited	Fundamental	Challenging	Limited	Moderate	Challenging
AC									
NZC		Level 5	Level 6		Level 5	Level 6		Level 5	Level 6

AC – Breadth

Breadth: Comprehensive

The breadth of The Arts offering in the AC is regarded as **comprehensive** because it represents sustained, discipline-based learning opportunities for students in a range of specialised subjects. At this level, seven content descriptions are provided across the four

sub-strands. Each of these includes aspects of the underpinning strands: making and responding.

For each of The Arts subjects, breadth is represented through the range of practice and scope of analysis and reflection outlined in the content descriptions. For example, in Media Arts, students develop their understanding of and use structure, intent, character settings, points of view, genre conventions and media conventions. They also use a range of technologies and explore possibilities for exploiting use of elements and principles such as time, space, sound, movement and lighting in their work. They learn to maintain safe and ethical practices. They explore representations of relationships between Aboriginal and Torres Strait Islander Peoples and other cultures and consider how these may influence their own intentions as makers. They consider local, global, social and cultural contexts as artists and as audience and evaluate meaning and interpretation, formals and elements and the social and ethical implications and influences of media arts works and practice.

Table 3. 29 AC: TA, 7-10 – Structure

Year 2	Australian Curriculum: The Arts				
Subjects (Disciplines)	AC: Dance	AC: Drama	Media Arts	AC: Music	AC: Visual Arts
Strands (making & responding)	2 (NB -these strands are inter-dependent and present in each sub-strand. The strands are not explicitly identified in the curriculum structure)				
Sub-strands	Exploring ideas and improvising ways of representing ideas Manipulating and applying the elements/concepts with intent Developing and refining understanding of skills and techniques Structuring and organising ideas into form Sharing artworks through performance, presentation or display Analysing and reflecting on intentions Responding to and interpreting artworks				
Content descriptions	7	7	7	7	7
Elaborations (not mandated)	38	31	33	36	38

NZC – Breadth

Breadth: Fundamental (Level 5), Comprehensive (Level 6)

Across Levels 5 and 6, expectations regarding breadth are represented in different ways as appropriate to each of The Arts subjects – Dance, Drama, Music-Sound Arts and Visual Arts. This authentic language and weighting of strands emphasises differences in the practices of each of The Arts disciplines.

For example:

- in Music-Sound Arts, at Level 5 students develop their compare characteristics of music associated with a range of sound environments in relation to historical, social and cultural contexts; at Level 6 they analyse music from a range of sound environments, styles and genres in relation to the same range of contexts

- in Dance, students develop practical knowledge of a variety of skills, dance techniques, vocabularies and movement practices at Level 5. At Level 6 they develop and demonstrate skills in selected dance genres and styles and explore the use of a variety of technologies
- Developing ideas, at Level 5 in Drama involves selecting and refining ideas to develop drama for specific purposes whereas at Level 6 students research, evaluate and refine ideas in a range of dramatic forms to develop drama
- In Visual Arts, expected breadth develops from comparing and contrasting ways ideas and art-making processes are used to communicate meaning at Level 5 to identifying and analysing processes and procedures and investigating, analysing and evaluate ideas and interpreting artists' intentions at Level 6.

From Level 6, the statements provided for the Key Concepts: 'connections', 'invention' and 'transformation' are critical in understanding how the strands are inter-related and to unpack the increasing sophistication embedded in the achievement objectives. For example, in Music, the following statements are provided in relation to Imagination and connection: "The creative processes of music-sound arts require the generation, refinement, and revision of musical and sound ideas through composing and performing, whether individually or collaboratively" and "Visions of sound are constructed, co-constructed, and re-constructed, creating new sounds and combinations through the use of musical conventions and technologies" (NZME, 2012e).

AC – Depth

Depth: Challenging

In AC: TA at the end of Year 10, students are expected to have attained deep learning in the Arts subject(s) of their choosing. The content descriptions are explicit for each subject and indicate the **challenging** level of depth across the sub-strands. Across The Arts subjects at this level, students are challenged to consider personal, local, national and global contexts as well as ethical and sustainable approaches to practice. For example, in Visual Arts, students "adapt ideas, representations and practices from selected artists and use them to inform their own personal aesthetic when producing a series of artworks that are conceptually links and present their ideas to an audience" and in Media Arts, students "evaluate the social and ethical implications of media arts".

NZC – Depth

Depth: Fundamental (Level 5), Challenging (Level 6)

Level 5 in NZC: TA outlines content that requires students to engage with all fundamental (foundational) aspects of practice in The Arts subjects they are studying. They are also asked to compare and contrast work and to reflect on how ideas, feelings, moods, experiences and intentions are communicated through Arts works. At Level 6, an increase in the expected depth of learning is outlined through complex achievement objectives such as "perform and respond to drama and make critical judgements about how elements, techniques, conventions and technologies are used to create form and meaning in their own and others' work". Students studying more than one of The Arts subjects at Level 6 will be further challenged by the diversity of expectations between subjects. For example, to meet

the 'understanding in context' achievement objective in Dance, students will "explore, investigate and describe the features and backgrounds of a variety of dance genres and styles", in Drama they will "investigate the forms and purposes of drama in different historical or contemporary contexts, including New Zealand drama", in Music, they will "analyse music from a range of sound environments, styles and genres in relation to historical, social and cultural contexts and consider and reflect on the influence of music in their own music-making and their lives".

AC – Rigour

Rigour: Challenging

In AC: TA, the **challenging** level of rigour is evident in all five of The Arts subjects offered to Year 10 students. These expectations are identifiable in the multiple higher-order processes and products required by the content descriptions and in the ways that students are expected to engage with the practices of artists and audience. 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". In each of the subjects, expectations that students will develop a 'personal' style also establishes the level required as **challenging**.

NZC – Rigour

Rigour: Moderate (Level 5), Challenging (Level 6)

As with expectations regarding breadth and depth, Level 6 in NZC: TA is more rigorous than Level 5. The range of activities, particularly the mix of practice, research and analysis/evaluation along with reflection all contribute to the level of rigour. For example, in Music-Sound Arts at Level 6, students are required demonstrate their skill in 'Developing ideas' when they "create, structure, refine and represent compositions using the elements of music, instruments, technologies and conventions to express imaginative thinking and personal understandings". They are also asked to "reflect on composition processes and presentation conventions". Verbs associated higher order thinking and complex phrases that ask students to act as 'artist' and as 'audience' also communicate a challenge level of rigour. For example, in Visual Arts, "students identify and analyse processes and procedures from established practice that influence ways of communicating meaning".

Comparative Analysis

AC: TA and NZC: TA take different approaches to describing similar expectations regarding breadth, depth and rigour as students reach the end of their compulsory years of school. Connections to knowledge, skills, processes and dispositions that develop in senior secondary studies are emphasised.

For Years 7-10 AC: TA revises the underlying structure, introducing additional sub-strands to emphasise expectations around the complexity of practice and the extent of analysis and evaluation required. In the curriculum for the Years 9-10 band this allows for a focus on development of 'personal' style through, for example, in Music, students "... explore a

personal style in composition and performance” [ACAMUM099], “evaluate a range of music and compositions to inform and refine their own compositions and performances” [ACAMUM104] and “analyse a range of music from contemporary and past times to explore differing viewpoints and enrich their music-making ...” [ACAMUM105]

NZC: TA communicates the more complex expectations for these Levels through additional points within the achievement objectives for each of the four Arts subjects. Placement of this additional content varies across The Arts subjects. The variety of verbs and complex phrases used in the achievement objectives also makes expectations very clear. At this level, students in New Zealand are beginning senior secondary studies. The five principles that inform a progression of learning: complexity, control, depth, independence and consciousness, and advice about how the ‘Key principles inform progression’ emphasise the importance of student voice and style at this level. For example, regarding independence and consciousness: “Students become increasingly autonomous and self-directed and depend less on teacher direction and support” and “Students are increasingly able to deliberate on and structure their works and articulate their thinking and choices” (NZME, 2014l).

The Five Key Principles (NZME, 2016d) that inform progression in The Arts articulate how the strands are inter-related also illustrate the level of sophistication required as students move into senior secondary studies.

Additional Observations

At each level, AC: TA provides opportunities for students to develop each of the general capabilities (ACARA, 2018i) as they learn in and through Arts subjects. The Key Concepts/Big ideas and Key principles outline how NZC: TA provides opportunities for activities that will build students competency in thinking, relating to others, using language, symbols and texts, managing self and participating and contributing (NZME, 2014c).

The approach to embedding study of works, traditions and contemporary practices of each country’s First Peoples varies between AC: TA and NZC: TA. In AC: TA specific references are included in content descriptions, particularly the *Responding and interpreting* sub-strand at each level. In NZC: TA expectations regarding study of Māori arts’ works and practices are outlined in the introduction to the curriculum. A few references are also included in the achievement objectives. Both curricula establish expectations that schools will consult and work with local communities to ensure that all students learn about the rich and dynamic arts traditions of the First Peoples.

f) Learning area: Technologies

Comparative Curricula

Australian Curriculum

Version 8.3, 2016

New Zealand Curriculum

2017

Year/Grade Level

Australian Curriculum: Year 2

New Zealand Curriculum: Level 1²⁵

Learning Area/Subject

Australian Curriculum: Technologies (AC: T)

New Zealand Curriculum: Technology (NZC: T)

This section is a comparative study of the AC: Technologies and The NZC: Technology. All references in this section are sourced from the curriculum documents AC: F-10: Technologies (ACARA, 2018f), The NZC: Technology (NZME, 2018i) and The NZC: Achievement objectives by learning area (2007d), unless otherwise stated.

Expectations: Knowledge and Skills

The expected learning for 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.

In New Zealand, similarly to Australia, Technology education is addressed through a Technology learning area. The expected learning for NZC: T Level 1 is presented in two ways, through achievement objectives and progress outcomes²⁶. In NZC: T the expectations for the three strands (Technology knowledge; Nature of technology and Technology practice) are presented as achievement objectives. At Level 1 the content from the technological areas: designing and developing materials outcomes; designing and developing processed outcomes; and design and visual communication is addressed in cross-curricular units. The expectation for the technological area 'computational thinking for digital technologies' for Level 1 aligns to progress outcome 1. Progress outcome 1 describes the first of eight learning steps for 'computational thinking for digital technologies'. Whereas Level 1 for the technological area 'designing and developing digital outcomes' aligns with working towards

²⁵ For further information about comparative points in this study see Section 3.2 Comparative study: Method

²⁶ Progress outcomes describe the significant learning steps that students take as they develop their expertise utilising the same design as the Learning Progression Frameworks [Personal communication, NZME, 2019]

progress outcome 1. The digital technologies-related areas are addressed through other learning areas and should not only contribute to students' digital technologies knowledge and skills but also their digital citizenship capabilities.

Measurement of Curriculum: Breadth, Depth and Rigour

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

AC – Breadth

Breadth: Comprehensive

For students at the end of Year 2, the expectations of 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. 30 Number of content descriptions in AC: T, Year 2

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

NZC – Breadth

Breadth: Fundamental

For students in Level 1, the expectations of NZC: T are **fundamental** in relation to breadth of coverage. They are expected to address nine achievement objectives across five technological areas. The content is presented in three strands: Technological knowledge;

Nature of technology and Technological practice. The five technological areas are: designing and developing materials outcomes; designing and developing processed outcomes; design and visual communication; computational thinking for digital technologies and designing and developing digital outcomes. These areas focus on three distinct outcomes: materials, digital and processed and provide a context for learning.

Table 3. 31 *Number of assessment objectives in NZC: T, Level 1*

Level 1 Technology	Strand: Technological practice	Strand: Technological knowledge	Strand: Nature of technology
	4	3	2

AC – Depth

Depth: Fundamental

For students at the end of Year 2, the expectations of 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 Australian Curriculum’s ACTDEK001 asks that learners ‘consider sustainability to meet personal and local community needs’ (ACARA, 2018f).

NZC – Depth

Depth: Fundamental

For students at Level 1, the expectations of NZC: T are deemed to be **fundamental**. For example, in progress outcome 1 for ‘designing and developing digital outcomes’, students are working towards “identify[ing] digital devices and their purposes and understand[ing] that humans make them”. At Level 1 in ‘computational thinking for digital technologies’, “students use their decomposition skills to break down simple non-computerised tasks into precise, unambiguous, step-by-step instructions”. In an achievement objective for ‘technological knowledge’ students “understand that technological products are made from materials that have performance properties”.

As the descriptions for the non-digital technological areas are not stated for each level it is difficult to gauge the depth. The depth is determined to an extent through the achievement objectives for the strands. The achievement objective for ‘characteristics of technology’ in the strand ‘nature of technology’ that students “understand that technology is purposeful intervention through design” could be limited, whereas ‘technological modelling’ in ‘technological knowledge’ indicates students “understand that functional models are used to represent reality and test design concepts and that prototypes are used to test technological outcomes ...” which implies a relatively deep understanding of technological modelling. On balance the depth is considered fundamental (NZME, 2018q).

AC – Rigour

Rigour: Moderate

In general, the level of rigour of 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, 2018f). 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.

NZC – Rigour

Rigour: Moderate

In general, the level of rigour of NZC: T is deemed to be **moderate**. The cognitive demand placed on Level 1 students in terms of the achievement objectives is difficult to determine as a number of achievement objective statements use the verb ‘understand’. The rigour is clearer in statements that are more explicit, for example for ‘outcome development and evaluation’, students “investigate a context to communicate potential outcomes, evaluate these against attributes; select, and develop an outcome ...”.

In progress outcome 1 for ‘computational thinking for digital technologies’ the rigour is challenging when “they give these [step-by-step] instructions, identify any errors in them as they are followed, and correct them (simple debugging)”. The rigour is generally moderate but could be greater depending on how it is implemented. (NZME, 2018q)

Comparative Analysis

The depth and rigour of AC: T and NZC: T are comparable. The main difference is in terms of breadth. The breadth of learning in AC: T is more comprehensive as there is greater specification. In NZC: T teachers determine the breadth to a greater extent.

The description of NZC: T and the rationale are very similar to AC: T. The three strands in NZC: T align closely with the two strands of AC: T. The NZC: T strands of *Technology knowledge* and *Nature of technology* comprise content that is very similar to the knowledge and understanding strand of AC: T subjects. The Technology practice strand of NZC: T aligns closely with AC: T processes and production skills strand for both subjects. The main difference in structure is in terms of how expectations of students are expressed. In AC: T these expectations are presented in an achievement standard for the band Foundation to Year 2. In NZC: T the expectations for the three strands are presented as achievement objectives and broadly reflect aspects of the five technological areas. There is no explicit expectation at Level 1 for three technological areas (designing and developing materials outcomes; designing and developing processed outcomes; and design and visual communication). The expectations for the digital technology-related technological areas (‘computational thinking for digital technologies’ and ‘designing and developing digital outcomes’) are presented as progress outcomes. The progress outcomes are a new feature

of The NZC and are designed to describe the significant learning steps for students within the strands ‘computational thinking for digital technologies’ and ‘designing and developing digital outcomes’. The outcomes are grounded in “data collected during the development of the digital learning progressions”. (NZME, 2018r) The alignment of progress outcomes to Level 1 for each of these strands varies.

As with AC: T the strands of NZC: T are integrated in teaching and learning. Unlike AC: T, NZC: T is not divided into two subjects. Instead the content is presented as five technological areas that provide context for the strands. The digital technology-related technological areas are addressed from Years 1–8 through other learning areas. While in AC: T, Digital Technologies is presented as a separate subject, the content, particularly from Foundation to Year 2 is often integrated through other learning areas. The learning areas provide the context for applying the knowledge, understanding and skills of Digital Technologies.

