
2021 Recommendation and Rationale for the New Zealand Curriculum NCEA Level 2 and 3 final subjects (Education Report: Annex 2)

The New Zealand Curriculum NCEA Level 2 and 3 Subjects – Recommendations and Rationale

September 2021

Summary

This Annex confirms the final recommended subjects for NCEA Levels 2 and 3 derived from the New Zealand Curriculum (NZC) and explains the rationale for final subject recommendations by Learning Area.

Contents

Summary of Recommendations and Rationale	3
The New Zealand Curriculum Final Subject List	4
Recommendations and Rationale by Learning Area	7
Learning Area 1: English	7
Learning Area 2: The Arts	8
Learning Area 3: Health and Physical Education	11
Learning Area 4: Learning Languages	13
Learning Area 5: Mathematics and Statistics	16
Learning Area 6: Science	18
Learning Area 7: Social Sciences	20
Learning Area 8: Technology	23

Summary of Recommendations and Rationale

The final NZC subject list for NCEA Levels 2 and 3 has 56 recommended subjects across the 8 Learning Areas, with a further 7 subjects to be considered for future development. These subjects reflect policy objectives for increasing specialisation at NCEA Levels 2 and 3, mana ōrite mo te mātauranga Māori, ensuring clear pathways into further education and employment, and consideration of sector concerns about resourcing and capability, particularly with regards to new and refocused subjects.

Results from the online survey, which received a total of 2024 responses, indicate that there is a moderate level of support for the package of NCEA Level 2 and 3 subjects proposed for the NZC (55.5% of respondents agreed or strongly agreed), and for most learning areas there was a high level of agreement that the proposed subjects covered all the significant learning.

The exception to this was the Arts, where more respondents disagreed or strongly disagreed (49.5%) than agreed or strongly agreed (36.1%) with the question posed. There was a large degree of contention about the proposed subjects in the Arts, and a perception that we were reducing specialisation for visual arts students.

Technology also gave rise to a split in opinion but this, unlike the Arts, was to be expected, especially in light of the report published by the Royal Society during public engagement. Many comments from survey respondents centred on how best to structure the Technology Learning Area, and the appropriateness of the three- and five-subject options. Respondents significantly favoured a five-subject Technology option over a three-subject option.

Key differences between the proposed subject list and the final list are that we recommend:

- closely related subjects be developed in parallel to ensure two distinct and complementary subjects are offered (e.g. **Music** subjects, and **Mathematics** and **Statistics**)
- developing both the proposed **Visual Arts** subject and a standalone **Painting** subject
- developing five subjects in the Technology Learning Area, noting that the final subjects may differ in content and coverage to the initial proposal
- **Raranga** and **Whakairo** be deferred until decisions are made following development of parallel Te Marautanga o Aotearoa (TMOA) subjects **Raranga** and **Toi Whakairo**
- development of **Gagana Tokelau** and **Vagahau Niue** take place on a longer delivery timeline to allow sufficient time to work closely with experts in the relevant Realm countries
- deferring **English as a Second Language**, **Comparative Language**, **Applied Mathematics**, and **Science** until after the current Review of Achievement Standards to allow for further scoping work
- deferring **Māori Studies** until after the current Review of Achievement Standards to ensure mātauranga Māori is first woven meaningfully throughout all NZC subject.

The summary table shows the final NZC subject list, and a more detailed analysis of and rationale for the final list of subjects follows.

The New Zealand Curriculum Final Subject List

Learning Area	Current Level 2/3 Subjects	Proposed Level 2/3 Subjects	Final Level 2/3 Subjects	For Possible Future Development (TBC)
Te Reo Māori ¹	Te Reo Māori	Te Reo Māori	Te Reo Māori	--
English The Arts	English	English	English	
	Art History	Art History	Art History	
	Dance	Dance	Dance	
	Drama	Drama	Drama	
	Music	Music Creation ^	Making Music ²	
		Music Representation ^	Music Studies ³	
	Te Ao Haka	Te Ao Haka	Te Ao Haka	
	Design	Design	Design	
	Photography	Photography and Film ^	Photography and Moving Image ^4	
	Printmaking	Visual Arts ^	Visual Arts ^	
	Sculpture			
Painting		Painting		
<i>New subjects</i>	Mau Rākau ^	Mau Rākau ^		
	Raranga ^	--	Raranga ^	
	Whakairo ^	--	Whakairo ^	
Health and Physical Education	Health	Health	Health	--
	Home Economics	Food and Nutrition ^	Food and Nutrition	
	Physical Education	Physical Education	Physical Education	
	<i>New subjects</i>	Outdoor Education	Outdoor Education	
		Whaiora ^	Whaiora	
Learning Languages	Bahasa Indonesia	--	--	
	Cook Islands Māori	Cook Islands Māori	Cook Islands Māori ^	

^ Provisional name. Final determination on subject name to be made through the Subject Expert Group development process.

¹ Te Reo Māori is not a Learning Area in the NZC. However, we have listed it separately to denote its importance and for consistency with the NCEA Level 1 subject list.

² Reverting to current name for now. Little support for a new name, and some confusion about what the subject would entail.

³ Reverting to current name for now. Little support for a new name, and some confusion about what the subject would entail.

⁴ New provisional name to reflect subject content. **Film** caused a lot of confusion in the sector, including negative feedback from **Media Studies** teachers who are concerned that the subject would encroach on **Media Studies**.

	French	French	French	
	Gagana Sāmoa	Gagana Sāmoa	Gagana Sāmoa	
	German	German	German	
	Japanese	Japanese	Japanese	
	Korean	Korean	Korean	
	Latin	--	--	
	Lea Faka-Tonga	Lea Faka-Tonga	Lea Faka-Tonga	
	Mandarin	Mandarin ^	Mandarin ^	
	New Zealand Sign Language	New Zealand Sign Language	New Zealand Sign Language	
	Spanish	Spanish	Spanish	
<i>Confirmed new subjects</i>	Gagana Tokelau	Gagana Tokelau		
	Vagahau Niue	Vagahau Niue		
<i>New subjects</i>	Comparative Language ^	--	Comparative Language ^	
	English as a Second Language ^	--	English as a Second Language ^	
Mathematics and Statistics	Mathematics and Statistics (Level 2)	Calculus (Level 3) Statistics (Level 3)	Mathematics Statistics	--
	<i>New Subject (Level 3)</i>		Applied Mathematics (Level 3) ^	Applied Mathematics (Level 3) ^
Science	Agricultural and Horticultural Science	Agricultural and Horticultural Science	Agricultural and Horticultural Science	--
	Biology	Biology	Biology	
	Chemistry	Chemistry	Chemistry	
	Earth and Space Science	Earth and Space Science	Earth and Space Science	
	Physics	Physics	Physics	
<i>New subject</i>	Science ^	--	Science ^	
Social Sciences	Accounting	Accounting	Accounting	--
	Business Studies (including Agribusiness)	Agribusiness	Agribusiness	
	Classical Studies	Business Studies	Business Studies	
	Economics	Classical Studies	Classical Studies	
	Education for Sustainability	Economics	Economics	
	Geography	Environment and Societies ^	Environment and Societies ⁵	
	History	Geography	Geography	
	Media Studies	History	History	
	Psychology	Media Studies	Media Studies	
	Religious Studies	Psychology	Psychology	
	Religious Studies	Religious Studies		

⁵ Keeping provisional name for now as subject requires refocusing and rebranding. Final name to be determined by Subject Expert Group during subject development.