The NZC: T technological areas of ‘computational thinking for digital technologies’ and ‘designing and developing digital outcomes’ address similar content to AC: T subject Digital Technologies and the general capability Information and Communication Technology Capability.

Apart from AC: T technologies context ‘engineering principles and systems’ there is a close alignment between the technological areas of NZC: T and the technologies contexts of AC: Design and Technologies (see Table 3.32 below). The NZC: T technological area of ‘design and visual communication’ however aligns more closely with AC: T processes and production skills strand thread of ‘generating and designing’. The specifics of which are reflected in the content descriptions.

Table 3. 32 *Alignment of technologies contexts and technological areas*

AC: T (technologies contexts: Design and Technologies)	NZC: T technological areas
Materials and technologies specialisations	Designing and developing materials outcomes
Food and fibre production/Food specialisations	Designing and developing processed outcomes*
Engineering principles and systems	

* Food and nutrition is also addressed as a focus area in NZC: Health and physical education.

While the curriculum structures of AC: T and NZC: T are different, the intent of creating solutions and the focus on design is similar. There is considerable complementarity between the digital technologies components of both.

Year/Grade Level

Australian Curriculum: Year 6

New Zealand Curriculum: Level 3²⁷

Learning Area/Subject

Australian Curriculum: Technologies (AC: T)

New Zealand Curriculum: Technology (NZC: T)

Expectations: Knowledge and Skills

The expected learning for 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.

In New Zealand, similarly to Australia, Technology education is addressed through a Technology learning area. The expected learning for NZC: T Level 3 is presented in two ways, through achievement objectives and progress outcomes. In NZC: T the expectations for the three strands (Technology knowledge; Nature of technology and Technology practice) are presented as achievement objectives. At Level 3 the content from the technological areas: designing and developing materials outcomes; designing and developing processed outcomes; and design and visual communication is addressed in cross-curricular units. The expectations for the technological area 'computational thinking for digital technologies' Level 3 aligns to progress outcome 2. Whereas Level 3 for the technological area 'designing and developing digital outcomes' aligns with working towards progress outcome 2. The digital technologies-related areas are addressed through other learning areas and should not only contribute to students' digital technologies knowledge and skills but also their digital citizenship capabilities.

Measurement of Curriculum: Breadth, Depth and Rigour

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

²⁷ For further information about comparative points in this study see Section 3.2 Comparative study: Method

AC – Breadth

Breadth: Comprehensive

For students at the end of Year 6, the expectations of 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.

NZC – Breadth

Breadth: Fundamental

For students in Level 3, the expectations of NZC: T are **fundamental** in relation to breadth of coverage. They are expected to address twelve assessment objectives across five technological areas. The content is presented in three strands: (Technology knowledge; Nature of technology and Technology practice). The five technological areas are: designing and developing materials outcomes; designing and developing processed outcomes; design and visual communication; computational thinking for digital technologies and designing and developing digital outcomes. These areas focus on three distinct outcomes: materials, digital and processed and provide a context for learning.

Table 3. 33 *Number of assessment objectives in NZC: T, Level 3*

Level 3 Technology	Strand: Technological practice	Strand: Technological knowledge	Strand: Nature of technology
	7	3	2

AC – Depth

Depth: Challenging

For students at the end of Year 6, the expectations of 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), 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.

NZC – Depth

Depth: Fundamental

For students at Level 3, the expectations of NZC: T are deemed to be **fundamental**. For example, in working towards progress outcome 2 for ‘designing and developing digital outcomes’, “they understand that digital devices impact on humans and society and that both the devices and their impact change over time”. A more challenging outcome is “students make decisions about creating, manipulating, storing, retrieving, sharing and testing digital content ...”. However, on balance the depth is fundamental, particularly as the descriptions for the non-digital technological areas are not stated.

To an extent the depth can be determined through the achievement objectives for the strands but it is not explicit. The achievement objective for ‘outcome development and evaluation’ in the strand ‘technological practice’: “trial and evaluate these [ideas] against key attributes to select and develop an outcome to address the need or opportunity” provides opportunities for depth, whereas most other objectives are less explicit such as “understand that technological outcomes are recognizable as fit for purpose by the relationship between their physical and functional natures”. This could be addressed by schools in some depth but could equally be quite basic. (NZME, 2018q)

AC – Rigour

Rigour: Challenging

The rigour of 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, 2018f). Multiple elaborations provide pedagogical suggestions for how the content descriptions could be addressed in the classroom; several of these identify opportunities for increased rigour.

NZC – Rigour

Rigour: Challenging

In general, the level of rigour of NZC: T is deemed to be **challenging**. The cognitive demand placed on Level 3 students in terms of the achievement objectives is difficult to determine as a number of achievement objective statements use the verb ‘understand’. The rigour is greater and clearer in statements that are more explicit, for example for ‘planning for practice’, students will “revisit planning to include reviews of progress and identify implications for subsequent decision making”.

In working towards progress outcome 2 for ‘designing and developing digital outcomes’ the rigour is challenging when students “identify the specific role of components in a simple input-process-output system and how they work together” but moderate when they “select

from an increasing range of applications and file types ...” On balance though the rigour is challenging. (NZME, 2018q)

Comparative Analysis

The rigour of AC: T and NZC: T are comparable, however, in terms of breadth and depth there are differences. The breadth of learning in AC: T is more comprehensive as there is greater specification. The depth of learning on the surface appears to be greater in AC: T due to the detail provided and the way the curriculum is described. The depth of NZC: T is less easy to determine because of the way the achievement objectives are expressed, in many cases using the phrase ‘students will understand...’.

There is no explicit expectation at Level 3 for three technological areas (designing and developing materials outcomes; designing and developing processed outcomes; and design and visual communication). Whereas the expectations for the digital technology-related technological areas (‘computational thinking for digital technologies’ and ‘designing and developing digital outcomes’) are presented as progress outcomes. Progress outcome 2 aligns with Level 3 for ‘computational thinking for digital technologies’. It is quite concise and focused on algorithms. Students at Level 3 are working towards progress outcome 2 for ‘designing and developing digital outcomes’. Most expectations are challenging.

The progress outcomes are grounded in “data collected during the development of the digital learning progressions” (NZME, 2018q). Douglas and Thomas (2018) outline the complex nature of developing the progress outcomes: “Because learning is a complex, iterative and uneven process, it is challenging to develop progressions using detailed, small steps to show how a diverse group of students develop expertise. For this reason the learning progressions developed for the New Zealand education system signpost just the significant steps that students take as they develop their expertise in a particular aspect or dimension of learning”.

As with AC: T the strands of NZC: T are integrated in teaching and learning. Bell and Duncan (2015) outline the need for teachers to bring their pedagogical knowledge to the implementation of NZC: T “Some overseas curricula specifically list collaboration; however, in the light of the NZ curriculum and good pedagogy, collaborative work should be expected at all levels”.

Unlike AC: T, NZC: T is not divided into two subjects. Instead the content is presented as five technological areas that provide context for the strands. The digital technology-related technological areas are addressed from Years 1–10 through other learning areas. While in AC: T, Digital Technologies is presented as a separate subject, the content is often integrated through other learning areas. The learning areas provide the context for applying the knowledge, understanding and skills of Digital Technologies.

The NZC: T technological areas of ‘computational thinking for digital technologies’ and ‘designing and developing digital outcomes’ address similar content to AC: T subject Digital Technologies and the general capability Information and Communication Technology Capability.

Apart from AC: T technologies context ‘engineering principles and systems’ there is a close alignment between the technological areas of NZC: T and the technologies contexts of AC: Design and Technologies. See Table 3.34 below. The NZC: T technological area of ‘design and visual communication’ however aligns more closely with AC: T processes and

production skills strand thread of ‘generating and designing’. The specifics of which are reflected in the content descriptions.

Table 3. 34 *Alignment of technologies contexts and technological areas*

AC: T (technologies contexts: Design and Technologies)	NZC: T technological areas
Materials and technologies specialisations	Designing and developing materials outcomes
Food and fibre production/Food specialisations	Designing and developing processed outcomes*
Engineering principles and systems	

* Food and nutrition is also addressed as a focus area in The NZC: Health and physical education.

Although AC: Digital Technologies and NZC: T are structured differently, they are comparable in terms of learning intent and content expectations. The AC: Digital Technologies is explicit in its content descriptions, providing teachers with a process for development of students’ skills, knowledge and understanding. The NZC: T have two technological areas which are guided by learning progressions as stated by Douglas and Thomas (2018) “the learning progressions in the New Zealand system do not tell teachers how students should move between the signposts: they are not a teaching and learning programme. Instead, the space between the signposts is where teaching and learning occurs: this is the space that is personalised or customised in ways that are culturally responsive and relevant to each learner, as well as non-linear.”

While the curriculum structures of AC: T and NZC: T are different, the intent of creating solutions and the focus on design are similar. There is considerable complementarity between the digital technologies components of both.

Year/Grade Level

Australian Curriculum: Year 10

New Zealand Curriculum: Level 5²⁸

Learning Area/Subject

Australian Curriculum: Technologies (AC: T)

New Zealand Curriculum: Technology (NZC: T)

Expectations: Knowledge and Skills

The expected learning for the Australian Curriculum: Technologies (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: Design and Technologies and Digital Technologies. States and territories may offer other Technologies electives that do not duplicate the content of 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 Design and Technologies, 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 Digital Technologies, 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.

In New Zealand, similarly to Australia, Technology education is addressed through a Technology learning area. The expected learning for NZC: T Level 5 is presented in two ways, through achievement objectives and progress outcomes. In NZC: T the expectations for the three strands (Technology knowledge; Nature of technology and Technology practice) are presented as achievement objectives. At Level 5 the content from the technological areas: designing and developing materials outcomes; designing and developing processed outcomes; and design and visual communication can be addressed in Technology as a subject or as cross-curricular units. The expectations for the technological area 'computational thinking for digital technologies' Level 5 aligns to progress outcome 5. Whereas Level 5 for the technological area 'designing and developing digital outcomes' aligns with progress outcome 3. There are explicit expectations for students' knowledge and skills of digital technologies by the end of Year 10. Schools may offer students the opportunity to specialize in a technological area.

Measurement of Curriculum: Breadth, Depth and Rigour

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

²⁸ For further information about comparative points in this study see Section 3.2 Comparative study: Method

AC – Breadth

Breadth: Comprehensive

For students at the end of Year 10, the expectations of 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, Design and Technologies and Digital Technologies. 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 have had the opportunity to design and produce designed solutions for one or more of these contexts. In Digital Technologies, they develop knowledge and understanding of digital systems and the representations of data. In Digital Technologies, students analyse problems and design, implement and evaluate a range of digital solutions including using object-oriented programming.

Table 3. 35 Number of content descriptions 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

NZC – Breadth

Breadth: Fundamental

For students in Level 5, the expectations of NZC: T are **fundamental** in relation to breadth of coverage. They are expected to address thirteen assessment objectives across five technological areas. The content is presented in three strands: Technology knowledge; Nature of technology and Technology practice. The five technological areas are: designing and developing materials outcomes; designing and developing processed outcomes; design and visual communication; computational thinking for digital technologies and designing and developing digital outcomes. These areas focus on three distinct outcomes: materials, digital and processed and provide a context for learning.

Table 3. 36 Number of assessment objectives in NZC: T, Level 5

Level 5 Technology	Strand: Technological practice	Strand: Technological knowledge	Strand: Nature of technology
	7	3	3

AC – Depth

Depth: Challenging

For students at the end of Year 10, the expectations of AC: T are deemed to be **challenging**. The AC: Design and Technologies 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.

NZC – Depth

Depth: Challenging

For students at the end of Level 5, the expectations of NZC: T are deemed to be **challenging**. For example, in progress outcome 3 for ‘designing and developing digital outcomes’, students are “taking into account immediate social, ethical and end-user considerations” and for progress outcome 5 for ‘computational thinking for digital technologies’ students “independently decompose problems into algorithms” and “use these algorithms to create programs with inputs, outputs, sequence, selection using comparative and logical operators and variables of different data types, and iteration”.

While the achievement objectives for ‘technological modelling’ in the strand ‘technological knowledge’ are all expressed in terms of understanding, the required content provides rich opportunities for depth, for example, “understand how evidence, reasoning, and decision making in functional modelling contribute to the development of design concepts”, and in ‘outcome development and evaluation’ in the ‘technological practice’ strand when students “undertake ongoing functional modelling and evaluation that takes account of key stakeholder feedback and trialing in the physical and social environments” (NZME, 2018q).

AC – Rigour

Rigour: Challenging

The rigour of 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.

NZC – Rigour

Rigour: Challenging

In general, the level of rigour of NZC: T for Level 5 is deemed to be **challenging**. While the cognitive demand placed on Level 5 students in terms of the achievement objectives is difficult to determine as a number of achievement objective statements use the verb ‘understand’, the intent of the objectives is challenging and a number have clearly rigorous expectations. For example, in the ‘technological practice’ strand, students will: “analyse their own and others’ planning practices to inform the selection and use of planning tools”; “justify the nature of an intended outcome in relation to the need or opportunity” and “evaluate the final outcome’s fitness for purpose against the brief”.

In progress outcome 5 for ‘computational thinking and digital technologies’, students “determine when to use different types of control structures” and “... develop programs considering human-computer interaction (HCI) heuristics” (NZME, 2018q).

Comparative Analysis

The depth and rigour of AC: T and NZC: T are comparable. However, the breadth of learning in AC: T is more comprehensive as there is greater specification. The breadth of the enacted curriculum may be comparable. In AC: T the expectation is that students will address four technologies’ contexts by the end of Year 8 and students can elect to study either or both Design and Technologies and Digital Technologies.

There is no explicit expectation in NZC: T at Level 5 for three technological areas (designing and developing materials outcomes; designing and developing processed outcomes; and design and visual communication). Whereas the expectations for the digital technology-related technological areas (‘computational thinking for digital technologies’ and ‘designing and developing digital outcomes’) are presented as progress outcomes. Progress outcome 5 aligns with Level 5 for ‘computational thinking for digital technologies’. Students at Level 5 are expected to achieve progress outcome 3 for ‘designing and developing digital outcomes’.

There is also a statement in NZC: T about expectations by the end of Year 10 in relation to students’ digital technological knowledge and skills. There are similarities in this statement to the Year 10 achievement standard in AC: T. For example, in NZC: T students “... decompose a computational problem into an algorithm ... to create a program incorporating inputs, outputs, sequence, selection and iteration”; and in AC: T students “define and decompose complex problems in terms of functional and non-functional requirements ... design and evaluate user experiences and algorithms ... design and implement modular programs, including an object-oriented program, using algorithms and data structures involving modular functions ...”. The differences are in the degree of specification, such as ‘object-oriented programming’ and the references to ‘data’ in AC: T.

Unlike AC: T, NZC: T is not divided into two subjects. There is a greater valuing of the digital technology-related technological areas than those aligned to the AC Design and Technologies. Apart from AC: T technologies’ context ‘engineering principles and systems’ there is a close alignment between the technological areas of NZC: T and the technologies contexts of AC: Design and Technologies. See Table 3.37 below. The NZC: T technological area of ‘design and visual communication’ however aligns more closely with AC: T processes

and production skills strand thread of ‘generating and designing’. The specifics of which are reflected in the content descriptions.