Technology	Social Studies <i>New subjects</i>	People and Societies ^ Māori Studies	Social Studies ⁶ --	Māori Studies ^ --
		Pacific Studies	Pacific Studies	
		Tourism	Tourism	
	Design and Visual Communication	Design and Visual Communication	Design and Visual Communication ^	
	Digital Technologies	Designing and Developing Digital Outcomes	Digital Technologies ^	
	Computational Thinking ^	Computer Science ⁷		
Construction and Mechanical Technologies	Materials Technology	Materials Technologies ^		
Processing Technology	Processing Technology	Processing and Systems Technologies ^		
Generic Technology	--	--		
Totals	50	62	56	7

⁶ Reverting to current name for now. Little support for a new name, and some confusion about what the subject would entail.

⁷ The name **Computer Science** shows a clearer pathway to further education and employment and is a clearer articulation of the subject's intent. This also aligns with subject names in international qualifications.

Recommendations and Rationale by Learning Area

Learning Area 1: English

English is the study, use, and enjoyment of the English language and its literature, communicated orally, visually, and in writing, for a range of purposes and audiences and in a variety of forms.

Recommendations

We do not recommend any changes to the proposal to continue offering a single subject in the English Learning Area. This means that we will offer one subject with 20 credits (4 achievement standards) at Level 2, and one subject with 20 credits (4 achievement standards) at Level 3.

Rationale

49.4% of those completing the English survey questions either agreed or strongly agreed that the single English subject covers all the significant learning that should be available in the English Learning Area. The remainder disagreed or strongly disagreed (19.6%) or were neutral (31%).

However, of the respondents who made comments about English, over 35% (n=43) wanted to see English split into two subjects (English Language and English Literature), while only 14% of those who commented favoured a single English subject.

Respondents who commented about the study of language wanted ākonga to have the opportunity to develop their writing skills to a professional level. Parents were particularly likely to raise this. The Ministry believes a single English subject best supports literacy, with other relevant aspects of literacy woven throughout NCEA subjects. The new corequisite literacy unit standards will further support teaching and learning. Other considerations included the risk that a standalone literacy subject would duplicate the significant learning of the recommended ESOL subject and increase the risk of unofficial streaming practices in schools.

Keeping one subject is both possible (in terms of the NCEA Change Package) and desirable (for equity, coherence, and pathways). The English Subject Expert Group (SEG) is working to ensure that the design of English achievement standards across all NCEA levels will accommodate a diverse range of texts, modes, and media. Decisions on genre, and the degree of focus on literature, will be left to schools and kura to decide at the local curriculum level, as is currently the case.

Several respondents in favour of two English subjects drew comparisons with other Learning Areas or subjects, noting for example that Mathematics and Statistics will have three subjects at Level 3, while English will only have one. The reduction in credits and achievement standards available elicited similar comments.

The most common theme in comments about English course design was about making the study of English an attractive, useful, and interesting choice that supports ākonga through NCEA and beyond school into education and employment. We are confident that the development of English teaching and learning resources will address this feedback.

Learning Area 2: The Arts

In the Arts, ākonga explore, refine, and communicate ideas as they connect thinking, imagination, senses, and feelings to create works and respond to the works of others.

Recommendations

We recommend confirming 10 of the proposed subjects, while also making key changes to the proposal for a single Visual Arts subject through the reintroduction of a separate **Painting** subject.

This means that we will offer 11 subjects in the Arts Learning Area: **Art History, Dance, Design, Drama**, two **Music** subjects, **Photography and Moving Image, Painting, Te Ao Haka, Visual Arts**, and one new subject, **Mau Rākau**

Further scoping and design work are recommended for the two remaining proposed new subjects **Raranga** and **Whakairo**. This means that for now we recommend deferring these subjects.

The total number of achievement standards and credits available in The Arts will decrease from 54 achievement standards, 265 credits at Level 2 and 57 achievement standards, 302 credits at Level 3, to 220 credits and 44 achievement standards at both Levels 2 and 3.

Rationale

36.1% of survey respondents agreed that the proposed 12 subjects within the Arts Learning Area, including three new subjects, cover all significant learning that should be available in the Arts at NCEA Levels 2 and 3. Those who disagreed, 49.5% of respondents, linked their disagreement to the proposed Visual Arts subject, and the perceived loss of specialised subjects for Painting, Printmaking, and Sculpture. This level of disagreement was higher than in any other Learning Area and makes the Arts the only Learning Area in which total overall disagreement was higher than agreement.

We received significant feedback on the subject proposals for the Visual Arts, Photography and Film, and the two music subjects. Each of these will be discussed in more detail below.

Visual Arts

We recommend offering four subjects within the visual arts: **Photography and Moving Image, Design, Painting, Visual Arts**.

Confirming the visual arts subject(s) has required consideration of a range of factors such as:

- supporting the long-term sustainability of teaching and learning in a range of art forms that draw on contemporary, traditional, and indigenous bodies of knowledge and skills
- ensuring that the subject supports ākonga to deepen learning in specific art forms while also potentially exploring a broader range of art forms within the subject
- structuring the subject to support equitable outcomes (e.g. so perceived breadth or depth of study are valued equally)
- developing resources for mixed art form and single art form programmes; and
- enabling opportunities for professional development (e.g. where teachers want/need to upskill to deliver **Whakairo** or **Raranga**).

We recommend developing a **Photography and Moving Image** (previously, Photography and Film) subject in which ākonga develop their knowledge of photography and/or film techniques, think critically about still and moving image, and work creatively to express themselves. Schools can choose to offer photography and/or film courses depending on factors such as ākonga interest, resourcing and capability.

We recommend a new provisional name **Photography and Moving Image**. Moving image is already an important part of NCEA Photography courses, and there is still a need to ensure that students who present portfolios which use moving images or short film can be credentialed. This name-change addresses feedback that having 'film' in the subject title could lead to confusion over how it differs from Media Studies which includes a film-making component.

Several respondents wondered whether **Design** (from the Arts) and Design and Visual Communication (from Technology) were sufficiently different to exist as standalone subjects. In **Design**, ākonga explore, refine, and communicate their own artistic ideas, while the design aspect of **Design and Visual Communication** entails creating workable solutions to a problem or opportunity, using product and spatial design processes. These established subjects complement one another; they remain distinct in terms of their objectives, significant learning, and foci.

The Ministry received considerable feedback about the proposal to offer a single **Visual Arts** subject that would allow for the continued teaching and learning of **Painting**, **Printmaking**, and **Sculpture**. Feedback highlighted:

- the importance of **Painting** as an entry point to, and pathway, through the arts for students in low-decile environments
- the importance of **Printmaking** to Pacific students, who use this medium to explore cultural artforms and knowledge
- concerns about the possible implications for visual arts staffing and specialist capability.

The Ministry's objective for proposing a single Visual Arts subject was to foster opportunities for ākonga to explore, refine and communicate artistic ideas through a single art form or a combination of art forms. The proposal was intended to support **Painting** (a flourishing subject) while also bolstering **Printmaking** and **Sculpture** which are not feasible as standalone subjects due to low student numbers. In addition, we wanted to future proof the visual arts in schools by offering a subject that is flexible enough to cater to new and emerging art forms.

We believe these objectives can be achieved by developing the single **Visual Arts** subject and a standalone **Painting** subject. This recommendation balances the need to future-proof the visual arts, to develop subjects with sustainable student numbers, to ensure equity for ākonga in low-decile environments, and to support the integrity of **Painting** as an art form.

Schools will not have to teach all three art forms (painting, sculpture, and printmaking) within the single **Visual Arts** subject; there will be flexibility for schools to structure the subject to reflect ākonga interest and teacher capability. To maintain the integrity of the qualification, ākonga will not be able to use the same **Painting** portfolio to receive credits in both subjects.

Some of those who opposed the single **Visual Arts** subject also voiced concerns about **Raranga** and **Whakairo** being developed as standalone subjects. These respondents expressed concerns that a lack of sector capability and resourcing could mean these new subjects will suffer from low uptake and usage, similar to **Printmaking** and **Sculpture**.

We acknowledge that introducing **Raranga** and **Whakairo** would require resourcing and time to become established subjects. This is justified because it strengthens NCEA by supporting NCEA Change 2 *Mana ōrite mo te mātauranga Māori* by providing equitable access to a wider range of learning, particularly mātauranga Māori. As noted, decisions on development of these new subjects will take place on a different timeline, following the current Review of Achievement Standards.

Performing Arts

In principle, we continue to support offering two music subjects in the Arts Learning Area, to allow for a broad range of pathways for ākonga through NCEA and an appropriate level of specialisation. Survey respondents were in favour of two subjects (52.5%), and most of them wanted the split from Level 2 (51.3%). Feedback indicates that teachers however prefer the current 'split' in the music

strands between Making Music and Music Studies, rather than the proposed **Music Creation** and **Music Representation** subjects. For now, we recommend reverting to the current strand titles **Making Music** and **Music Studies**, with further refinement of the two subjects to be built into the development phase of the Review of Achievement Standards (RAS). This will allow us to develop two complementary and coherent music subjects in tandem and ensure adequate curriculum coverage. Each will contain aspects of the other, but the emphasis will be different. We anticipate this may lead to new names for these subjects, as NZQA data on achievement standard usage indicates that a split between a performance and composition subject (Making Music), and a theory and musicology subject (Music Studies), is unlikely to cater to ākonga needs and pathways.⁸

Respondents supported the proposal to develop the Performing Arts subject **Mau Rākau** (59.8% in favour, n = 735). Some did however argue that this subject, along with **Te Ao Haka, Raranga** and **Whakairo**, should be grouped under 'te ao Māori' or 'toi Māori', not the Arts. There was also concern that these new subjects were displacing **Painting, Printmaking, and Sculpture**, and that current teachers of **Printmaking** and **Sculpture** would be tasked with delivering these new subjects. Some respondents also felt that **Mau Rākau** was more suited to the Health and Physical Education Learning Area.

Respondents were broadly supportive of developing Mau Rākau and Whakairo across both curricula citing equity of access as an issue of primary importance:

It is the birthright of our ākonga Māori to access this mātauranga Māori regardless of which curriculum their school is following. These are both kaupapa that are strongly linked to Māori identity, so they need to be offered throughout the motu.

I think it would be amazing to offer all students of NZ the opportunity to take these subjects. A great way to continue the revival of Te Ao Māori.

Te Ao Haka, Dance, and Drama received no significant feedback. This was somewhat expected as these are well-established, popular, and coherent existing subjects. One respondent suggested that **Dance, Drama, and Music** could be used to support a musical theatre programme. This is already possible with the existing achievement standards for these subjects and will remain so since schools can engage in local curriculum design.

Lastly, we continue to recommend the development of **Art History** at NCEA Levels 2 and 3. No significant feedback was received on this proposal, but we know from prior public engagements and NZQA data that there is a strong demand, and support, for this subject.

⁸ The most common combinations of achievement standards for ākonga doing music at both Levels 2 and 3 are two performance achievement standards plus one of either the composition or song-writing achievement standards. Research and musicology achievement standards are also found in common clusters. However, theory-heavy achievement standards, and achievement standards which are perceived as more difficult achievement standards such as the aural external, seldom are used.

Learning Area 3: Health and Physical Education

In Health and Physical Education, ākonga learn about their own well-being, and that of others and society, in health-related and movement contexts.

Recommendations

We recommend confirming the subject proposals. This means that we will develop five NCEA Level 2 and 3 subjects within the Health and Physical Education Learning Area:

- **Health**
- **Physical Education**
- **Food and Nutrition**, a refocusing of **Home Economics**
- **Outdoor Education** as a new standalone subject; and
- **Whaiora** as a new subject.

The total number of credits available in Health and Physical Education will increase from 88 at Level 2 and 87 at Level 3, to 100 at both Levels 2 and 3. The total number of achievement standards will decrease by 1 (from 21 to 20) at Level 2 and remain the same at Level 3 (20).

Rationale

72.2% of survey respondents to the Health and Physical Education questions agreed that the proposed five subjects, including two new subjects, cover all significant learning that should be available in the Health and Physical Education Learning Area.

Significant feedback was received on the subject proposals for **Food and Nutrition**, **Outdoor Education** as a standalone subject, and **Whaiora** as a new subject.