Table 3. 37 Alignment of technologies contexts and technological areas

AC: T (technologies contexts: Design and Technologies)	NZC: T technological areas
Materials and technologies specialisations	Designing and developing materials outcomes
Food and fibre production/Food specialisations	Designing and developing processed outcomes*
Engineering principles and systems	

*The NZC: Health and physical education (HPE) subject ‘Home economics’ also reflects aspects of AC: T technologies context food specialisations as students select, prepare, cook and serve food taking into consideration well-being and nutrition. The achievement objectives of NZC: T however align more closely to AC: T technologies context food specialisation than any of NZC: HPE achievement objectives which do not explicitly highlight food, nutrition or food preparation at Level 5. Food and nutrition is however identified as one of the seven key areas of learning in NZC: HPE.

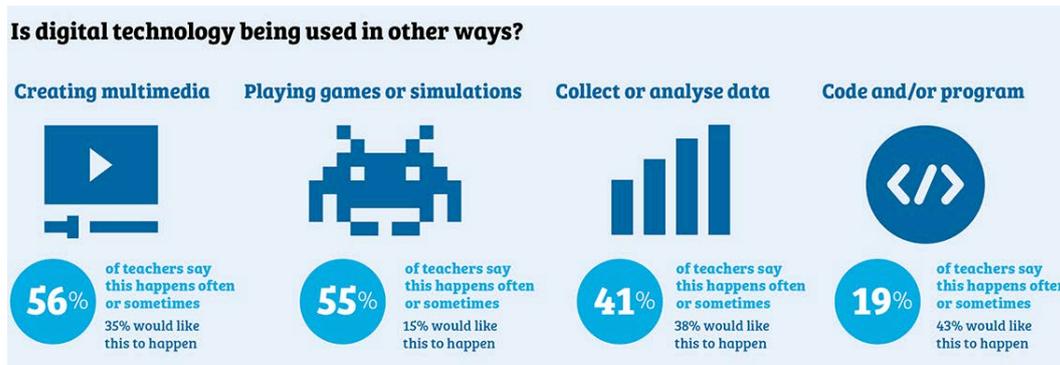
Some aspects of NZC: T progress outcomes for ‘designing and developing digital outcomes’ that align to Level 5 relate more closely to the ICT Capability, for example, students “identify the key features of selected software and choose the most appropriate software and file types to develop and combine digital content”.

While the curriculum structures of AC: T and NZC: T are different the intent of creating solutions and the focus on design is similar. There is considerable complementarity between the digital technologies components of both.

Additional Observations

- Unlike in AC: T where design thinking is addressed across the curriculum, in NZC: T it is applied in the technological area of ‘design and visual communication’. This technological area is very similar to AC: T processes and production skills strand which in AC: T is integrated with the technologies contexts of the knowledge and understanding strand.
- In 2018, new content was added to the Māori-medium curriculum. In the Hangarau Matahiko there are two new areas of focus:
 - Te Whakaaro Rorohiko (Computational thinking) – includes using te reo Māori to express problems, formulate solutions and solve them using algorithms, program and data representation.
 - Tangata me te Rorohiko (People and computers) – includes designing and developing digital outcomes while considering their role and responsibility as digital citizens.
- The NZME (2017c) states, “Each school, kura and wharekura will be able to design their own curriculum around the Digital Technologies and Hangarau Matihiko content to suit their own views and philosophies”
- Current timeline for NZC: T implementation:
 - 2014-2017 (Ready Phase) – Understanding what changes are needed to the curricula to ensure tamariki have the skills to navigate the future.

- 2018-2019 (Set Phase) – Programs, support and initiatives to help teachers and kaiako get ready for strengthened Digital technologies & Hangarau Matihiko curriculum content.
- 2020 (Go Phase) – The strengthened Digital Technologies & Hangarau Matihiko curriculum content being taught in schools and kura. (NZME, 2017c)
- Key findings from the NZ 2016 national survey of primary and intermediate schools can be found at the website. An example of the data collected is shown in figure 3.2 below:



From “Digital technologies for learning: Is digital technology being used in other ways?” by New Zealand Council for Educational Research”, 2016 (<https://www.nzcer.org.nz/infographic-digital-technologies-learning>). Copyright by the New Zealand Council for Educational Research. Reprinted with permission.

Figure 3. 2 Digital technologies for learning: Is digital technology being used in other ways?

g) Learning area: Health and Physical Education

Comparative Curricula

Australian Curriculum

New Zealand Curriculum

Version 8.3, 2016

2007

Year/Grade Level

Australian Curriculum: Years 1 and 2

New Zealand Curriculum: Level 1 and Level 2²⁹

Learning Area/Subject

Australian Curriculum: Health and Physical Education (AC: HPE)

New Zealand Curriculum: Health and Physical Education (NZC: HPE)

This section is a comparative study of the AC: Health and Physical Education and The NZC: Health and Physical Education. All references in this section are sourced from the curriculum documents AC: F-10: Health and Physical Education (ACARA, 2018g), The NZC: Health and Physical Education (NZME, 2014i) and The NZC: Achievement objectives by learning area (2007d), unless otherwise stated.

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 expects that Year 2 students are 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 AC: HPE requires Year 2 students to examine messages to make healthy decisions, be physically active in a variety of ways, and build healthy relationships. It encourages interconnections between physical education and health education and has a focus on building on students' strengths and taking action beyond the self.

The NZC: HPE is underpinned by four concepts (Hauora: a Māori philosophy of wellbeing³⁰, Attitudes and values, The socio-ecological perspective and Health promotion), four learning strands (Personal health and physical development, Movement concepts and motor skills, Relationships with other people and Healthy communities and environments), related achievement objectives and seven key areas of learning (mental health, sexuality education, food and nutrition, body care and physical safety, physical activity, sport studies and outdoor

²⁹ For further information about comparative points in this study see Section 3.2 Comparative study: Method

³⁰ In health and physical education, the use of the word hauora is based on Mason Durie's Te Whare Tapa Whā model (Durie, 1994). Hauora and well-being, though not synonyms, share much common ground. Taha wairua relates to spiritual well-being; taha hinengaro to mental and emotional well-being; taha tinana to physical well-being; and taha whānau to social well-being

education). Three subjects (health education, physical education and home economics) are included within this structure and share conceptual frameworks and achievement objectives. Achievement objectives in NZC: HPE are represented as progressive levels where “individual students or groups of students of the same age could be working towards achieving objectives at different levels within and across the strands” (NZME, 1999, p.13). This is also represented in The NZC (NZME, 2007a, p. 39).

Level 1 and Level 2 of NZC: HPE address achievement objectives that span across the four learning strands. Within both levels, students develop an understanding of personal growth and development, regular physical activity, safety management, personal identity, movement skills, positive attitudes, science and technology, challenges and social and cultural factors, relationships, identity, sensitivity and respect, interpersonal skills, societal attitudes and values, community resources, rights, responsibilities and laws, and people and the environment.

Measurement of Curriculum: Breadth, Depth and Rigour

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

AC – Breadth

Breadth: Comprehensive

For students in Year 2, the expectations of 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 on general capabilities, particularly personal and social capability, critical and creative thinking and ethical understanding, to enhance the curriculum.

NZC – Breadth

Breadth: Comprehensive

For students working in or across Levels 1 and 2, the expectations of NZC: HPE reflect a **comprehensive** level in relation to breadth of coverage. The four concepts of Hauora: wellbeing, attitudes and values, the socio-ecological perspective and health promotion that underpin NZC: HPE introduce students to related concepts of wellbeing, respect, care for self, others and the environment, social justice, interrelationships, physical and emotional environments, and personal and collective action. Across the four learning strands there are 11 achievement objectives in Level 1 and 15 achievement objectives in Level 2 where students learn about health, growth and development, self-care, self-worth, safe practices, identity, movement skills and sequences, games and rules, fair and culturally appropriate

participation for all, relationships, respect, uniqueness, needs and wants, community resources, safe practices and environments and individual and collective action. Students are also expected to develop the five key competencies of thinking, using language, symbols and texts, managing self, relating to others, participating and contributing.

AC – Depth

Depth: Fundamental

The expectations of AC: HPE curriculum 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. 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).

NZC – Depth

Depth: Challenging

The expectations of the Level 1 and Level 2 NZC: HPE reflect a **challenging** level of depth through the integration and connection of knowledge, skills and understandings of the four underlying concepts, four learning strands and their achievement objectives, the seven key areas of learning and the integrated subjects of health education, physical education and home economics. High order thinking skills are evident throughout the achievement objectives and often require students to apply their knowledge in a range of contexts or varied situations/circumstances. Students working in or across Level 1 and Level 2 of NZC: HPE are expected to identify, describe, ask questions, use, develop, explore, express, act, practice, participate, demonstrate, explain and apply concepts of personal growth, wellbeing, movement, relationships, healthy communities and environments and transfer their knowledge to real life situations. In Level 2 students progress to understanding and applying more complex concepts such as self-care, self-worth, fairness, safety, cultural inclusivity, attitudes and values, uniqueness and social health. Students in Level 2 are also expected to justify their thinking and draw connections between health and physical education achievement objectives. For example, in the strand of personal health and physical education, students in Level 2 are required to “experience creative, regular and enjoyable physical activities and describe the benefits to well-being” (NZME, 2007d). Similarly, in the strand of movement concepts and motor skills, students are asked to “participate in and create a variety of games and activities and discuss the enjoyment that these activities can bring to them and others” (NZME, 2007d).

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, indicating a **moderate** degree of rigour in the Year 2 HPE curriculum. The cognitive demand placed on Year 2 students in the HPE curriculum content requires them to develop skills and

understanding through comparing, applying, describing and explaining, supported by the elaborations tied to content. 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' (ACARA, 2018g).

NZC – Rigour

Rigour: Challenging

The terminology and expectations of students working in or across Level 1 and Level 2 of NZC: HPE are considered **challenging**. This is reflected in the structure of NZC: HPE where conceptual-based thinking and learning are placed at the heart of the curriculum, where students and teachers thread the concepts of Hauora, attitudes and values, socio-ecological perspectives and health promotions throughout the four strands, their achievement objectives and seven key areas of learning. Achievement objectives are reflective of the inter-related subjects of health education, physical education and home economics. Complex terminology and cognitive demand terms are evident in achievement objective descriptors.

As students move into Level 2, the cognitive demand and intellectual challenge increase with additional opportunities for students to reason, justify, explain and discuss their thinking and learning of concepts, content knowledge and skills. Rigour is also reflected by the range of cognitive demand terms that increase in complexity in relation to concepts to be explored as students move across Level 1 and Level 2 in NZC: HPE. The cognitive demand extends beyond the recall and reproduction skill sets in the achievement objectives where students are required to make decisions about their learning, justify and explain their understandings and apply their knowledge to a range of personal and social environments. Within Level 2, students are encouraged to apply strategic and reflective thinking skills in achievement objectives. For example, in the movement concepts and motor skills learning strand, the achievement objective states, "participate in and create a variety of games and activities and discuss the enjoyment that these activities can bring to them and others" (NZME, 2007d, p. 13).

Comparative Analysis

The expectations of students working in Years 1 and 2 of AC: HPE compared with students working in or across Level 1 and Level 2 in NZC: HPE demonstrate some commonalities in breadth. However, consideration of depth and rigour indicates that there are differences at these comparison points. Both the AC: HPE and NZC: HPE draw on a critical inquiry approach to equip students with the skills, knowledge and understandings required to enhance their sense of self, others and the world around them through health-related and movement-related concepts and contexts. Both curricula demonstrate alignment in learning areas and learning concepts of health, wellbeing, safety, physical skill development and health messages and have a focus on developing students' health literacy. Despite the differences in the number of learning strands between the two curricula structures, when comparing the breadth of the sub-strands and content within these in AC: HPE with that of the four strands, sub-strands and achievement objectives in NZC: HPE, strong alignment exists. In relation to breadth, NZC: HPE also encompasses four underpinning concepts, the subject of home economics, an expectation that sexuality programs are delivered every two years and

the development of aquatics skills which are mentioned in the learning area statement for teachers but are not explicitly mentioned in achievement objectives of these year levels. The New Zealand and Australian curricula both allow flexibility in the delivery of topics or activities based on student need, context in relation to the achievement standards and content descriptions (AC: HPE) and the achievement objectives (NZC: HPE).

Points of difference exist between the two curricula in relation to depth and rigour. When comparing AC: HPE with NZC: HPE, despite commonalities existing between the body of conceptual knowledge in the content descriptions of NZC: HPE and the achievement objectives of AC: HPE, there are differences in the structure of statements in NZC: HPE that leads students to the development of a deeper understanding of concepts where they are required to apply their understandings to a range of authentic and real-life contexts. For example, in NZC: HPE students working in or across Levels 1 and 2 are expected to “describe and use safe practices in a range of contexts and identify people who can help and identify risk and use safe practices in a range of contexts” (NZME, 2007d). Similarly, there are points of differences between the two curricula in relation to the cognitive demands placed on students. Achievement objective statements in NZC: HPE exhibit a greater range of cognitive demand within one achievement objective. For example, in Level 2 of NZC: HPE, students are expected to “participate in and create a variety of games and activities and discuss the enjoyment that these activities can bring to them and others” (NZME, 2007d). By comparison, students in Years 1 and 2 in AC: HPE are expected to “create and participate in games with or without equipment” (ACARA, 2018m, p.4).

Teacher resource documents also vary across the two curricula. The AC: HPE provides teachers with work samples to support their understanding of Years 1 and 2 achievement standards, whereas NZC: HPE provides extensive supporting documents for teachers in relation to pedagogy, assessment practices, research articles and further reading materials in the curriculum resources section of the NZME website.

Year/Grade Level

Australian Curriculum: Years 5 and 6

New Zealand Curriculum: Levels 3 and Level 4³¹

Learning Area/Subject

Australian Curriculum: Health and Physical Education (AC: HPE)

New Zealand Curriculum: Health and Physical Education (NZC: HPE)

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 relationships changes over time. The curriculum expects students to develop skills and understandings 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. They come to understand how participation in physical activity can enhance health-related fitness and wellbeing across the lifespan and contribute to intercultural understanding. The AC: HPE is distinguished by the expectation that students gain an understanding of the cultural significance of physical activity.

The AC: HPE requires Year 6 students to expand their physical competence, understand personal and social factors that influence wellbeing and apply decision-making and problem-solving skills. It encourages connections between physical education and health education and expects eleven-year-olds to apply their learning to their own lives and those of others. Developing students' health literacy in Year 6 increases at this level with the expectation that students can access, interpret health information to draw conclusions and make healthy choices to benefit themselves and others.

The NZC: HPE is presented through four underlying concepts (Hauora: wellbeing, Attitudes and values, The socio-ecological perspective and Health promotion), four learning strands (Personal health and physical development, Movement concepts and motor skills, Relationships with other people, and Healthy communities and environments) and their achievement objectives and seven key areas of learning (mental health, sexuality education, food and nutrition, body care and physical safety, physical activity, sport studies and outdoor education). Subjects of health education, physical education and home economics are integrated in the structure and share a conceptual framework and achievement objectives in NZC: HPE. Achievement objectives in The NZC are represented as progressive levels where "individual students or groups of students of the same age could be working towards achieving objectives at different levels within and across the strands" (NZME, 1999, p.13). This is also represented in The NZC (NZME, 2007a, p. 39).

Students working in or across Level 3 and 4 of NZC: HPE are introduced to more complex concepts across the four learning strands within achievement objectives, alongside the four concepts and the key competencies of thinking, using language, symbols and texts, managing self, relating to others, participating and contributing.