Food and Nutrition

Food and Nutrition drew quite a few explicit mentions in survey responses, but most comments were brief, and either neutral ('Our school already refers to Home Economics as Food and Nutrition which then leads on (from year 11) to Catering and Hospitality'), or positive ('Very happy with the name change for Home Economics to Nutrition and Food. Its [sic] been a long time coming'). 76.4% of survey respondents supported the name change and refocusing of the subject. While the majority favoured keeping it as a standalone subject, some wondered whether it could be delivered as a topic within **Health**.

Those against the proposal to rename and refocus **Home Economics** as **Food and Nutrition** were in the minority (9.1%) and appeared to support a more traditional subject focus (e.g. '*Home Economics should remain named as such, and not only include Food and Nutrition but also budgeting and running a household!*') We believe that the traditional approach does not serve the needs of learners, and limits pathways to the world of work and further study. Other concerns included a perceived loss of practical aspects of **Home Economics**, and whether **Food and Nutrition** would better sit within the Technology Learning Area. The refocused subject **Food and Nutrition** should provide stronger links to both the Science and Technology Learning Areas, but also a reduced emphasis on food preparation, which we believe is better supported by industry skills standards.

Outdoor Education as a new stand-alone subject

The proposal to develop **Outdoor Education** as a standalone subject received overwhelmingly positive feedback, with 78.1% in favour. This subject also received more industry submissions than any other subject. A few respondents nevertheless raised concerns about equity and resourcing

issues that may prevent schools from delivering this subject. Some also wanted to retain unit standards, as they felt these appealed to ākonga thanks to their more practical focus.

Whaiora as a new subject

The proposal to develop **Whaiora** did not receive much feedback but gained general approval (65.3% in favour, n = 538) from those who responded to questions about the Health and Physical Education Learning Area. Some of these respondents noted that the description of the proposed subject, as outlined in the NZC Discussion Document, did not allow them to fully understand its scope and coverage.

A few concerns were also raised about the possibility of **Whaiora** duplicating learning already available in **Health**, and of the risk of segregating mātauranga Māori from **Health**, rather than weaving it through all subjects. For example, one respondent felt that:

dividing up Health concepts into a Moari [sic] based lens approach will give the opportunity for the school to place it in the too hard basket and not use these standards. A more integrated approach would be to have one matrix for Health/Whaiora that combines these approaches so there is no choice. Integration of Te Ao Maori concepts does not mean dividing it up. I see this as separation rather than integration.

On balance, we recommend developing **Whaiora**, while acknowledging the need for further scoping and design work to ensure the subject is grounded in a coherent body of knowledge distinct from **Health**.

Existing subjects

Existing subjects **Health** and **Physical Education** did not receive significant feedback. Where these subjects were mentioned, it was to query whether the new subjects **Whaiora** (for **Health**) and **Outdoor Education** (for **Physical Education**) would risk duplicating significant learning in these existing subjects.

Learning Area 4: Learning Languages

In Learning Languages, ākonga learn to communicate in an additional language, develop their capacity to learn further languages, and explore different world views in relation to their own.

Recommendations

We recommend confirming 13 of the proposed language subjects, with the remaining two subjects to be deferred. This means that we will offer 15 subjects from NCEA Level 1 in the Languages Learning Area. These are made up of:

- 11 existing subjects – **French, Gagana Sāmoa, German, Japanese, Korean, Lea Faka-Tonga, Mandarin, New Zealand Sign Language, Spanish, Te Reo Māori, and Te Reo Māori Kūki 'Airani**
- two confirmed new subjects – **Gagana Tokelau and Vagahau Niue**
- two recommended new subjects – **Comparative Language and English as a Second Language** to be deferred.

The total number of achievement standards in Learning Languages will decrease from 62 to 52 at both Levels 2 and 3, while the total number of credits available will decrease from 286 credits at Level 2, and 287 credits at Level 3, to 260 credits at both.

Rationale

58.1% of survey respondents agreed that the proposed 15 language subjects cover all significant learning that should be available in Learning Languages.

No significant feedback was received on existing language subjects, **French, Gagana Sāmoa, German, Japanese, Korean, Lea Faka-Tonga, New Zealand Sign Language, Spanish, and Te Reo Māori Kūki 'Airani**. Where these subjects were mentioned, it was in the context of facilitating ākonga access to as many of the different languages as possible. While we are committed to equitable resourcing of all subjects, the actual offerings of individual schools come down to local curriculum design.

Mandarin

44.6% of respondents to the survey questions on the language learning subjects were in favour of keeping the name **Mandarin**, 15.1% against, while 40.3% neither agreed nor disagreed. In a separate survey engagement on draft Level 1 subject materials, we asked respondents to comment on proposed changes to Level 1 subject titles. One of these was **Mandarin**. Feedback in this parallel survey was strongly against keeping **Mandarin** as the subject name.

'Mandarin' remains however the most accurate English-language description for the spoken language that is taught in this NCEA subject. If we were to name the subject based on the script alone, it could be Simplified or Modern Chinese.

We acknowledge that, as with all language learning subjects, aspects of Chinese culture are incorporated into programmes of teaching and learning, but even these may come from outside of mainland China (e.g. it could include aspects of Taiwanese culture). To call the Chinese-language learning subject 'Chinese' alone, risks incorrectly suggesting that there is only one Chinese language, when linguists commonly refer to Chinese *languages*, which would include for example, Cantonese. Given the lukewarm response to the current name **Mandarin**, we will confirm any adjustments to subject names in the technical report.

Te Reo Māori

The proposal to continue **Te Reo Māori** did not receive significant feedback. Four respondents felt that the subject should be given its own Learning Area to reflect its equal status with **English**, while another two felt that it should be compulsory. A difficulty here is that in NZC **Te Reo Māori** is designed to meet the unique needs of second-language learners, and its relationship to Te Reo Rangatira, the parallel TMoA subject, which serves heritage and first-language speakers, means a delicate balancing act is required. Another suggested that we should make schools prioritise **Te Reo Māori, New Zealand Sign Language and English**.

Comparative Language

Feedback on **Comparative Language** was varied, with 54.4% in favour of its development as a new subject. Most respondents felt that the description of the proposed subject provided little or no clarity about its intent and purpose. For those who rejected the proposal, issues such as resourcing and capability were central, such as who would deliver the subject, and in what language. A related concern was who would be defined as a 'heritage' speaker of a language.

For those in favour of the proposal, an acknowledgement of the gap in language education for heritage or fluent speakers was important, as well as creating more equitable outcomes for second-language learners in existing language subjects by providing a more attractive option for credentialing the advanced knowledge of heritage language speakers.

The need for the proposed subject was further highlighted by the requests from survey respondents for other languages, particularly Hindi, Cantonese, Tagalog, Fijian, and Afrikaans. The Ministry currently has no plans to develop specific subjects for these languages so **Comparative Language** could provide a pathway for ākonga who have some background in these languages. However, we will need to continue to explore how achievement standards could support ākonga wanting to study more than one of these languages

Teachers of English to Speakers of Other Languages Aotearoa New Zealand (TESOLANZ) expressed its support for Comparative Language, stating that, '*as a new subject [...] it promises to provide an opportunity for community language knowledge to be recognised and affirmed in the NCEA context.*' This group suggested renaming the proposed subject as Language Studies 'to enable a broader approach in which language knowledge and use - as well as language comparison - could be recognised.'

Some respondents question whether the learning of ākonga who are already competent in two or more languages fits within this area of the curriculum. A few respondents wondered whether the course could be more context-neutral and focus on linguistics rather than a specific language.

At this time, we recommend deferring **Comparative Language**.

Gagana Tokelau and Vagahau Niue

Neither of these proposed new subjects received significant survey feedback. There were some mentions of Pacific languages as a group, and in a few of these cases, respondents noted that the small numbers of teachers and learners may make these subjects unsustainable. Gagana Tokelau and Vagahau Niue are confirmed for development on a longer delivery timeline to allow sufficient time to work closely with experts in the relevant Realm countries.

English as a Second Language

English as a Second Language received strongly positive feedback, with 78.9% in favour of its development as an achievement standard subject. Respondents recognised that this subject would help to provide equitable opportunities for ākonga from a variety of backgrounds, including recent migrants, refugees, and international students. Feedback also supported achievement standards for this subject to ensure pathways for ākonga into further study and employment, particularly if the

subject can be approved for UE. TESOLNZ also noted in their submission that 90% of its members surveyed in 2019 '*wanted achievement standards for ELLs in secondary schools and there is strong sector interest in the development of such standards.*'

Negative feedback related almost exclusively to the provisional name of the subject. Respondents felt that **English as a Second Language** is an outdated title, and most preferred the name **English as an Additional Language (EAL)**. We recommend reconsidering the name of this subject over the course of its development.

Scoping work prior to development will also need to account for the relationship of the proposed new subject with existing ESOL unit standards. **ESOL** will require a bespoke development process, involving its simultaneous development at all three levels of NCEA, similar to the approach taken with **Te Ao Haka** and planned for **New Zealand Sign Language**. At this time, we recommend deferring development of **ESOL**.

Latin and Bahasa Indonesia

Last year's decision to discontinue achievement standard support for **Latin** generated some negative feedback. This feedback which is out of scope for the current subjects under consideration.

One respondent felt similarly about the proposal to discontinue support for **Bahasa Indonesia**. Since this subject has not been used for many years, and is therefore even less sustainable than Latin, there is no reason to reconsider its removal.

Learning Area 5: Mathematics and Statistics

In Mathematics and Statistics, ākonga explore relationships in quantities, space, and data, and learn to express these relationships in ways that help them to make sense of the world around them.

Recommendations

We recommend confirming two of the proposed subjects. This means that for the Mathematics and Statistics Learning Area, we will offer two subjects from Level 2, **Mathematics** and **Statistics**, with an additional subject, **Applied Mathematics**, to be considered for future development at Level 3.

The total number of credits available in Mathematics and Statistics will increase from 42 credits across 15 achievement standards at Level 2, and 60 credits across 16 achievement standards at Level 3, to 2 subjects each with 4 achievement standards and 20 credits at both Levels 2 and 3.

Rationale

57.6% of survey respondents who answered questions about the Mathematics and Statistics Learning Area agreed that the proposed subjects cover all significant learning that should be available at NCEA Levels 2 and 3. 57.6% also supported the two-subject option from Level 2, while 61.8% supported the three-subject option at Level 3. Supportive submissions on the proposed suite of subjects in this Learning Area were also received from the Education Committee of the New Zealand Statistical Association (EDNZSA) and the New Zealand Association of Mathematics Teachers (NZAMT).

A significant theme in survey comments was financial literacy. We acknowledge the importance of financial literacy capabilities but believe the skills themselves should be integrated into relevant subjects, including **Mathematics** and **Statistics**, rather than existing as a standalone subject. We do not believe that financial literacy is, or should be, directly assessable.

Statistics

Respondents who disagreed with the proposal to split **Mathematics and Statistics** at Level 2 were mostly concerned that separating out **Statistics** from **Mathematics** at this level could mean ākonga miss important foundational learning, particularly those ākonga choosing to study **Statistics** alone. This suggestion appears to arise from the fact that current Level 2 Statistics courses, built using existing achievement standards, typically offer little algebraic content, which is essential to further study in statistics at a tertiary level.

A further issue raised was the risk of ākonga choosing one mathematics subject at Level 2, only to discover that they need both – or the subject they did not choose - at Level 3. Respondents felt the likelihood of this arising relates to the limited number of subjects a student can fit in their timetable.

To ensure that a standalone **Statistics** subject is coherent, and leads to further study and employment, we will ensure that algebraic thinking, and other key aspects of mathematics required for further study in statistics and mathematics are reflected in the subject's significant learning. While overlap in learning, especially theoretical learning is possible, we envisage **Mathematics** and **Statistics** will assess different learning in similar ways, or the same learning in different ways. Further design work, and close alignment of subject development, will be required to ensure that the two subjects, **Mathematics** and **Statistics**, do not overlap in terms of achievement standards and assessment.

Applied Mathematics

The Ministry recommends deferring development of an **Applied Mathematics** subject at Level 3. While survey feedback indicates broad support for the proposed subject, with 61.8% of survey respondents (n: 361), and 89.3% of respondents (n: 299) to a separate survey conducted by NZAMT,

in favour of an Applied Mathematics subject at Level 3, there appeared to be little consensus across both surveys on what the subject should cover.