³¹ For further information about comparative points in this study see Section 3.2 Comparative study: Method

Measurement of Curriculum: Breadth, Depth and Rigour

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

AC – Breadth

Breadth: Comprehensive

For students in Year 6, the expectations of AC: HPE are **comprehensive** in relation to breadth of coverage. The curriculum expects that teachers cover 18 content descriptions and 11 focus areas. This content, supported by 63 elaborations, includes an exhaustive range of health and physical activity topics from understanding physical and social changes to group problem-solving and composition of movement. This content, supported by 63 elaborations, includes a wide 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 described in the achievement standard. The AC: HPE also draws on 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).

NZC – Breadth

Breadth: Comprehensive

For students working in or across Level 3 and Level 4, the expectations of NZC: HPE are **comprehensive** in relation to breadth of coverage. It is implied that the four underlying concepts continue to be explored as a continuation from Level 1 and Level 2. Achievement objectives in Level 3 and Level 4 build on the knowledge, understandings, skills and attitudes from Levels 1 and 2 and increase in complexity in understanding health-related and movement concepts. The key competencies continue to draw connections with elements of NZC: HPE and add to breadth in this area. The curriculum progresses in breadth with a comprehensive coverage of concepts across Levels 3 and 4 with 15 achievement objectives in Level 3 and 14 achievement objectives in Level 4 that increases in student responsibility and ownership of learning. Sexuality education programs are expected to be delivered once every two years. By the end of year 6, all students are expected to have had opportunities to learn basic aquatic skills.

AC – Depth

Depth: Challenging

The expectations of 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 HPE sub-strands requires cognitive effort to transfer thinking and learning from one context to another.

NZC – Depth

Depth: Challenging

The expectations of NZC: HPE for students working in or across Level 3 and Level 4 are considered **challenging**. The depth to which learners may extend their knowledge to gain a deeper understanding of key concepts and principles is reflected through the achievement objective statements in Level 3 and Level 4. Students continue to learn that wellbeing is an integration of the physical, mental, emotional, social and spiritual parts of life through the four conceptual strands and their related sets of achievement objectives. An increasing sense of responsibility, respect and positive action is expected of students as they learn in and across Level 3 and Level 4 to identify and describe factors that affect their health and wellbeing. In Level 3 and 4, students are expected to take individual and collective action to affect personal, physical, social and emotional growth and wellbeing. Increasing detail builds within all four strands, integrating more elements of the four key concepts, the key areas of learning and the different but related subjects of health education, physical education and home economics.

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, indicating a **moderate** degree of rigour. The cognitive demand placed on Year 6 students in 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.

NZC – Rigour

Rigour: Challenging

The terminology and expectations of students working in or across Level 3 and Level 4, expressed through the key concepts, strands, sub-strands and achievement objectives of NZC: HPE indicate a **challenging** level of rigour. The cognitive demand extends beyond the recall and reproduction skill sets in the achievement objectives where students are required to make decisions about their learning, justify and explain their understandings and apply their knowledge to a range of situations, environments and settings. The NZC: HPE in Level 3 and Level 4 requires students to identify, describe, recognise, research, investigate, evaluate, specify, plan and implement and take individual and collective action. The knowledge that builds across Level 3 to Level 4 extends students' thinking where they are expected to justify choices, plans and actions, and transfer knowledge from the interrelated strands, concepts, subjects and key competencies within NZC: HPE.

Comparative Analysis

The AC: HPE and NZC: HPE provide comparable breadth of conceptual content and depth at this comparison point. However, evidence from the four underlying concepts of NZC: HPE and achievement objectives suggest that there is greater rigour expected of students working in Level 3 and Level 4 of NZC: HPE.

Both curricula focus on students investigating the influences on their own and others health, safety, wellbeing and physical development. Despite AC: HPE having two learning strands and NZC: HPE having four learning strands, there is strong alignment in breadth of learning for students working in Years 5 and 6 of AC: HPE and students working in or across Level and/or Level 4 of NZC: HPE. For example, NZC: HPE expects students to describe factors that affect their personal, physical and emotional growth, such as pubertal changes, and develop skills to manage changes including adjustment strategies. Similarly, AC: HPE expects students to investigate resources and strategies to manage changes and transitions associated with puberty (ACPPSO52). Both curricula focus on increasing student responsibility to participate in and maintain regular physical activity and develop an understanding of how social and cultural practices are expressed through movement. The NZC: HPE expects students to identify how people discriminate, recognise instances of discrimination and act responsibly to support the rights and feelings of themselves and others, whereas AC: HPE asks students to “identify how valuing diversity positively influences the wellbeing of the community” (ACARA, 2018g).

Despite both curricula providing flexibility of content choices by teachers, NZC: HPE in Level 3 and Level 4 is more explicit in the guidance detailed in the achievement objectives in comparison with AC: HPE content descriptions. Overall, AC: HPE provides slightly more flexibility to account for shifting patterns of influences, needs, interests and priorities in health and physical activity, whereas NZC: HPE explicitly suggests related concepts, strategies and activities within the conceptual framework, such as self-worth, co-operative and competitive activities, health and safety guidelines, discrimination, and individual and collective action. In comparison with what students are expected to learn in Years 5 and 6 of AC: HPE, this is evident throughout the focus area information for AC: HPE but not explicit in the content descriptions. While additional details are also included in the elaborations of AC: HPE, as these are not mandatory, they have not been considered when comparing the breadth and depth.

Some points of difference are apparent between the two curricula in relation to measuring rigour. While both curricula provide opportunity for extended thinking, on balance, these opportunities are more prominent in NZC: HPE in relation to the depth of understanding of concepts, interconnectedness of knowledge between key concepts and the cognitive demand placed on students learning in Level 3 and Level 4 within achievement objectives. The AC: HPE expects students to examine, investigate, plan, practise, recognise, explore, identify, propose, apply, manipulate and modify, participate and demonstrate. In comparison, NZC: HPE expects students to identify, develop, describe, discuss, demonstrate, maintain, access and use, extend, participate, experience, compare, access, research, investigate, plan and implement, specify and take action. The underpinning of the key concepts in NZC: HPE also add to the challenging level of rigour expected of student learning in Level 3 and Level 4.

Year/Grade Level

Australian Curriculum: Years 9 and 10

New Zealand Curriculum: Levels 5 and 6³²

Learning Area/Subject

Australian Curriculum: Health and Physical Education (AC: HPE)

New Zealand Curriculum: Health and Physical Education NZC: HPE)

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 asks Year 10 students to analyse how participation in physical activity and sport influences individual identity and explore the role participation plays in shaping cultures.

The AC: HPE expects students to develop a holistic understanding of health and access, and synthesise and apply, health information from credible sources to make responsible and informed health-related decisions. It encourages connections between physical education and health education.

The NZC: HPE is articulated through four underlying concepts (Hauora: wellbeing, attitudes and values, the socio-ecological perspective and health promotion), four learning strands (personal health and physical development, movement concepts and motor skills, relationships with other people and Healthy communities and environments) and seven key areas of learning (mental health, sexuality education, food and nutrition, body care and physical safety, physical activity, sport studies and outdoor education). Subjects of health education, physical education and home economics are integrated in the structure and share a conceptual framework and achievement objectives in NZC: HPE.

Achievement objectives in The NZC are represented as eight progressive levels where "individual students or groups of students of the same age could be working towards achieving objectives at different levels within and across the strands" (NZME, 1999, p.13). Therefore, students working in Level 5 and/or Level 6 could be representative of learners completing their final year of compulsory schooling in Year 10 or beginning their first year of senior secondary schooling in Year 11. Despite this difference, the achievement objectives for Levels 5 and 6 in NZC: HPE remain the same. Differences occur with supporting teacher documentation that is available on the NZME Senior Secondary website that includes additional information and resources regarding key concepts in health education, physical education and home economics in Level 6.

The NZC: HPE Level 5 expects students to think critically, be reflective, take action and analyse and apply knowledge to make meaning of the world around them by inquiring into health-related and movement contexts. Senior secondary advice provides further guidance

³² For further information about comparative points in this study see Section 3.2 Comparative study: Method

about what students learn in the subjects of health education, physical education and home economics. For example, the physical education aspect in Level 6 aims to promote active lifestyles, challenge thinking in a fun environment, build movement competence and confidence, develop teamwork, leadership and interpersonal skills, explore and develop decision-making and risk-management, trigger thinking and action to create change, and develop understandings about the social and cultural significance of movement. The home economics specialisation aims to increase and drive academic and applied knowledge, develop food preparation skills, trigger thinking and action to create change, and create learning pathways for future studies.

Measurement of Curriculum: Breadth, Depth and Rigour

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

AC – Breadth

Breadth: Comprehensive

For students in Year 10, breadth of content coverage in 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 a wide 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 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.

NZC – Breadth

Breadth: Comprehensive

For students working in or across Level 5 and Level 6, breadth of content coverage in NZC: HPE is assessed as **comprehensive**. The curriculum expects teachers to address 15 achievement objectives in Level 5 and 15 achievement objectives in Level 6. This content is supported by the four underlying concepts of Hauora, Attitudes and values, Socio-ecological perspective and Health promotion. Key concepts in health education, physical education and home economics are noted on the NZME Senior Secondary website along with achievement objectives for Level 6 in the subjects of health education, physical education and home economics. There is an implicit expectation that students are expected to develop this knowledge alongside the five key competencies of thinking, using language, symbols and texts, managing self, relating to others and participating and contributing.

AC – Depth

Depth: Challenging

Based on consideration of content coverage, the expectations of AC: HPE are deemed to be **challenging**. Students are expected to use strategic and extended thinking, 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 and students are expected to transfer learning between physical and health-related issues.

NZC – Depth

Depth: Challenging

On balance, the expectations of NZC: HPE Level 5 and Level 6 achievement objectives in relation to depth are **challenging**. Students are expected to investigate and explain the interconnectedness of health and well-being concepts for the benefits of themselves, others and society and compare, contrast and analyse societal influences, community services, values and practices that affect societal safety and well-being. As students progress from Level 5 to Level 6, increasing responsibility is placed on students to identify the connections within and across learning strands, concepts and competencies through authentic situations and environments.

AC – Rigour

Rigour: Challenging

The terminology and expectations of 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 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 AC: HPE uses language such as ‘critically analyse’, ‘synthesise’, ‘justify’, ‘design’ and ‘refine’.

NZC – Rigour

Rigour: Challenging

The terminology and expectations of NZC: HPE underlying concepts and achievement objectives in Level 5 and Level 6 indicate a **challenging** degree of rigour. Increased cognitive demand is placed on students to acquire, apply and transfer knowledge across the four interrelated strands. Achievement objectives demand complex thinking to plan, investigate, evaluate, analyse, advocate, compare and contrast findings. In Level 6, students are expected to broaden their knowledge and investigate the effectiveness of local, national and international healthy and safe services and resources that promote well-being. Increasing emphasis is placed on students in Level 6 to focus on the aspects of the concept hauora, how the dimensions of this concept interconnect, and apply this understanding to a range of

situations and contexts.

Comparative Analysis

The aims of both AC: HPE and NZC: HPE curricular demonstrate strong similarities with intent and purpose such as that students:

- develop well-being for themselves, others and the wider community
- explore health related and movement concepts
- take action to contribute to healthy communities
- develop specialised movement skills to enable them to participate in lifelong physical activity
- develop critical inquiry skills to identify, access, explore, evaluate and synthesise health information.

Both the AC: HPE and NZC: HPE curricular are comparable in requiring students to develop a holistic understanding of health and access, and synthesise and apply health information from credible sources to make responsible and informed health-related decisions. Both curricula encourage interdisciplinary links between physical education and health education and expect students to apply their knowledge in various contexts, maintain ongoing involvement in physical activities and refine specialised movement skills. In both curricula, emphasis is placed on students to critically analyse contextual factors that influence identities, relationships and well-being, analyse, evaluate and justify responses to health investigations and propose strategies and interventions to make healthy and safe choices.

In both the AC: HPE and NZC: HPE, students are expected to acquire, apply and refine movement skills and examine techniques and strategies to overcome challenging movement situations. In NZC: HPE students are required to apply scientific and technological knowledge and resources to improve physical capabilities. Decision-making and problem-solving skills are evident throughout both curricula and students are expected to take action to enhance their own and others' health, safety and wellbeing.

A notable difference between the two curricular is an increased focus on students in NZC: HPE applying their understanding of the interrelated concepts of hauora, attitudes and values, socio-ecological perspective and health promotion on which the subjects of health education, physical education and home economics in NZC: HPE subjects are established. The AC: HPE does not require students to develop an understanding of specific big ideas or concepts. Instead there are many concepts embedded within the content descriptions, achievement standards and focus areas.

h) Learning area: Languages

Comparative Curricula

Australian Curriculum

Version 8.3, 2016

New Zealand Curriculum

2007

Year/Grade Level

Australian Curriculum: Year 6 (F-10 sequence)

New Zealand Curriculum: Levels 3 and 4³³

Learning Area/Subject

Australian Curriculum: Languages (AC: L), Japanese F-10 sequence

New Zealand Curriculum: Learning Languages (NZC: LL), Japanese

This section is a comparative study of the AC: Languages and The NZC: Learning Languages. All references in this section are sourced from the curriculum documents AC: F-10: Languages (ACARA, 2018h), The NZC: Learning Languages (NZME, 2014j) and The NZC: Achievement objectives by learning area (2007d), unless otherwise stated.

Expectations: Knowledge and Skills

The AC: L includes fourteen foreign language-specific curricula and two frameworks - a Framework for Aboriginal Languages and Torres Strait Islander Languages and a Framework for Classical Languages with language-specific curricula for Classical Greek and Latin. The curriculum content and achievement standards differ for each language because of inherent differences in the languages themselves, but the over-arching structure is the same.

Each language specific curriculum provides the nature and scope of the content of language learning as well as its own distinctive systems, conventions for use, culture(s), place in the Australian and international communities, and its historical context in Australian education.

The AC: L comprises two sequences of learning, one from Foundation to Year 10 and one from Years 7 to 10. First, second, and background learner pathways have been developed in some languages, designed for language learners who possess varying levels of knowledge and skills. These pathways are in Chinese, Auslan and in the Framework for Aboriginal Languages and Torres Strait Islander Languages. Notably, the latter framework also has a Language Revival Learner Pathway (ACARA, 2018h; ACARA, 2018n).

The curriculum for all languages and frameworks is structured around the two interrelated strands of Communicating and Understanding. The sub-strands of socialising, informing, creating, translating, reflecting, systems of language, language variation and change, and role of language and culture are present in both sequences and all pathways. In AC: L, learning is described in bands of years (F-2, 3-4, 5-6, 7-8, 9-10, and 7-8 and 9-10 for the Year 7 Entry).

The AC: L consists of Content Descriptions, Elaborations and Achievement Standards in all language subjects. The general capabilities (Literacy, Numeracy, Information and Communication Technology (ICT) Capability, Critical and Creative Thinking, Personal and social capability, Ethical Understanding and Intercultural Understanding) and the cross-

³³ For further information about comparative points in this study see Section 3.2 Comparative study: Method

curriculum priorities (Aboriginal and Torres Strait Islander Histories and Cultures, Asia and Australia's Engagement with Asia and Sustainability) are embedded in the Content Descriptions of the curriculum.

For the purposes of this study, the comparison at AC Year 2 has not been made due to the differences in structure and sequencing of the Languages curricula in the two countries' documents. Any comparison at this point would be invalid. Japanese has been selected for specific comparison.

AC: Languages, Japanese

Learning in AC: L at Year 6 builds on the concepts, skills and processes developed in earlier years. It focuses on language learning as conceptual rather than descriptive, meaning that students not only acquire the language and know how to use it, but engage in intercultural comparisons and reflection.