EDNZSA felt the new subject '*could allow kura to develop and strengthen options and pathways for ākongā, and to create meaningful and stimulating courses that weave mathematical and statistical ideas within personal and cultural contexts.*' But they did express concern that the descriptions of the proposed subject in the Technical Report and NZC Discussion Document suggest '*disconnected, specialised, technical topics that conveys no vision of applied mathematics in its real sense of applying mathematical techniques to solve real problems in the world outside of mathematics.*'

Perhaps this lack of consistent description is what led some survey respondents to assume that the **Applied Mathematics** subject would be practical in nature, with a focus on workplace skills and financial literacy. Others noted that the presence of 'applied' in the subject's title could lead to its being used to stream ākongā, despite the proposed subject content, which is theoretical and at least as difficult as the proposed **Mathematics** and **Statistics** subjects. EDNZSA concur, stating that Applied Mathematics as a title '*has historical baggage at high school level, often being the name for lower-level courses.*'

A small group of respondents indicated that they would like to see **Applied Mathematics** at Level 2. However, this was mostly in the context of a subject for ākongā who may struggle with mathematics, which is not in line with our proposal. The Ministry does not support the development of subjects which may disadvantage ākongā by limiting their pathways to further study - all subjects should be designed to meet the needs of all ākongā. Ākongā who are not working at curriculum level 7 in the Mathematics and Statistics Learning Area should in most cases be working towards completing NCEA Level 1 Mathematics and Statistics, possibly in a mixed-level class. Those who have achieved those standards should be prepared enough to begin Level 2 Mathematics or Statistics.

Mathematics

Some respondents worried that the proposed **Mathematics** subject at Level 3 would no longer include Calculus. This was not the intention of renaming the subject, which will continue to include a strong Calculus component. We recognise that Calculus is important for many tertiary pathways including engineering, medicine, and pure mathematics courses.

Learning Area 6: Science

In Science, ākonga explore how both the natural physical world and science itself work so that they can participate as critical, informed, and responsible citizens in a society in which science plays a significant role.

Recommendations

We recommend confirming five of the proposed subjects. This means that for the Science Learning Area we will continue to offer five subjects: **Agricultural and Horticultural Science**, **Biology**, **Chemistry**, **Earth and Space Science**, and **Physics**. We do not recommend progressing proposed new subject **Science** at this time.

The total number of achievement standards and credits available in Science will decrease from 45 achievement standards (174 credits) at Level 2 and 38 achievement standards (155 credits) at Level 3 to 20 achievement standards (100 credits) at both Levels 2 and 3.

Rationale

65.1% of survey respondents agreed that the proposed six Science subjects, including one new subject, cover all the significant learning that should be available in the Science Learning Area. As no changes to the existing subjects were proposed, beyond those outlined in the NCEA Change Package, we believe this indicates a significant level of support for the status quo, but also a willingness to explore the need for a new subject within the Learning Area.

A further theme arising from the survey feedback on the Science Learning Area was dissatisfaction with the level of detail provided in the NZC Discussion Document, especially about the provisional content for existing subjects. This seems to have translated into suggesting specific content for subjects, such as marine science, aquaculture, and human biology.

Agricultural and Horticultural Science

The recommendation to keep **Agricultural and Horticultural Science** as a single subject drew minor opposition in survey feedback (7.4% against, n = 409). Respondents who believed the subject should be split provided rationales we have previously explored, such as the importance of agriculture and horticulture to Aotearoa New Zealand's economy. As noted in the NZC Technical Report, the special place occupied by these industries did lead, early on in subject list development, to consideration being given to separating Agricultural and Horticultural Science into two subjects, Agricultural Science and Horticultural Science.

However, the concern then, as now, is that one or both subjects may not be sustainable, given ākonga numbers across the combined subject remain low, especially in terms of enrolment and entry in coherent courses (14 or more credits at NCEA Level 2 or 3).

Science as a new subject

65.3% of respondents to the Science Learning Area questions were in favour of a 'nature of science' subject at NCEA Levels 2 and 3. Those who commented suggested that the proposed new subject would enable ākonga choice and interdisciplinary exposure.

While only 16.9% disagreed with the proposed subject, these respondents, as well as those in favour, raised several important concerns about the proposed **Science** subject. First, that the new subject would be promoted to lower-ability students, irrespective of the Ministry's intent. Second, that 'nature of science' learning would be removed from specialist subjects such as **Biology** and **Physics** to create a coherent body of knowledge for the new subject to cover, leading to fragmented or diminished learning outcomes for ākonga on different pathways.

The converse of this was also suggested, namely that the new **Science** subject would duplicate learning in specialist subjects, with a particular risk signalled for **Earth and Space Science**. Respondents who self-identified as teachers questioned whether the proposed subject aimed to extend disciplinary epistemic knowledge for ākonga specialising in one or more sciences or provide a foundational level of scientific literacy for ākonga on a non-science pathway. This second option has merit but is inconsistent with the policy objective of providing opportunities for increased specialisation at Levels 2 and 3 – unless it is developed as a specialised course in science communication. The first option may have an even less defined audience; extension is arguably the domain of Scholarship.

Either way, the risk of content duplication is significant. While **Science** would be developed to complement student pathways where science literacy is useful, for example in the humanities, it would also need to complement the pathways of ākonga wishing to specialise in a scientific discipline, as the subject can help link disciplinary knowledge to wider scientific issues and conversations. For these reasons, the Ministry does not recommend developing **Science** as a new subject at this time.

Learning Area 7: Social Sciences

In the Social Sciences, ākonga explore how societies work and how people can participate as critical, active, informed, and responsible citizens. Contexts are drawn from the past, present, and future and from places within and beyond Aotearoa New Zealand.

Recommendations

We recommend confirming 14 of the proposed subjects for the Social Sciences Learning Area, with one further subject, **Māori Studies**, deferred. The 14 subjects are:

- Nine existing subjects – **Accounting, Business Studies, Classical Studies, Economics, Geography, History, Media Studies, Psychology, and Religious Studies**
- **Education for Sustainability**, which will be refocused as **Environment and Societies**
- **Social Studies**, which will not be renamed as **People and Societies**, but will be refocused, with its name to be decided during subject development
- **Agribusiness**, which will be developed as a new standalone subject
- **Pacific Studies** and **Tourism**, currently supported by unit standards, will be developed as new subjects

The total number of achievement standards and credits available in the Social Sciences will decrease from 73 achievement standards (302 credits) at Level 2 and 69 achievement standards (305 credits) at Level 3, to 56 achievement standards (280 credits) at both Levels 2 and 3.

Rationale

65.8% of survey respondents agreed that the proposed 15 subjects, including 3 new subjects, cover all the significant learning that should be available in the Social Sciences at NCEA Levels 2 and 3.

Relative to other Learning Areas, and particularly in proportion to the greater number of subjects offered in it, the Social Sciences received a lesser amount of feedback through the survey.

Respondents who commented on specific subjects in this Learning Area tended to focus on the proposed new subjects. In addition, some respondents suggested that the Social Sciences Learning Area already offers too many subjects, while others questioned why philosophy is not offered as a standalone subject, given that it *'allows students to learn to think and express themselves clearly on a huge variety of topics.'* A small number of respondents expressed concerns about what the proposed subject changes will mean for Legal Studies, a unit standard course which, we note, will continue to be supported by unit standards owned by NZQA. Lastly, a number of respondents commented on Level 1 subject decisions (Media Studies, and Commerce-related subjects), which are out of scope.