Students in Year 6 are expected to use Japanese for a range of purposes in the classroom, for example, asking and responding to questions, exchanging information, expressing ideas and feelings, performing, responding to learning experiences, and interacting with Japanese language resources. They are expected to interact in a range of situations/purposes, engage with an increasing range of oral, written and multimodal texts and develop their intercultural capability with teacher support and scaffolds. They build on earlier skills and knowledge acquired in the 3-4 band to develop greater fluency and accuracy in pronunciation and communication.

At the end of Year 6, students have completed seven years of study of Japanese as a second language.

NZC: Learning Languages

The NZC: LL is a generic framework for teaching and learning languages in English-medium schools. There are no separate language-specific curricula. However, The NZME published a *Learning Languages Curriculum Guide* to be used alongside the Learning Languages framework for Chinese, French, German and Japanese. Each pair of levels is guided by a Proficiency descriptor which is based on the Common European Framework of Reference for Languages: Learning, Teaching, Assessment. This framework provides a common basis for the elaboration of language syllabuses and curriculum and assessment guidelines (Council of Europe, 2001). A national strategy proposal to strengthen languages education in Aotearoa New Zealand schools from 2019 – 2033 was published in 2018 and included proposed changes in education and language policy (Auckland Languages Strategy Working Group, 2018).

The NZC: LL is presented in bands of levels (1-2, 3-4, 5-6, 7-8) and can be approximately mapped to all years at school. Level 1 is the entry level for those with no prior knowledge of the language being learned. Students engaged in second language learning are unlikely to follow the suggested progression from Level 1 to Level 8 if they begin language study later in their education. Level 1 is the entry point for second language learning regardless of school year level (NZME, 2014j).

The NZC: LL is structured around three interrelated strands of *Communication*, *Language Knowledge* and *Cultural Knowledge*. Strands are further broken down into three generic achievement objectives: *Selecting and using language, symbols and texts to communicate*, *managing self and relating to others*, and *Participating and contributing to communities*. Content is specified in terms of a general proficiency statement for each progressive pair of levels, together with the Achievement objectives for the core strand and two supporting strands. Achievement objectives in the communication strand provide the basis for assessment and the two supporting strands are only assessed indirectly through their contribution to the communication strand.

The NZME *Learning Languages Curriculum Guides* provide language specific curricula and examples of texts that could be used at particular levels, and an analysis of texts in terms of how they enable learners to address the achievement objectives. In the *Learning Languages Curriculum Guide: Japanese*, each achievement objective provides elaborations as examples of how the content might be interpreted in the Japanese teaching and learning programs.

In Levels 3-4 students are expected to understand and construct simple texts in Japanese and describe aspects of their own background and immediate environment (adapted from *Common European Framework for Languages*, Global Scale Level A1: Basic User; Council of Europe, 2001). They understand and produce information and ideas, express and respond to personal needs and interests, use cultural knowledge to communicate, recognise and describe ways in which Japanese is organised, compare and contrast languages, recognise and describe ways in which Japanese culture is organised and compare and contrast cultural practices (NZME, 2007d). There is an emphasis on communication and building the necessary skills and dispositions to make meaning and effectively communicate, draw comparisons between their own language and culture, and understand the structure of the language. Achievement objectives capture broad language concepts and skills. For example, “understand and produce information and ideas” could encompass a wide range of text types, knowledge and concepts and the concept could be explored to varying degrees of complexity.

Measurement of Curriculum: Breadth, Depth and Rigour

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

AC – Breadth

Breadth: Comprehensive

For students in Year 6, the expectations of AC: L are considered **comprehensive** in terms of content coverage. Within the *Communication* and *Understanding* strands, each sub-strand includes threads of content descriptions (CDs), each of which provides elaborations as examples of how the content might be interpreted in the classroom. Also included in content are key concepts and key processes, and text types in the *creating* sub-strand. The

elaborations, key concepts (KC), key processes (KP) and text types vary considerably in nature and number in each of the sequences, see Table 3.38.

Learning the language to communicate with others and learning how language works as a system are integrated with understanding the cultural context of language. Students are expected to develop their knowledge and skills in the language through appropriate topics that begin with the local and familiar (family, friends, home, routine, lifestyle) and expand to broader concepts and contexts (society, environment, wellbeing, fact, giving reasons, drawing conclusions, opinion).

Table 3. 38 *Strands: F-10 Languages, AC, Year 6*

Communicating	Year 6 (F-10)			
	CDs	Elaborations	KCs	KPs
Sub-strand				
Socialising	3	16	10	14
Informing	2	8	4	6
Creating	2	7	5 and five text types	5
Translating	2	6	4	3
Reflecting	2	6	2	4
Total	12	48	28	27

Understanding	Year 6 (F-10)			
	CDs	Elaborations	KCs	KPs
Sub-strand				
Systems of language	3	17	13	18
Language variation and change	2	7	8	6
Role of language and culture	1	6	5	4
Total	6	30	26	28

NZC – Breadth

Breadth: Fundamental

For students in Year 6, the expectations of NZC: LL Levels 3 and 4 are considered **fundamental** in terms of breadth of coverage. Due to the nature of the generic framework, there is limited specificity of the number of topics or content to be covered in the curriculum. However, it does develop and expand knowledge and skills and is flexible to suit a range of contexts and learning environments.

The NZC: LL content and skills build on previous levels and follow the same generic structures to ensure a developmental sequence of learning is articulated. It has an overarching proficiency statement, five key competencies (as for all learning areas), three interrelated strands and seven achievement objectives. In the Japanese curriculum guide, these achievement objectives are further explicated with contextualised examples of

suggested content and skills. For example, the achievement objective: ‘recognise and describe ways in which the target language is organised’ is explicated with “use some kanji and reflect on use of particles”.

These examples in the curriculum guide are similar to AC: L elaborations and provide examples of how students may demonstrate evidence of learning against the achievement objectives. The achievement objectives represent broad interconnected components and the macro skills essential to language acquisition: reading, writing, listening, speaking, interacting, and knowledge of grammar and intercultural understanding. Specific content is implied through generic skills and concepts that could, potentially, be expanded upon. As in AC: L, NZC: LL Levels 4 and 5 integrate culture and cultural practices with language learning. The AC: L highlights this intercultural orientation. The NZC: LL has scope to compare and contrast language and cultural practices.

Table 3. 39 NZC: LL Proficiency descriptor and strands

Proficiency descriptor	Students can understand and construct simple texts using their knowledge of the target language. Students can describe aspects of their own background and immediate environment.	1
Strand (3)	Achievement objectives	
Communicating	Selecting and using language, symbols and texts to communicate: Understand and produce information and ideas	1
	Managing self and relating to others: Express and respond to personal needs interests	1
	Participating and contributing to communities: Use cultural knowledge to communicate appropriately	1
Support strand: Language knowledge	Recognise and describe ways in which the target language is organised Compare and contrast languages	2
Support strand: Cultural Knowledge	Recognise and describe ways in which the target culture(s) are organised compare and contrast cultural practices	2
Total	7	7

AC – Depth

Breadth: Challenging

The expectations of AC: L, Japanese Year 6 (F-10) are deemed to be **challenging**, based on the expectations of the scope and depth of skills and knowledge developed. The focus is on building interactional skills, maintaining and contributing to conversations, and expressing ideas, points of view and preferences using appropriate language for a range of purposes. Learners engage with, and create, a variety of texts such as emails, blogs and dialogues and reflect on the use of language. Learners manipulate the language appropriately in unfamiliar contexts. They recognise verbal and non-verbal cues and increase their range of Japanese vocabulary, grammar and tenses, and use adverbs, adjectives, and prepositions to create more complex sentences. Students are expected to become more independent but with support from teacher scaffolding and modelling. They are expected to demonstrate a deeper understanding of the differences and similarities in the cultural practices of Japanese and Australians.

Students are also expected to ‘use higher-order skills and deep thinking to interpret and explain’ (ACLJAC152), ‘reflect’ (ACLJAC154), ‘analyse and compare’ (ACLJAC155) and ‘discriminate’ (ACLJAU156). They are expected to ‘understand various ways of using Japanese language depending on context and relationship’ (ACLJAU160) and ‘recognise external influences on language’ (ACLJAU161) and ‘make connections between cultural practices and language use’ (ACLJAU162).

NZC – Depth

Depth: Fundamental

The expectations of NZC: LL Levels 3 and 4 are deemed to be **fundamental**, based on the expected skills and knowledge described. The NZC: LL proficiency descriptor is based on the *Common European Framework for Languages* and provides suggested skills and understandings for the pair of levels. The descriptor is concise and does not provide details about content that could lead to the development of deep understandings of key concepts, principles and knowledge. Instead, it is flexible and allows schools to adapt the framework to their context and language. The Achievement objectives for Levels 3 and 4 are limited to seven generic points associated with language-learning knowledge, skills, understanding and experiences.

The fundamental ideas and principles of second language learning are outlined in the proficiency descriptor and achievement objectives. However, there are no in-depth content descriptors or elaborations to suggest how higher-order thinking or inquiry skills may be developed. The depth of coverage is left to the teachers’ and schools’ interpretation and implementation of the curriculum and development of appropriate pedagogy and language teaching methodology for context. Students are expected to understand, produce, express, respond, use, show, recognise, describe, compare, contrast (achievement objectives) but there is no explicit direction or guidance to incorporate skills such as analysing, evaluating, reflecting, differentiating, problem-solving, justifying or discriminating. Due to the generic and flexible nature of the framework, there is scope for teachers and schools to adjust planning and instruction to meet the needs of their students’ language background and cognitive capabilities.

AC – Rigour

Rigour: Challenging

The AC: L, Japanese, Year 6 content develops skills and understanding through a range of key processes: comparing, connecting, corresponding, creating, exchanging, explaining, identifying, informing, interpreting, making decisions, modifying, participating, performing, planning, recognising, reflecting, researching, reviewing, selecting, sharing, synthesising, understanding, taking action, transacting, translating. 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. The elaborations give clear direction to teachers on how to provide learning experiences that are challenging and allow students to engage with Japanese language in a variety of contexts and for a range of audiences and purposes.

For Year 6 students, this is the seventh year of learning Japanese, and the AC recognises that students build on language learning strategies and intercultural awareness. Students' textual knowledge developed through English literacy learning also supports further development of literacy in Japanese, for example in students "expanding their social networks, experiences and communicative repertoires both in their first language and Japanese". There is an expectation that students will "develop skills of reflecting, reading language for cultural and contextual meaning, selecting appropriate language and creating texts to engage particular audiences, develop metalanguage to describe rules and variations in language structures and consider how language features and expressions reflect cultural and experiences" (ACARA: Years 5 and 6 Band Descriptions).

The elaborations provide suggestions that encourage multiple approaches, strategies and solutions to help facilitate students' deeper and broader engagement with learning Japanese. They also focus on language learning as conceptual rather than descriptive, meaning that students will not only acquire the language and know how to use it, but also engage in intercultural comparisons and reflection, supporting the determination of challenging in terms of rigour.

NZC – Rigour

Rigour: Moderate

The NZC: LL Levels 3 and 4 develop skills and knowledge expounded in a key proficiency statement and seven achievement objectives, which indicate a **moderate** degree of rigour. In the Japanese curriculum guide the achievement objectives are further unpacked and examples of what students may be able to understand and do are provided. The achievement objectives are skill and knowledge-based and require students to understand and produce information, express and respond, use cultural knowledge, recognise and describe, and compare and contrast. There is no explicit mention of students at Levels 3 and 4 being expected to critically analyse, evaluate or reflect on the dynamic nature of second language learning and culture, or make connections between cultural practices and values and language use, or consider how these affect intercultural communication. However, based on assessment and pedagogical advice given in The NZC guide for English-medium teaching and learning, NZC: LL has the flexibility to allow for rigorous exploration of concepts and differentiated movement between levels.

The content is presented as a framework with no language-specific content, and skills are generic. The Japanese curriculum guide does not provide detail regarding linguistic elements or understanding and ideas of how students may demonstrate knowledge and skills in relation to the achievement objectives. There is limited information and guidance regarding the level of cognitive demand for students to accomplish tasks or how students demonstrate depth of understanding of the content. Acquisition of skills is not aligned to the achievement objectives or overall proficiency statement.

Comparative Analysis

The NZC: LL and AC: L share a similar rationale and detail of the benefits of language learning, as well as the essential skills and knowledge students need to acquire. The critical role of languages and cultures in the development of personal, group, national and human identities is emphasised in both curricula.

The AC: L explains “Language learning provides the opportunity for students to engage with the linguistic and cultural diversity of the world and its peoples, to reflect on their understanding of experience in various aspects of social life, and on their own participation and ways of being in the world. Learning languages broadens students’ horizons in relation to the personal, social, cultural and employment opportunities that an increasingly interconnected and interdependent world presents” (ACARA, 2018h).

The NZC: LL echoes these words in their statements that “Languages link people locally and globally. They are spoken in the community, used internationally, and play a role in shaping the world. Oral, written, and visual forms of language link us to the past and give us access to new and different streams of thought and to beliefs and cultural practices. By learning an additional language and its related culture(s), students come to appreciate that languages and cultures are systems that are organised and used in particular ways to achieve meaning. Learning a new language extends students’ linguistic and cultural understanding and their ability to interact appropriately with other speakers” (NZME, 2007d).

The NZC: LL framework is for the teaching and learning of languages that are additional to the language of instruction. Level 1 of the curriculum is the entry level for students with no prior knowledge of the language being learned, regardless of their year of schooling. In contrast, AC: L has two different sequences (F to 10 and Years 7 to 10) with content and achievement expected at the corresponding band of years.

In NZC: LL there is limited explicit consideration of differences among second language learners, background language learners or first language learners with one sequence, and one entry point regardless of year of schooling. However, the broad nature of the framework allows for flexibility and differentiation for teachers and schools to adjust planning and instruction to meet the needs of their students and their cognitive capabilities.

Content in NZC: LL is stated implicitly to cater for a range of languages and levels. Based on assessment and pedagogical advice given in NZC: LL, it has the flexibility to allow for rigorous exploration of concepts and differentiated movement between levels through an inquiry approach.

Both the AC: L, Japanese and NZC: LL are designed to equip students with the knowledge, skills and understanding to effectively use a second language to communicate and develop an appreciation and awareness of the target culture(s). The AC: L, Japanese is prescriptive

and detailed, yet still provides a level of flexibility regarding content (elaborations provide language ideas and examples of the sub-strands in context).

In both the AC: L and NZC: LL year levels are grouped together into bands or levels; F-2 and Levels 1-2. In both curricula there is a level of achievement based on either an achievement standard or proficiency descriptor with achievement objectives. In AC: L, Japanese there is alignment between the aims of the curriculum, the content descriptors (skills, knowledge and understanding) and the achievement standards (outcomes). The NZC: LL is presented in pairs of levels and the framework is a generic document in order to encompass all languages that may be offered in schools. It is flexible and non-prescriptive to allow teachers and students to pursue areas of interest and relevance to their educational context. The generic Learning Languages framework gives direction and provides examples for teachers in English-medium schools. However, there are no set achievement standards, prescribed content descriptors or supporting elaborations. Both the AC: L and NZL: LL incorporate strands and sub-strands, and achievement objectives. In AC: L content descriptions in each of the three strands are grouped into sub-strands that, across the year levels, present a developmental sequence of knowledge, understanding and skills. The achievement objectives in NZC: LL detail what students are expected to be able to do and understand, similar to AC: L content descriptors.

In NZC: LL, individual schools are expected to develop their own language-specific curricula based on NZC: LL framework and utilise a curriculum guide for further task examples and programming advice. Therefore, it can be concluded that depth, breadth and rigour are closely linked to pedagogy and implementation/programming in individual schools.