Existing subjects

Respondents were supportive of **Accounting**, Agribusiness, **Business Studies**, and **Economics** as standalone, specialised subjects at Levels 2 and 3, but questioned whether the broad, foundational **Commerce** subject will adequately prepare learners to engage in these subjects. Another respondent wondered if we should give the 'commerce' subjects their own NZC Learning Area.

Likewise, a few respondents revisited the removal of **Media Studies** at NCEA Level 1, but the proposed continuation of the Level 2 and 3 standalone subject received overwhelmingly positive feedback.

Existing subjects **Classical Studies, History, Geography, Religious Studies, and Psychology** received few specific mentions. Some respondents questioned whether **Tourism**, and the refocused subject **Environment and Societies**, might duplicate significant learning in **Geography**. These concerns will inform the development of all three subjects, as we will need to ensure some alignment between the significant learning but also clear differentiations between these distinct bodies of knowledge.

Refocused subjects

The proposal to refocus **Education for Sustainability** as **Environment and Societies** received some negative feedback. Respondents also worried that the removal of 'sustainability' from the subject's title would result in a loss of focus on sustainable futures and activism.

Demand for the existing standalone subject is low. Anecdotal evidence suggests that ākonga who are interested in activism and/or sustainability do not take the subject. This is supported by NZQA data, which indicates that the number of ākonga undertaking the subject as a coherent body of knowledge are the exception. In 2018, for example, only 72 ākonga undertook 14 or more credits in the subject at Level 2. As some **Education for Sustainability** achievement standards were used by upwards of 400 ākonga, we have a pattern of usage where the existing subject's achievement standards are not being used as part of a dedicated course, even if some are possibly being included more frequently in integrated courses.

The subject we propose to develop, irrespective of its name, will still include a strong focus on sustainability, while also encouraging broader enquiries into the environment, resource usage, and the geopolitics of the environment, including international relations. This will strengthen its place within the Social Sciences Learning Area while also maintaining its interdisciplinary aspect, by encouraging ākonga to engage with scientific ideas. In these ways, the refocused subject will support ākonga to follow a variety of pathways beyond school or kura, for example, in industries needing to respond to climate change.

Negative feedback was also received in relation to the proposed name change for **Social Studies**. While some respondents acknowledged that the current name lacks parity of esteem with other social science subjects, they suggested that we should prioritise developing and resourcing the existing subject, rather than changing its name to **People and Societies**. A few respondents also suggested renaming the subject Sociology to align with tertiary and international subject naming conventions. We appreciate this desire for sector and international alignment but note that the content of both the current and proposed subjects remains distinct from sociology. The proposed subject will focus more explicitly on significant learning relating to culture, politics, citizenship, and social and political action, but it will not be a pure sociology course. We recommend keeping the subject name provisional until development work has progressed.

New subjects

Agribusiness received few explicit mentions, which is to be expected given that we did not ask questions about this subject specifically. We recommend developing this as a new standalone subject.

Feedback from the survey indicates overwhelming support for a **Māori Studies** subject (79.4% in favour). As noted, however, we recommend deferring this subject to best reflect Change 2 of the NCEA Change Package *Mana ōrite mo te mātauranga Māori* which commits us to weaving mātauranga Māori throughout all subjects. We believe that once other NZC subjects have been developed, the Ministry will be better placed to confirm what significant learning remains to be covered in a standalone **Māori Studies** subject, with its own discrete body of knowledge and clear subject boundaries. This will provide the opportunity to clarify, for example, how a **Māori Studies** subject would fit alongside and complement other new subjects derived from te ao Māori such as **Te Ao Haka**, **Raranga**, and **Whaiora**, and existing subjects including **History** and **Social Studies**. For example, one survey respondent assumed that we were proposing another history subject, which highlights the need to clarify the scope of the proposed **Māori Studies** subject, because its possible ambit is so wide

The Ministry's recommended approach of deferral is further supported by the sector's, and the wider public's, confusion over the proposed subject's scope, which suggests more design work needs to be completed, prior to considering development, to establish where a **Māori Studies** subject would fit within the Social Sciences specifically, and within NCEA more broadly.

The proposal to develop **Pacific Studies** as a new subject received overwhelming support (74.6% in favour, n = 626), including from the small number of respondents who commented directly on this proposal. One respondent summed up the need for this subject:

This is the opportunity of a life time to offer a subject that would make a huge impact in our fight against racism and discrimination whilst also opening doors to new avenues of learning. It is too good an opportunity to miss and so I implore you to please make Pacific studies a secondary school subject.

Respondents also hoped that the development of achievement standards for **Pacific Studies** will lead to its recognition as a UE subject. Feedback gathered during face-to-face, Ministry led engagements tended to emphasise the need for careful development and implementation of this subject, with meaningful and respectful engagement of and input from Pacific communities.

There was also strong approval for the proposal to offer **Tourism** as a new achievement standard subject. Most respondents, including Tourism Educators Forum Aotearoa (TEFA), and Tourism Industry Aotearoa (TIA), see achievement standards for **Tourism** as supporting better tertiary pathways for ākonga. They note that the proposal to develop a **Tourism** subject is a unique opportunity to increase the mana of Tourism, which often faces perception issues, and is not seen as a worthwhile or viable pathway, particularly for high-achieving students. As with **Pacific Studies**, respondents hoped that the development of achievement standards for **Tourism** will lead to its recognition as a UE subject. Such resounding approval and enthusiasm for what TIA describe as 'a quality and aspirational subject' is unsurprising since we have heard sustained and consistent support for this subject over the last few years. One respondent noted the importance of tourism to the Aotearoa New Zealand economy, despite Covid disruptions:

Given that Tourism was NZ's biggest export earner before Covid and is certain to reclaim this title once again in a few year's time [sic] it's vital this subject is not 'dumbed' [sic] down in schools. We need passionate young people who will be the future leaders attracted to this subject and we need parents to encourage their children to consider tourism as a subject in schools.

Some concerns were raised about the switch from unit standards to achievement standards, perhaps reflecting a view that unit standards are easier and more suited to some ākonga than achievement standards:

Having Tourism as an achievement standard subject is fantastic, but will industry unit standards still be available for use? Achievement standards will lead into Tourism at university level, however many of our current students do not go on to university, preferring to study tourism at other tertiary providers. I teach many students who would not cope with achievement standards in Tourism, and who will still require a unit standards course as an alternative.

A more pressing consideration for **Tourism** is the Reform of Vocational Education (RoVE). Policy work will need to be done to determine the relationship between **Tourism** as an achievement standard subject, and Workforce Development Council (WDC) unit standards designed to credential learning in tourism. At this stage, it is not anticipated that this work will lead to significant delays in delivering a **Tourism** subject.

Learning Area 8: Technology

Technology is intervention by design. This Learning Area is about using intellectual and practical resources to create technological outcomes, which expand human possibilities by addressing needs and realising opportunities.

Recommendations

Key changes to the subject recommendations, following expert advice from the Royal Society Te Apārangi and public engagement, are:

- Refocus the proposed **Design and Visual Communication (DVC)** subject to align with the Design in Technology proposal from the Royal Society Te Apārangi. This emphasises the future-orientation of the subject, already present in many DVC classrooms throughout the country, towards using technology to create and present product and spatial designs.
- Create two '**development in technology**' subjects, one focused on Materials, the other on Processing and Systems, aligned respectively to the Waihanga Ara Rau Construction and Infrastructure WDC and the Hanga-Aro-Rau Manufacturing, Engineering and Logistics WDC.
- Change the name of the proposed subject **Computational Thinking to Computer Science** to provide clearer pathways into further study and employment.
- Confirm subject names for the Technology Learning Area during subject development.

This means that for the Technology Learning Area we will offer five subjects:

- **Design and Visual Communication (DVC)**
- **Materials Technology**
- **Processing and Systems Technologies**
- **Digital Technologies**
- **Computer Science**

The total number of achievement standards and credits available in technology will decrease from 41 achievement standards (174 credits) at Level 2 and 37 achievement standards (169 credits) at Level 3, to 20 achievement standards (100 credits) at both Levels 2 and 3.

Rationale

56% of survey respondents (n = 548) were in favour of the proposed five-subject option, based on each of the five strands of the Technology Learning Area. They agreed with the statement that these five subjects 'cover all the significant learning that should be available in Technology'. Only 20.5% disagreed, and the remainder neither agreed nor disagreed. This indicates that respondents were broadly comfortable with how the 5-subject proposal supports NZC derived learning, which is something we expected based on discussions with Technology teachers.

The responses to the question 'I think offering three subjects (Design in Technology, Development in Technology, and Digital Technology) will provide better learning outcomes than the five subject proposal above' paralleled this. Here, the disagree/strongly disagree (51.8%) group was similar in size to the agree/strongly agree group in favour of the five-subject option. Respondents in favour of the five-subject option and/or against the three-subject option seemed to equate the number of subjects in the Technology Learning Area to the degree of specialisation.

Several respondents recognised the flexibility of a three-subject option. Voicing their support for the three-subject option, one respondent articulated the intent of this proposal:

Taken that there will be industry standards offered for specialist areas such as construction, engineering, and food, it would be better to streamline the technology standards into Design, Develop, and Digital which would give another more academic pathway for students that wanted to go further than a trade certificate.

The three-subject option also coincides with the approach proposed by the Royal Society Te Apārangi in their July report on improving teaching, learning and assessment of Technology and Hangarau within NCEA and the secondary-tertiary education system. The Panel's advice is in favour of broad-based technology education, which it argues aligns with the goals of Aotearoa New Zealand to be a nation of world-leading innovators. It recommends changes to emphasise technological literacy rather than technical education.

This report played a key role in reaching our recommended five-subject approach, despite recommending more subjects than the Royal Society Te Apārangi did. Broadly, we have recommended more subjects because offering only one **Development in Technology** subject, with four standards (20 credits) at each level, is unlikely to cover all the technological areas supported by the NZC and currently assessed through the technology matrices.

Survey respondents who favoured five subjects were concerned about opportunities for ākonga who wish to take both processing (for food technology) and materials (for textiles and resistant materials). NZQA data shows that students rarely use achievements standards from both, and instead rely heavily on unit standards, which will continue to be available whether one or two development in technology subjects are offered.

Standard usage data shows that outside of **DVC** and **Digital Technology** there is very little consistency in which standards within the Technology Learning Area are used. In many cases this reflects individualised learning programmes, assembled from the large number of standards available, including the many generic standards. However, there is also a substantive risk that technology students can take courses which exclude significant learning, particularly the highly conceptual content contained in the externally assessed standards, resulting in weakened pathways to further education and employment.

Design and Visual Communication (DVC)

We received little feedback on this subject, although some respondents did question its place in the Technology Learning Area. A concern about the subject's perceived overlap with Design (in the Arts) was also raised. To clarify the subject's focus, we considered renaming it as Design in Technology (the name proposed in the Royal Society's report). On balance, we recommend keeping the name **Design and Visual Communication**, but remain open to considering other possibilities, such as Spatial and Product Design, during the subject's development.

Materials Technologies and Processing and Systems Technologies

We recommend developing two subjects to support the existing areas of teaching and learning **Materials Technologies** and **Processing and Systems Technologies**. These subjects will be developed in parallel to ensure coherence and equivalence in their coverage of technological practice, technological knowledge, and nature of technology content.

Developing these two subjects will improve opportunities for specialisation by creating a more coherent framework around which to build courses. In addition, **Processing and Systems Technologies** will provide flexibility for teaching and learning across technological contexts as diverse as food and electronics. It will also signal clearly to the sector that specialised vocational learning is best served through coherent packages of achievement standards and industry skills standards rather than generic technology achievement standards. This will support students to navigate the school-industry interface and prepare them for a variety of pathways.

This recommendation to refocus both subjects is further supported by the fact that existing Processing Technology achievement standards are not currently well used. The exception is one achievement standard, used in isolation, which is combined with Home Economics, and unit standards, to create food technology courses. With the refocusing of Home Economics as Food and Nutrition, the need for this practice will reduce. For bespoke courses, including popular disciplines such as robotics and electronics, which schools will still be free to deliver, combinations of **Materials Technologies** and

Processing and Systems Technologies standards with digital technologies standards may be suitable.

Computational Thinking and Designing and Developing Digital Outcomes in Technology (DDDO)

60.2% of survey respondents supported a standalone **Computational Thinking** subject, but most suggested we change the name to **Computer Science** to align with tertiary and international naming conventions. Those against a standalone subject wondered whether a single Digital Technologies subject could offer a more coherent package of learning and support clearer pathways, where computational thinking is the 'back end' of DDDO. Notably, this was also raised in the Royal Society's report. The Ministry continues to recommend two digital technologies subjects.

Robotics and electronics were another significant theme in feedback on the digital technologies' subjects. Survey respondents appeared unsure as to where these would fit. As noted, we suspect that these specialised and resource-heavy courses will be taught using **Development in Technology (Materials and Construction)**, possibly in combination with **Computer Science**, **Mathematics**, and **Physics** achievement standards.