Year/Grade Level

Australian Curriculum: Year 10 (F-10 sequence)

New Zealand Curriculum: Levels 5 and 6³⁴

Learning Area/Subject

Australian Curriculum: Languages (AC: L)

New Zealand Curriculum: Learning Languages (NZC: LL)

Expectations: Knowledge and Skills

The AC: L Japanese is pitched for the majority of the cohort of learners of Japanese, those for whom Japanese is an additional language (referred to in the AC as a second language learner). The curriculum has been developed for two learning sequences, a Foundation to Year 10 Sequence and a Years 7 to 10 (Year 7 Entry) Sequence.

At Year 10 level students of Japanese 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 Japanese language is integrated with a growing appreciation of the cultural context of the language, the communities in which Japanese is spoken and their place in the world. Building on skills acquired from Foundation to Year 10, learners acquire a range of strategies that can be applied to communicate effectively, knowledge of systems of language and conventions of use, and begin to understand the relationship between language and culture. Year 10

³⁴ For further information about comparative points in this study see Section 3.2 Comparative study: Method

students of Japanese continue to develop proficiency in the skills essential to listening, speaking, reading, writing and interacting in a second language. Students develop their skills and knowledge within appropriate topics, using a range of texts. The AC: L expects Year 10 students of Japanese to learn to interpret, create, evaluate and analyse a range of genres. The general capabilities are carried across from F-6 to 7-10.

The NZC: LL framework is structured around three interrelated strands of Communication, Language knowledge and cultural knowledge. Strands are further broken down into three generic achievement objectives: *Selecting and using language, symbols and texts to communicate, Managing self and relating to others, and Participating and contributing to communities*. Achievement objectives are based on five key competencies which span across all learning areas: thinking, using language, symbols and texts, managing self, relating to others and participating and contributing. The content of the learning area is specified in terms of a general proficiency statement for each progressive pair of levels, together with the Achievement objectives for the core strand and two supporting strands. Achievement objectives in the communication strand provide the basis for assessment and the two supporting strands are only assessed in directly through their contribution to the communication strand. Notably, there is only one sequence of learning and no alternative first, second, and background learner pathways in NZC: LL framework.

Level 1 is the entry level for those with no prior knowledge of the language being learned. Students engaging in second language learning are unlikely to follow the suggested progression if they begin language study later in their education as Level 1 is the entry point for second language learning regardless of year level (NZME, 2014j). Potentially students commencing language study in Year 8 in New Zealand will be starting from Level 1, the same as Foundation students. The proficiency descriptor and achievement objectives at Levels 1 and 2 are broad and flexible enough to be adapted to suit and year level.

At Year 10 (Levels 5 and 6), NZME has not published a *Learning Languages Curriculum Guide* for Japanese. Therefore, there is no guidance in terms of language-specific curricula or examples of texts that could be used at a specific level. Only three of the achievement objectives in Levels 5 and 6 have elaborations as examples of how the content might be interpreted in the Japanese teaching context.

Measurement of Curriculum: Breadth, Depth and Rigour

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

AC – Breadth

Breadth: Comprehensive

For students in Year 10, the expectations of AC: L, Japanese 10 (F-10) are **comprehensive** in relation to breadth of coverage. As denoted in Table 3.40, AC: L comprises two inter-related strands *Communicating* and *Understanding*, each with sub-strands and a total of 19

content descriptions (CDs). The content focuses on the skills of communicating in Japanese, and an understanding of the systems of the language, conventions of its use and the culture of the Japanese language and Japanese 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 ideas that developing the knowledge, understanding and skills to communicate effectively and the awareness of the relationship of language and culture shape learning. Students are expected to demonstrate proficiency in the skills and content as described in the achievement standard.

Table 3. 40 *Communicating and Understanding Strands in AC, Year 10 F-10 sequence*

Communicating	Year 10 (F-10)			
Sub-strand	CDs	Elaborations	KCs	KPs
Socialising	3	14	10	11
Informing	2	11	6	8
Creating	2	9	8 and six text types	10
Translating	2	8	5	9
Reflecting	2	8	5	8
Total	11	49	34	46

Understanding	Year 10 (F-10)			
Sub-strand	CDs	Elaborations	KCs	KPs
Systems of language	4	30		
Language variation and change	2	8		
Role of language and culture	1	5		
Total	7	43		

NZC – Breadth

Breadth: Fundamental

For students in Year 10, the expectations of NZC: LL Levels 5 and 6 are considered **fundamental** in terms of breadth of coverage. Due to the nature of the generic framework, the scope and range in terms, topics and content to be covered in the curriculum is not available. However, it builds on and expands knowledge and skills from previous levels and is flexible to suit a range of contexts and learning environments.

The NZC: LL content and skills builds on previous levels and follows the same generic structures to ensure a developmental sequence of learning is articulated. It has an overarching proficiency statement, five key competencies (same for all learning areas), three interrelated strands and five achievement objectives (two less than Levels 3 and 4). In Levels 1 – 4 of NZC: LL Language specific curriculum guides exist. However, Levels 5 and 6 do not have a guide. This impacts the breadth of coverage. However, it is still fundamental in terms of the knowledge and skills required at these levels and implicit in nature to encompass a range of contexts and learners.

The achievement objectives represent interconnected components and macro skills essential to language acquisition: reading, writing, listening, speaking, interacting, knowledge of grammar and intercultural understanding. Specific content is implied through general skills and concepts that could be expanded upon. As with AC: L, in NZC: LL Levels 5 and 6, the idea that culture and cultural practices are closely connected with language learning underpins the approach to second language learning. The AC: L highlights this intercultural orientation on a deeper, more meaningful level requiring students to reflect, question, analyse and synthesise. However, NZC: LL Levels 5 and 6 expects students to understand ways in which language and culture are organised for different purposes. For this reason, NZC: LL Levels 5 and 6 cannot be deemed limited in terms of breadth.

Table 3. 41 NZC: LL Proficiency descriptor and strands

Proficiency descriptor	Students can understand and produce more complex language. They can communicate beyond the immediate context, for example, past and future events. Students can understand and produce a variety of text types.	1
Strand (3)	Achievement objectives	
Communicating	Selecting and using language, symbols and texts to communicate: Communicate information, ideas and opinions through different text types	1
	Managing self and relating to others: Express and respond to personal ideas and opinions	1
	Participating and contributing to communities: Communicate appropriately in different situations	1
Support strand: Language knowledge	Understand ways in which the target language is organised for different purposes	1
Support strand: Cultural Knowledge	Understand ways in which the target cultures are organised for different purposes	1
Total	5	5

AC – Depth

Depth: Challenging

The expectations of AC: L, Japanese Year 10 (F-10) are **challenging** in relation to depth of coverage of topics, skills and knowledge. The content descriptions in the AC 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 *analysing, discussing, debating, explaining, evaluating, interpreting, negotiating, persuading, questioning, reflecting, reviewing* and *summarising*. Depth of understanding and sophistication of knowledge and skills are also evident in the AC achievement standards where students demonstrate they are able to “discuss topics such as education, work, the environment and youth issues as well as concepts from a range of learning areas”, “compare and evaluate ideas across languages and cultures”, “defend interpretations of texts and diverse points of view, and elaborate, clarify and qualify ideas using supporting evidence and argument” and “reflect on their own and others’ use of language, the language choices made, and the cultural assumptions or understandings which shape them and analyse how culture affects communication” (ACARA, 2018h).

NZC – Depth

Depth: Fundamental

The expectations of NZC: LL, Japanese are **fundamental** in relation to depth of coverage of topics, skills and knowledge. In Levels 3 and 4 students are expected to recognise, compare, contrast, describe, express ideas, and understand. However, in Levels 5 and 6 the achievement objectives primarily contain the verb ‘understand’ in terms of demonstrating what students know and can do. It is clear from the developmental sequence in the generic framework that ‘understand’ is being used broadly and that it intends to extend students as far as possible in a range of contexts. Assuming they have mastered the skills of comparing, contrasting and recognising in Levels 3 and 4, Levels 5 and 6 expects students to provide evidence of a comprehensive understanding in various contexts and for a range of communicative purposes. The achievement objectives have been reduced by two to five in Levels 5 and 6 and they are less descriptive in terms of skills and knowledge. However, the broad, flexible nature of the framework at these levels implies that students’ cognitive capabilities can be extended. Implementation and programming of the curriculum relies on the school, teacher, language program and pedagogy. For this reason, the framework cannot be considered limited as it encompasses big ideas and concepts that can be built upon and adapted to suit the individual language and school contexts.

AC – Rigour

Rigour: Challenging

The AC: L, Japanese Year 10 (F-10) 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 *analysing, debating, evaluating, explaining, interpreting, negotiating, persuading, reflecting* and *summarising*. Students are expected to develop skills, knowledge and understanding that go beyond recall and recognition of learned concepts and principles. Learners are expected to manipulate the language appropriately according to context, audience and place, to be able to “interpret and create meaning”, “analyse and apply linguistic, cultural and textual features”, and “understand that language has the power to influence social relationships, beliefs and values”.

While not mandatory, the AC 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 debating pros and cons related to topics, using comparisons when expressing thoughts and ideas, negotiation options, solving problems and discussing alternative decisions, making judgements, comparing different perspectives, analysing and discussing the emotional impact of text features and reflecting on their own experiences of the process of translating. Elaborations also provide suggestions for teacher action that encourage multiple approaches, strategies and solutions to help facilitate students' deeper and broader engagement with the Japanese 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, Japanese Year 10 (F-10) provides students with many opportunities for cognitive and intellectual challenge. The knowledge and skills expected in the content descriptions and achievement standards are consistently **challenging**.

NZC – Rigour

Rigour: Moderate

The NZC: LL Levels 5 and 6 develops skills and knowledge through one key proficiency statement and five achievement objectives indicating a **moderate** degree of rigour. There is no curriculum guide to unpack the achievement objectives at these levels. The NZC: LL framework cannot be deemed limited nor challenging at these levels. The achievement objectives are skills and knowledge-based and require students to communicate information, interact and understand in a variety of contexts and for different purposes. There is no explicit mention that students at Levels 5 and 6 are expected to critically analyse, evaluate or reflect on the dynamic nature of second language learning and culture or make connections between cultural practices and values and language use, such as formulaic expressions, and consider how these affect intercultural communication. However, based on assessment and pedagogical advice in NZC: LL it has the flexibility to allow rigorous exploration of concepts and differentiated movement between levels. Individual teachers are responsible for implementation and programming and it is up to them to make professional judgements regarding students' cognitive capabilities and abilities and choose the corresponding level of study.

The content is presented as a framework with no specific language content and skills are generic in nature. Even the language specific curriculum guides do not provide detail in relation to linguistic elements or understanding and more provide ideas of how students may demonstrate knowledge and skills in relation to the achievement objectives. There is limited information and guidance regarding the level of cognitive demand placed on students to accomplish tasks and how to gauge a students' depth of understanding of the content, including acquisition of skills aligned to the achievement objectives and overall proficiency statement.

Comparative Analysis

The Levels 5 and 6 NZC: LL expects students to understand and produce more complex language and communicate beyond the immediate context, for example, past and future events. Students are also expected to understand and produce a variety of text types (Council of Europe, 2001). The proficiency statement is further broken down into five achievement objectives detailing knowledge and skills. The Year 10 AC: L, Japanese expects students to bring to their learning existing knowledge of Japanese language and culture and a range of learning strategies. Students develop awareness of the world beyond their own and engage with youth-related and social and environmental issues. They are expected to analyse, reflect on and monitor their language learning and intercultural experiences and use Japanese to communicate and interact; to access and exchange information; to express feelings and opinions; to participate in imaginative and creative experiences; and to create, interpret and analyse a wider range of texts and experiences. There are two main strands of communicating and understanding, eight sub-strands and numerous content descriptors which are further broken down into elaborations.

Compared to NZC: LL framework, AC: L, Japanese Year 10 is prescriptive, detailed and considered comprehensive in terms of depth, breadth and rigour. The NZC: LL framework is considered fundamental in terms of depth, breadth and rigour due to the flexible nature of the curriculum and schools' and teachers' ability to adapt it to suit a range of languages and contexts.

Unlike AC: L, Japanese, NZC: LL does not provide alternative language sequences or learner pathways. It should be noted that Level 1 is the entry point for language study, regardless of the year level.

The NZC: LL does not prescribe content, and skills and knowledge can be applied to all second language learning, regardless of the language.

i) Key competencies (NZC) and General capabilities (AC)

Comparative Curricula

Australian Curriculum
New Zealand Curriculum

Version 8.3, 2016
2007

Year/Grade Level

Australian Curriculum: F-Year 10
New Zealand Curriculum: Years 1-11³⁵

Learning Area/Subject

Australian Curriculum: General capabilities (AC: GC)
New Zealand Curriculum: Key competencies (NZC: KC)

This section is a comparison of the AC: General capabilities and The NZC: Key competencies. All references in this section are sourced from the curriculum documents AC: F-10: General capabilities (ACARA, 2018i) and The NZC: Key competencies (NZME, 2014c) unless otherwise stated.

New Zealand key competencies

The NZC describes five 'key competencies' identified as the knowledge, skills, attitudes and values that all people need for today, for the future and to become successful lifelong learners. Intended to replace the 'essential skills' of the 1990s curriculum and building on the work undertaken by the OECD DeSeCo (Definition and Selection of Competencies) project in 1997, the key competencies articulated in The NZC were developed to reflect national values and aspirations for the future for all learners. The NZC key competencies are:

- Thinking
- Relating to others
- Using language, symbols and texts
- Managing self
- Participating and contributing. (NZME, 2007a, p. 12)

The information provided on The NZC website emphasises that the key competencies do not stand alone. They are embedded within The NZC and through *intentional* inclusion, in context, across learning areas to support the vision of The NZC for young people to become confident, connected, actively involved, lifelong learners (NZME, 2007a, p. 8).

While learners may draw on a wide range of competencies, those labelled as "key" are seen to be **universal** rather than situation specific...While any one task will also require certain situation-specific competencies, key competencies are needed across a wide range of situations. (Hipkins, 2006, pg. 4)

The Learning to Learn principle underpins the intent of the key competencies and informs curriculum decision making (NZME, 2007a, p. 9).

The inclusion of the key competencies within The NZC was accompanied by a series of research projects which contributed to a developing understanding of three main themes:

1. What are the key competencies? (their nature)
2. How should the key competencies be included in a local curriculum? (weaving together with other curriculum components)

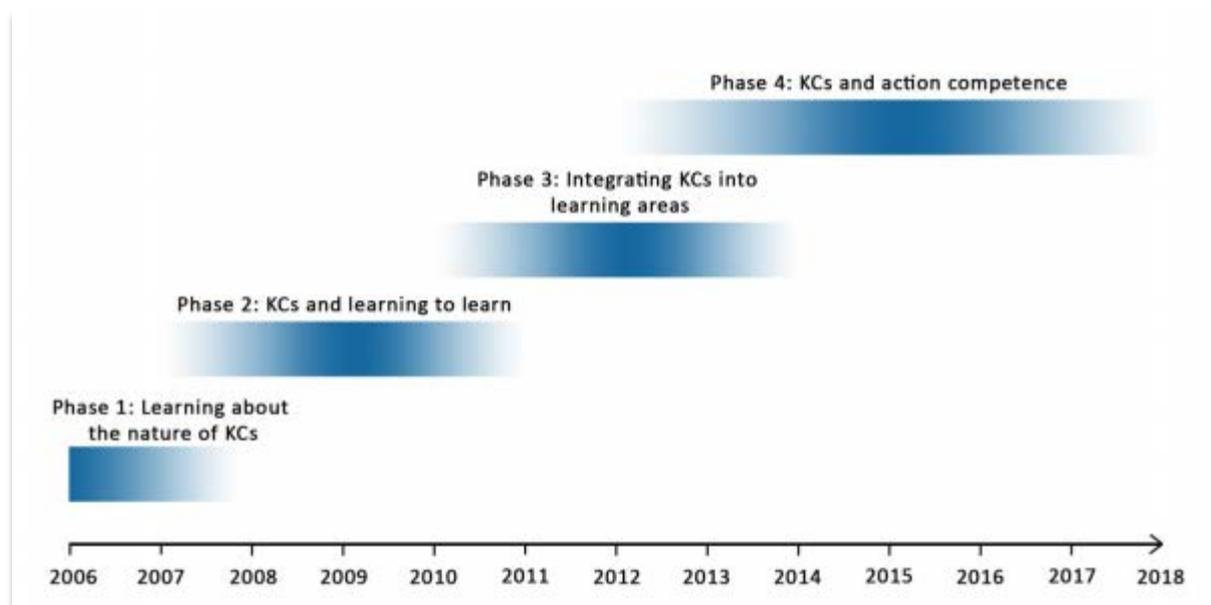
³⁵ For further information about comparative points in this study see Section 3.2 Comparative study: Method

3. How should the key competencies impact intended learning? (their role). (McDowall & Hipkins, 2018, pg. 2)

This process of development of the key competencies is described in the paper *How the key competencies evolved over time: Insights from the research* and was typified by four phases as shown in figure 3.3 below. From the research papers provided on The NZC website a narrative emerges of extensive support for teachers and an iterative process of implementation and reflection.

Two of the projects conducted throughout this phase focused on the key competencies within the context of the learning areas. The key competencies and effective pedagogy project tied the development of the competencies to pedagogy. The science capabilities project identified the relationship between the key competencies and the *Nature of science* strand within the Science curriculum.

Three main projects undertaken in this period have focused on researching the key competencies for the future, describing progress for students with additional learning needs and an analysis of the National Monitoring Study of Student Achievement assessments identifying the how learning area content and key competencies were expressed within these rich tasks. Additionally, some research is being undertaken into how students progress in their development of the key competencies.



From “How the key competencies evolved over time: Insights from the research” by Sue McDowall and Rosemary Hipkins (2018)
https://www.researchgate.net/publication/325389433_How_the_key_competencies_evolved_over_time_Insights_from_the_research). Copyright by the New Zealand Council for Educational Research. Reprinted with permission.

Figure 3. 3 Four phases in the evolving understanding of key competencies

Comparison and alignment

There are strong similarities and alignment between The NZC key competencies and the AC general capabilities. Both curricula have identified thinking skills, relationships with others

and self, literacies, and the importance of citizenship, as being integral to the development of young people as they progress through their years at school and in their life beyond school.

The alignment of these concepts and aptitudes is described in Table 3.42.

Table 3. 42 NZC key competencies and AC general capabilities

New Zealand Curriculum Key Competencies	Australian Curriculum General Capabilities
Thinking	Critical and Creative Thinking Capability
Relating to others	Personal and social capability,
Using language, symbols and texts	Literacy, Numeracy and ICT Capability
Managing self	Personal and social capability
Participating and contributing	Personal and social capability, Ethical Understanding and Intercultural Capability

The NZC defines key competencies as "capabilities for living and lifelong learning" (NZME, 2007a, p.12). The use of the word "capability" cues a focus on what students are capable of doing and becoming. This has implications for how we think about the types of learning experiences that will really stretch students as they encounter purposeful key competency/learning area combinations (NZME, 2014m).

The key difference between The NZC key competencies and the AC general capabilities is in the detail that is provided relating to expectations for students. The NZC key competencies are broad descriptions that are developed in each learning area as required as part of school-based curriculum design. The AC general capabilities are detailed in learning continua which provide specific descriptions of what students can typically do by the end of a stage of schooling.

Thinking Key Competency/Critical and Creative Thinking Capability

The NZC *Thinking* key competency aligns with the AC *Critical and creative thinking capability*. Both concepts highlight the place of metacognition, problem-solving, posing questions, reflection and seeking and using information as key skills or capabilities to be developed and young people progress through schooling.

The AC provides a learning continuum for *Critical and creative thinking* which details the development of each sub-element from Foundation to Year 10 as a sequence of learning moving from simple to more complex behaviors. The NZC *Thinking* key competency information is provided as guidance for teachers to explicitly develop in context as they develop teaching and learning experiences. The NZC provides case studies, planning proformas and examples of practice for educators to use as they develop school-based approaches.

Table 3.43 details the alignment of the concepts articulated in The NZC *Thinking* key competency materials and descriptions to the AC *Critical and creative thinking* sub-elements detailed in the learning continuum.

Table 3. 43 *Alignment of NZC Thinking Key Competency to AC Critical and Creative Thinking Capability*

NZC Thinking Key Competency Concepts	AC Critical and Creative Thinking Sub elements
Metacognition	Thinking about thinking (meta cognition)
Making sense of information, experiences and ideas	Organizing and processing information, imagine possibilities and connect ideas
Making decisions	Seek solutions and put ideas into action
Developing understanding	Identifying and clarifying information and ideas
Seeking and using information (knowledge),	Identifying and clarifying information and ideas
Reflecting on learning	Reflect on processes, apply logic and reasoning
Asking questions,	Pose questions
Challenging perceptions and assumptions.	Consider alternatives
Shaping actions	Seek solutions and put ideas into action, Transfer knowledge into new contexts
Problem-solving	Seek solutions and put ideas into action

The *Thinking* key competency in The NZC is defined as:

The NZC resources provide information and support for teachers and schools to develop a deeper understanding of how the *Thinking* key competency can be considered in the context of learning experiences for young people. The *Insights into important aspects of the key competencies* material describes the necessity of providing opportunities for learners to explore specific ways of thinking (NZME, 2014m).

The types of thinking described include cause and effect thinking, evidence-based thinking, embodied thinking, lateral thinking, systems thinking, values clarification and epistemic thinking. The *Thinking* competency is supported by a range of ‘engaging examples of practice’ which exemplify the various approaches schools have taken when including this competency in practice within the learning areas (NZME, 2014m).

The AC provides a learning continuum for *Critical and creative thinking* which details the development of each sub-element from Foundation to Year 10 as a sequence of learning moving from simple to more complex behaviors. The NZC *Thinking* key competency information is provided as guidance for teachers to explicitly develop in context as they develop teaching and learning experiences. The NZC provides case studies, planning proformas and examples of practice for educators to use as they develop school-based approaches.

Relating to others Key Competency/Personal and social capability

The NZC *Relating to others* key competency aligns with the AC *Personal and social capability* – ‘Social Awareness’ and ‘Social Management’ elements. The NZC *Relating to others* key competency aligns with the AC *Personal and social capability* – ‘social awareness’ and ‘social management’ elements. The AC *Personal and social capability* has four elements, two relating to developing a sense of self and two relating to understanding and managing engagement with others. The AC *Personal and social capability* has four elements, two related to developing a sense of self and two related to understanding and managing engagement with others.

The NZC description of *Relating to others* highlights aptitudes related to effective communication and collaboration and places emphasis on the importance of negotiation and understanding points of view. The AC *Personal* as essential focus points for development when addressing this key competency. The AC *Personal and social capability* elements related to social awareness and social management mirror these focus points and identify the development of skills related to understanding relationships, communicating and collaborating effectively with others and being able to appreciate diverse perspectives as key aspects to be addressed over the course of schooling.

The AC provides a learning continuum for Personal and social capability which details the development of each sub-element from Foundation to Year 10 as a sequence of learning moving from simple to more complex behaviors across a range of discreet ‘skills’ or sub-elements. For example, in relation to the *Working Collaboratively* sub element:

Foundation students are expected to:

- share experiences of cooperation in play and group activities

By Year 10 students are expected to:

- critique their ability to devise and enact strategies for working in diverse teams, drawing on the skills and contributions of team members to complete complex tasks.

Table 3.44 details the alignment of the concepts articulated in The NZC *Relating to others* key competency materials and descriptions to the AC *Personal and social capability* ‘Social awareness’ and ‘Social management’ sub-elements detailed in the learning continuum.

Table 3. 44 *Alignment of NZ Relating to others Key Competency to AC Personal and social capability – Social-awareness and social management elements*

NZC Relating to others key competency Concepts	AC Personal and social capability, Social Awareness and Social Management sub elements
Interacting with others	Work collaboratively
Points of view	Appreciate diverse perspectives
Negotiation	Communicate effectively
Share ideas	Communicate effectively
Take on roles	Work collaboratively
Effect on others	Understand relationships
Compete or collaborate	Work collaboratively, Make decisions
Work effectively together	Communicate effectively, Negotiate and resolve conflict
Develop new approaches ideas and ways of thinking	Develop leadership skills

The *Relating to others* key competency in The NZC is defined as:

. . . interacting effectively with a diverse range of people in a variety of contexts. This competency includes the ability to listen actively, recognise different points of view, negotiate, and share ideas. Students who relate well to others are open to new learning and able to take different roles in different situations. They are aware of how their words and actions affect others. They know when it is appropriate to compete and when it is appropriate to co-operate. By working effectively together, they can come up with new approaches, ideas, and ways of thinking. (NZME, 2017d)

The explanations and resources provided on The NZC website emphasise that the learning areas provide different opportunities to focus on this key competency and show school level exemplars of the approaches a range of schools have taken to develop the competency. Information is provided as guidance for teachers to explicitly address the described skills in context as they develop teaching and learning experiences. The NZC provides case studies, planning proformas and examples of practice for educators to use as they develop school-based approaches. Implicit in the information is the importance for teachers to provide multiple opportunities across the learning areas for students to practice and refine this competency.

The resource material also emphasizes that the learning areas provide different opportunities to focus on important aspects of this key competency and the engaging examples of practice materials provide school level exemplars of the approaches a range of schools have taken to develop these skills as part of the teaching and learning experiences for students.

The Australian Curriculum provides a learning continuum for Personal and social capability which details the development of each sub-element from Foundation to Year 10 as a sequence of learning moving from simple to more complex behaviors across a range of discreet 'skills' or sub-elements.

Using language, symbols and texts key competency/Literacy, Numeracy and ICT Capability

The NZC *Using language, symbols and texts* key competency has some alignment to the AC general capabilities for *Literacy, Numeracy* and *ICT Capability*. Table 3.45 demonstrates these connections.

Table 3. 45 *Alignment of NZ Using language, symbols and texts Key Competency to AC general capabilities*

NZC Using language, symbols and texts key competency concepts	AC Literacy, Numeracy and ICT Capability
Making meaning	Literacy Numeracy
Creating and communicating	Literacy ICT Capability
Use ICT	ICT Capability

The NZC *Using language, symbols and texts* key competency is defined as:

. . . working with and making meaning of the codes in which knowledge is expressed. Languages and symbols are systems for representing and communicating information, experiences, and ideas. People use languages and symbols to produce texts of all kinds: written, oral/aural, and visual; informative and imaginative; informal and formal; mathematical, scientific, and technological.

Students who are competent users of language, symbols, and texts can interpret and use words, number, images, movement, metaphor, and technologies in a range of contexts. They recognise how choices of language, symbol, or text affect people's understanding and the ways in which they respond to communications. They confidently use ICT (including, where appropriate, assistive technologies) to access and provide information and to communicate with others. (NZME, 2007a, p. 12)

This key competency focuses on the importance of active meaning making within the context of the different discipline areas. The supporting information on The NZC website highlights how this competency is flexibly applied within a learning area:

active meaning-making can be seen as occurring at the intersection of multiple modes which all have their specific conventions, usages, and affordances in different discipline areas. (NZME, 2014m)

While the development of literacy, numeracy and digital skills across disciplines is a key component of this competency it has broader and deeper implications for student learning. The 'Engaging examples of practice' highlight the discipline specific approaches schools have taken to develop this competency across a range of year levels and school contexts.

The AC general capabilities of Literacy, Numeracy and ICT Capability are identified within relevant learning area content descriptions and elaborations. This identification or 'tagging' works is an indicator for teachers that there is the potential to develop these capabilities as they teach the learning area content. Each capability is supported by a learning continuum that is typically aligned to stages of schooling, however sub elements are described across Levels 1-6 to emphasise that development is independent of student age.

Managing Self key competency/ Personal and social capability

The NZC Managing *Self* key competency aligns with the AC Personal and *Social* Capability – Self Awareness and Self-Management elements. The AC Personal and *Social* Capability has four elements, two related to developing a sense of self and self-management and two related to understanding and managing engagement with others.

Table 3.46 describes the alignment of the concepts articulated in The NZC *Managing Self* key competency materials and descriptions to the elements of the AC Personal and *Social* Capability detailed in the learning continuum.

Table 3. 46 *Alignment of NZ Managing Self Key Competency to AC Personal and social capability – Self-awareness and self-management elements*

NZC Managing Self key competency concepts	AC Personal and social capability, Self-Management and Self-Awareness elements
Self-assessment	Recognise emotions, Develop reflective practice
Goal setting	Recognise personal qualities and achievements, Develop self-discipline and set goals, Understand themselves as learners
Leadership	Develop leadership skills
Independence	Develop reflective practice, Become confident, resilient and adaptable
Resilience	Express emotions appropriately, Become confident, resilient and adaptable
Self-Motivation	Develop self-discipline and set goals
Reliable	Work independently and show initiative
Capable	Become confident, resilient and adaptable

The *Managing self* key competency in The NZC is defined as:

. . . associated with self-motivation, a “can-do” attitude, and with students seeing themselves as capable learners. It is integral to self-assessment.

Students who manage themselves are enterprising, resourceful, reliable, and resilient. They establish personal goals, make plans, manage projects, and set high standards. They have strategies for meeting challenges. They know when to lead, when to follow, and when and how to act independently. (NZME, 2017d)

The information and resources provided on The NZC website to support this competency highlight that risk taking and supporting learners to develop a sense of being powerful learners are important aspects of this competency.

The NZC website also provides advice for parents on the nature and importance of the key competencies and provides suggestions on activities parents might try at home to support the development of specific competencies. For this key competency the advice provided details the importance of resilience and persistence as students develop the competency and the examples provided are practical and easily achievable in the home setting.

The AC *Personal and Social Capability* self-management and self-awareness elements focus on the skills and abilities teachers may typically expect to observe in students by the end of a stage of schooling. The continuum is detailed and allows for teachers to scaffold or differentiate learning experiences for young people across a range of learning areas and a range of learning contexts.

Participating and contributing key competency/Personal and social capability, Intercultural Understanding and Ethical Understanding

The *Participating and contributing* key competency in The NZC is defined as:

. . . being actively involved in communities. Communities include family, whānau, and school and those based, for example, on a common interest or culture. They may be drawn together for purposes such as learning, work, celebration, or recreation. They may be local, national, or global. This competency includes a capacity to contribute appropriately as a group member, to make connections with others, and to create opportunities for others in the group.

Students who participate and contribute in communities have a sense of belonging and the confidence to participate within new contexts. They understand the importance of balancing rights, roles, and responsibilities and of contributing to the quality and sustainability of social, cultural, physical, and economic environments. (NZME, 2017d)

This key competency does not align precisely with a single general capability in the AC, but rather captures elements or sub elements of three of the general capabilities - Personal and Social Capability, Intercultural Understanding and Ethical Understanding.

This NZ key competency describes the development of knowledge, skills and attitudes related to being an effective and responsible member of society, the development of skills such as collaboration and teamwork at local, national and global scales, as well as highlighting the importance of understanding the diverse nature of a range of communities and their role within them.

The AC general capabilities with alignment to this key competency also articulate the importance of the development of civic responsibility and a broad understanding of the role of different communities within the larger fabric of Australian society. Within the Personal and Social capability sub-elements the importance of developing strengths related to leadership and contributing to civil society are also emphasised.

Table 3. 47 *Alignment of NZ Participating and contributing key competency to AC Personal and social capability, Intercultural Understanding, Ethical Understanding*

NZC Participating and contributing key competency concepts	AC Personal and social capability, Intercultural Understanding, Ethical Understanding
Community involvement	Contribute to civil society (PSC) Develop leadership skills (PSC) Reflect on Intercultural Experiences (ICU)
Creating opportunities for others	
Understanding roles, rights and responsibilities	Explore rights and responsibilities (EU) Challenge stereotypes and prejudices (ICU) Explore rights and responsibilities (EU)
Contributing to society	Contribute to civil society (PSC) Develop leadership skills (PSC)

j) Cross-curriculum priorities

Comparative Curricula

Australian Curriculum

Version 8.3, 2016

New Zealand Curriculum

2007

Year/Grade Level

Australian Curriculum: Foundation-Year 10

New Zealand Curriculum: Years 1-11³⁶

Dimension

Australian Curriculum: Cross-curriculum priorities: Aboriginal and Torres Strait Islander Histories and Cultures

New Zealand Curriculum: Māori Histories and Cultures

This section is a comparison of the AC: Cross-curriculum priority Aboriginal and Torres Strait Islander Histories and Cultures and The NZC: Perspectives on Māori Histories and Cultures. All references in this section are sourced from the curriculum documents AC: F-10: Cross Curriculum priorities: Aboriginal and Torres Strait Islander Histories and Cultures (ACARA, 2018j) and The NZC: Principles: Cultural Diversity (NZME, 2015b) and The NZC: Principles: The Treaty of Waitangi (NZME, 2012b) unless otherwise stated.

AC: Aboriginal and Torres Strait Islander Histories and Cultures

Aboriginal and Torres Strait Islander Histories and Cultures are one of three cross-curriculum priorities (CCP) in the AC, designed to be integrated across all learning areas as appropriate, to develop in all students cultural and intercultural awareness. As one of three priorities that make up one of the three dimensions of the AC, the cross-curriculum priorities are:

... 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. (ACARA, 2018j)

For example, in AC: Mathematics the overview of the cross-curriculum priority explains that:

Students can explore connections between representations of number and pattern and how they relate to aspects of counting and relationships of Aboriginal and Torres Strait Islander cultures. Students can investigate time, place, relationships and measurement concepts within Aboriginal and Torres Strait Islander contexts. Through the application and evaluation of statistical data, students can deepen their understanding of the lives of Aboriginal and Torres Strait Islander Peoples. (ACARA, 2018j)

The achievement standards in the AC do not include explicit reference to the CCPs.

Recent additions, published on the AC website in October 2018, in relation to the Aboriginal and Torres Strait Islander Histories and Cultures priority in AC: Science include a further 95 elaborations that focus on the CCP. As elaborations, they are provided as contextual options to assist teachers to deliver the Science curriculum content. Supporting each of these new

³⁶ For further information about comparative points in this study see Section 3.2 Comparative study: Method

elaborations and the existing 13 elaborations is a teacher background information (TBI) resource for Years 7-10 that details the cultural and scientific aspects of each of the elaborations. Foundation – Year 6 teacher background information are under development.

Complementing the AC content and elaborations are further resources for teachers, which illustrate school practice integrating the CCP in their teaching and learning programs.

NZC: Māori Histories and Cultures

Respecting the *Treaty of Waitangi* and that New Zealand is a bi-cultural nation, there are two separate documents of national curricula: *Te Marautanga o Aotearoa* (TMoA) and the *New Zealand curriculum for English-medium teaching and learning in years 1 – 13*. Both The NZC and TMoA aim to be responsive to Māori learners. Together, the two documents are designed to help schools give effect to the partnership that is at the core of New Zealand's founding document, *Te Tiriti o Waitangi* (*The Treaty of Waitangi*).

Further, the eight principles of The NZC includes the *Treaty of Waitangi* whereby the curriculum acknowledges the principles of the *Treaty of Waitangi*, and the bicultural foundations of Aotearoa New Zealand. All students have the opportunity to acquire knowledge of te reo Māori me ōna tikanga (Māori language and culture). While there are consistent, overarching principles and aims of the two curricula (ERO, 2012), TMoA is not a translation of The NZC and is written in Māori, from a Māori perspective. It acknowledges Māori cultural identity and values the culture and heritage of all students and their families (NZME, 2007a, p. 6).

TMoA has the same eight learning areas as The NZC with an extra subject for Te Reo Māori (Māori language and literature). In addition to providing a framework that meets the specific needs of students in Māori-medium schools and settings, TMoA is also intended for use in English-medium schools (ERO, 2012).

In the English-medium NZC, Māori perspectives are included in the learning areas. For example, in the Social Sciences students “explore the unique bicultural nature of New Zealand society” and Arts education “embraces toi Māori, valuing the forms and practices of customary and contemporary Māori performing, musical, and visual arts”. Whilst one of the three CCP of the AC is Aboriginal and Torres Strait Islander Histories and Cultures, these perspectives are not represented as strongly in the AC.

Comparative Analysis

The Indigenous populations of Australia and New Zealand are different, and the respective curricula and the ways their histories and cultures are embedded, are also different. Perhaps the greatest example of difference is that New Zealand has one Indigenous language with the TMoA curriculum existing in parallel with the English-medium curriculum. In contrast, Australia has around 120 surviving Aboriginal and Torres Strait Islander language groups diminished from 250 languages before colonisation (Australian Institute of Aboriginal and Torres Strait Islander Studies, 2018).

The AC includes the CCP and also a framework for Aboriginal Languages and Torres Strait Islander Languages. The Languages framework recognises the diversity of languages, language learners and the complexity and differences between the ecologies of languages and the communities who are owners and custodians of those languages.

The TMoA framework is extensive compared to the CCP framework provided in the AC. It sets the direction for teaching and learning in Māori-medium primary and secondary schools that enables students to:

- develop as confident and resilient individuals
- realise their full potential and lead fulfilling lives
- communicate effectively in te reo Māori
- take pride in their identity
- participate and succeed in te ao Māori me te ao whānui.

In New Zealand the National Curriculum has two media for delivery of curriculum to allow for the localisation of curriculum in all learning areas. With this flexible framework, teachers and schools are required to ensure that the curriculum is localized to meet the needs of students within their own context and to meet community expectations and aspirations to ensure it is relevant.

k) Student diversity

Comparative Curricula

Australian Curriculum

Version 8.3, 2016

New Zealand Curriculum

2007

Year/Grade Level

Australian Curriculum: F-Year 10

New Zealand Curriculum: Years 1-11³⁷

Dimension

Australian Curriculum: Student diversity

New Zealand Curriculum: Inclusion

This section is a comparison of approaches to the AC: Student diversity and The NZC: Inclusion. All references in this section are sourced from the curriculum documents AC: F-10: Student diversity (ACARA, 2018k) and The NZC: Inclusion (NZME, 2015c) unless otherwise stated.

Expectations: Knowledge and Skills

Guided by the *Melbourne Declaration on Educational Goals for Young Australians* (MCEETYA, 2008), the development of the AC was based on the premise that “All students are entitled to rigorous, relevant and engaging learning programs drawn from a challenging curriculum that addresses their individual learning needs” (ACARA, 2018k). The AC “sets the expectations for what all young Australians should be taught, regardless of where they live in Australia or their background” (ACARA, 2018o). Consideration of accessibility to the AC for all students is informed by a range of legislation, including the *Disability Discrimination Act 1992* (Australian Human Rights Commission, 2016) which led to the *Disability Standards for Education 2005* (AGDET, 2018a).

Designed to be inclusive of all students, the AC’s three-dimensional design encompasses eight learning areas, seven general capabilities and three cross-curriculum priorities, giving teachers the flexibility to cater for student diversity by personalising learning. Teachers can address individual learning needs by incorporating specific teaching of the general capabilities or cross-curriculum priorities through the learning area content; all decisions regarding personalised learning are based on assessment of a student’s current levels of learning, strengths, goals and interests.

The AC is written for teachers and provides explicit advice about the use of the general capabilities and the cross-curriculum priorities to teach aspects of learning area content to students with diverse needs. In addition to general advice, more specific advice is provided to assist the learning of students with disability, students identified as gifted and talented, and students for whom English is an additional language or dialect (EAL/D). Illustrations of practice and other materials support teachers in their work.

The process for designing teaching and learning programs is the same for all students. As a starting point, teachers utilise the AC learning area content aligned to the student’s chronological age. Teachers personalise programs by:

³⁷ For further information about comparative points in this study see Section 3.2 Comparative study: Method

- drawing from learning area content at different levels along the Foundation to Year 10 sequence to personalise age-equivalent learning area content
- using the general capabilities and/or cross-curriculum priorities to adjust the learning focus of the age-equivalent learning area content
- aligning individual learning goals with age-equivalent learning area content.

Teachers assess students' progress through the AC in relation to the achievement standards. Some students' progress will be assessed in relation to their individual learning goals; that is, an individual learning program may be designed by a school to ensure that a student can access relevant aspects of the AC.

In Australia, state and territory education authorities carry responsibility for schools and teachers and for the delivery of the AC. Thus, approaches to assessment and reporting differ across the states and territories, as do the methods of catering for students with diverse needs.

The NZC (NZME, 2015f) identifies that it is a curriculum designed to meet the diverse needs of all students.

The New Zealand Curriculum is for all students. It does not discriminate; rather it requires that all students' identities, languages, cultures, abilities, and talents are recognised. In any class, diverse learners will be learning at, above, or below the expectations for their year level. The classroom curriculum must therefore be responsive to the learning needs of all of these students. (NZME, 2015g, p4)

This is underlined by the Cultural Diversity principle (NZME, 2007a, p. 9).

Section 8 (1) of *The Education Act 1989* (New Zealand Government Parliamentary Counsel Office, 2018a) articulates that students with special educational needs have the right to receive the same education as their peers. The NZC prioritises teaching, learning and assessment that respond to the unique differences of individuals. The key objectives of the curriculum that provide direction in relation to student diversity are outlined in *Establishing enduring objectives for the education system* (NZME, 2018s).

This document highlights the importance of the following:

- helping each child and young person attain educational achievement to the best of their potential
- promoting the development of:
 - resilience, determination, confidence, and creative and critical thinking
 - good social skills and the ability to form good relationships
 - participation in community life and fulfilment of civic and social responsibilities
 - preparedness for work.
- instilling an appreciation of the importance of:
 - the inclusion within society of different groups and persons with different personal characteristics
 - the diversity of society and cultural knowledge
 - identity, and the different official languages
 - the Treaty of Waitangi and te reo Māori. (NZME, 2018s)

In line with the premise that all students are able to learn, and are capable of being successful, The NZC supports schools in meeting their responsibility to respond to the needs of all their learners and their community while developing their own curriculum. In this process the goals of students and whānau are valued. This NZC priority embraces Part 1A (3) of *The Education (Update) Amendment Act 2017* where it states that a key focus of compulsory education is “to focus on helping each child and young person to attain educational achievement to the best of his or her potential”. To add further depth to this aspect of learning, *The Education (Update) Amendment Act 2017* emphasises an appreciation of the importance of diversity in society (New Zealand Parliamentary Counsel Office, 2018b).

Priority is given by the NZME to the development of an extensive range of research-based advice and resources to support the delivery of The NZC. It achieves this by holding high expectations of all students and by providing support materials for teachers in making the curriculum accessible to all students. To achieve this the NZME acknowledges that the voices of student, whānau, and teachers all need to be considered. The resources include advice and support for school leaders and teachers in relation to:

- inclusion and inclusive practices
- professional learning
- English to Speakers of Other Languages (ESOL) – English language learners
- Gifted and talented students.

Comparative Analysis

Both the AC and The NZC are clearly aligned to meeting the diverse needs of all students. Both documents ensure that a range of opportunities exist for students to engage in the learning process at a student’s point of need.

In relation to addressing the diverse needs of students through curriculum there are a few points of comparison that should be noted.

A point of comparison lies with the way the NZME has supported the effective delivery of the curriculum with a range of online resources. These resources not only acknowledge a well-designed curriculum as a key factor in student success, as does the design of the AC, but they acknowledge the impact of leadership and building teacher skills, knowledge and disposition for using the curriculum to meet the diverse needs of all students.

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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: HASS	Australian Curriculum: Humanities and Social Sciences
AC: H	Australian Curriculum: History
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
AG	Australian Government
AGDET	Australian Government Department of Education and Training
AITSL	Australian Institute for Teaching School Leadership
AUD	Australian Dollar
CCP	Cross-curriculum priorities
CD	Content Descriptions
COA	Commonwealth of Australia
COAG	Council of Australian Governments

CPR	Cardiopulmonary Resuscitation
DoK	Depth of Knowledge
EAL/D	English is an Additional Language or Dialect
EARU	Educational Assessment Research Unit
EIU	Economist Intelligence Unit
ERO	Education Review Office
ESL	English as a Second Language
ESOL	English to Speakers of Other Languages
GCN	Global Curriculum Network
GDP	Gross Domestic Product
IBE	International Bureau of Education
ICT	Information and Communication Technology
KC	Key Concepts
KP	Key Processes
LOTE	Language Other Than English
LPF	Learning Progression Framework
MMCEETYA	Ministerial Council on Education, Employment, Training and Youth Affairs
NAEP	National Assessment of Educational Progress
NAPLAN	National Assessment Program for Literacy and Numeracy
NCEA	National Certificate of Educational Achievement
NDP	Numeracy Development Projects
NLLP	National Literacy Learning Progressions
NMSSA	National Monitoring Study of Student Achievement
NNLP	National Numeracy Learning Progressions
NZC	The New Zealand Curriculum
NZC: E	The New Zealand Curriculum: English
NZC: HPE	The New Zealand Curriculum: Health and Physical Education
NZC: KC	The New Zealand Curriculum: Key competencies

NZC: LL	The New Zealand Curriculum: Learning Languages
NZC: MS	The New Zealand Curriculum: Mathematics and Statistics
NZC: S	The New Zealand Curriculum: Science
NZC: SS	The New Zealand Curriculum: Social Sciences
NZC: T	The New Zealand Curriculum: Technology
NZC: TA	The New Zealand Curriculum: The Arts
NZCER	New Zealand Council of Educational Research
NZEI	New Zealand Educational Institute
NZI	New Zealand Immigration
NZME	New Zealand Ministry of Education
NZQA	New Zealand Qualifications Authority
NZSL	New Zealand Sign Language
OECD	Organisation for Economic Cooperation and Development
PaCT	Progress and Consistency Tool
PIRLS	Progress in International Reading Literacy Study
PISA	Programme for International Student Assessment
PPP	Purchasing power parity
SHE	Science as a Human Endeavour
SIS	Science Inquiry Skills
STEM	Science, Technology, Engineering, Mathematics
SU	Science Understanding
TALIS	Teaching and Learning International Survey
TBI	Teacher background information
TIMSS	Trends in International Mathematics and Science Study
TMoA	Te Marautanga o Aotearoa
UNESCO	United Nations Educational, Scientific and Cultural Organisation
USD	United States Dollar
VUCA	Volatile, Uncertain, Complex, Ambiguous

WHO

World Health Organisation

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