Initial report

Ministerial Advisory Group: Redesigning the English and Mathematics & Statistics learning areas in the refreshed New Zealand Curriculum for primary, intermediate and early secondary school students: Years 0 to 10

March 2024

Table of Contents

1. Introduction

Over the past two decades, New Zealand has witnessed declines in the educational achievement of its young people in reading, writing, and mathematics and statistics (hereinafter maths). As a result, a generation of young New Zealanders has been disadvantaged. These declines are evident in international studies such as PISA[1], TIMMS[2] and PIRLS[3]. New Zealand-based studies, including the National Monitoring Study of Student Achievement and recent trials of new literacy and numeracy co-requisites for NCEA, show that students tend to fall further and further behind curriculum expectations as they progress through schooling.

New Zealand also consistently shows high *variance* in educational achievement in international studies. That means, compared with most other developed countries, we have relatively large differences between our highest- and lowest-achieving students. High variance signals high educational inequality.

Declining achievement and high variance in the literacy and maths achievement of New Zealand's young people is attributable to a range of interdependent social forces. In education, our national curriculum has been weak in specifying the knowledge that students are entitled to have taught to them. Teaching practices have not kept pace with research from cognitive psychology and other disciplines – the science of learning. Details of ways in which teaching practice in each of reading, writing and maths has failed to reflect this body of research are explored in Appendix 1.

The work of the Ministerial Advisory Group (MAG) will strengthen the national curriculum and its supports by advising the Minister of Education on new curricula and teaching advice for literacy, English and maths. Foundational literacy and maths skills are essential to accessing the wider curriculum. Maths is also a tool for other subjects, such as physics, biology, chemistry and economics.

While teaching must be informed by science much more than it has been, learning should not be understood as a purely cognitive process. The craft of teaching involves bringing effective teaching practices to bear in classrooms populated by children from diverse cultures and with diverse needs. Children must feel welcome and safe if they are to learn in an optimal way.

Implementing the MAG's recommendations will not, by itself, cure New Zealand's educational woes. If its recommendations are successfully implemented, however, we can expect to see improvement in the foundational skills of literacy and maths in coming years.

1.1 Problem definition

Since the publication of the New Zealand Curriculum in 2007, the development of detailed curricula for New Zealand's schools has been devolved to schools themselves. This has resulted in too much inconsistency in what young people learn across schools. While *Te Mātaiaho - the refreshed New Zealand curriculum* goes some way towards greater specification of the knowledge that all New Zealanders should be taught, in literacy and English, the current documents still do not specify enough detail. In maths, the documents could be clearer. Furthermore, the current documents do not adequately sequence the content for teachers.

Teaching practice for literacy and maths in New Zealand's schools also requires attention.

In literacy, the 'Whole Language' and 'Balanced' approaches to literacy teaching leave too many students without enough proficiency in these fundamental skills for learning and life. Several decades of research in cognitive psychology and allied disciplines has shown that a more structured approach to teaching the key skills of reading and writing would be much more effective.

The research base for maths is more equivocal[4]. Even so, developments in understanding of working memory and cognitive load can contribute to improved teaching. Furthermore, teachers need more support with content knowledge and sequencing of maths teaching, especially in Years 0-8, where specialist maths teachers are not common.

Teachers need clear, knowledge rich and well sequenced curriculum documents, and sound teaching methods based on scientific evidence about how literacy and maths are best taught and learned. In this report, the MAG makes recommendations on the documents in its scope, to provide teachers with these much-needed tools.

1.2 Scope of the MAG

In this report, the documents in the scope of the MAG are reviewed and recommendations for amendments are made. In-scope documents, in accordance with the MAG's Terms of reference, include:

- *Te Mātaiaho - the refreshed New Zealand curriculum* (hereinafter Te Mātaiaho) for Years 0-10 in the English and Mathematics & Statistics learning areas.
- Draft *Common Practice Model* for literacy & communication and maths, including phase-by-phase guidance.
- Draft year-by-year sequence for maths.

All aspects of these documents are within the scope of the MAG review, except the *Understand, Know, Do* (UKD) structure of the learning areas.

According to the MAG's current Terms of Reference, the teaching sequences for literacy will be developed by the Literacy Contributors Group in collaboration with MAG members. Sample reading and writing teaching sequences for Years 0 to 3 are provided in the Appendix 3 of this report, to guide this process. The MAG will use the term *literacy* to refer only to reading and writing, including alternative modalities for these skills, such as braille.

The curriculum for Years 11-13 and the literacy and numeracy co-requisites for NCEA are outside the scope of the MAG. However, if the Minister approves the recommendations of this report, the MAG will refer to the co-requisites to guide the development of the curricula and common practice models for Years 1-10. It is important that the end-of-Phase 3 (Year 7-8) learning expectations reflect the knowledge and skills students need to achieve the co-requisite standards[i]. The end-of-Phase 4 (Years 9-10) learning expectations should similarly reflect the knowledge and skills students need to achieve Level 1 achievement standards in all learning areas.

1.3 The science of learning

In its Terms of Reference, the MAG has been tasked with reviewing the in-scope documents to "embed effective practices that reflect the science of learning". The 'science of learning' may be broadly construed as application of cognitive psychology in educational settings.

Cognitive psychology is the science of human information processing. It comprises a large research literature, compiled over many decades, on perception, memory, attention, language and motor functioning. This includes research on human motivation and the affective (emotional) factors that influence learning. It also includes research on conditions that affect learning, including dyslexia, dysgraphia, attention deficit hyperactive disorder, autism spectrum disorder and auditory processing disorder. The latter research base is important to ensure that teachers understand the implications of neurodiversity for their practice.

Another source of evidence contributing to the science of learning is literature on human development. Cognition, affect and motivation all develop and change during the process of human maturation. Choice of teaching approach should be shaped by knowledge of relevant developmental tendencies.

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[i] According to advice on the Ministry's TKI website, "The new NCEA Literacy and Numeracy standards sit at approximately Level 4/5 of the New Zealand Curriculum whereby a student has full control over Level 4 and is ready to work at Level 5" (https://e-asttle.tki.org.nz/Teacher-resources/e-asTTle-and-NCEA-co-requisite-readiness). That is approximately commensurate with Year 8 under current curriculum expectations.

1.4 Recommendations

The recommended changes to the in-scope document focus on aligning curriculum, teaching practice and assessment to improve the teaching and learning of literacy and communication, maths, and subject English. In accordance with the MAG's Terms of Reference, evidence from the science of learning has been brought to bear to the greatest extent possible.

The recommendations are collated here for easy reference. Detail on each can found in the sections numbered at the end of each recommendation.

It is recommended that the Minister:

1. Approves the amalgamation of the in-scope areas of Te Mātaiaho, the Common Practice Models and the teaching sequences into a single document (hereinafter referred to as 'amalgamated document'), issued as part of schools' curriculum regulatory requirements.
2. That the Common Practice Model and teaching sequences be issued as part of schools' curriculum regulatory requirements if Recommendation 1 is not approved.
3. Approves the removal of progress steps in favour of checkpoints for reading, writing, oral language and mathematics & statistics in the Common Practice Model or amalgamated document, and development of progress checkpoints integrated with the teaching sequences.
4. Approves either (1) the removal of the phase descriptions and outcomes; or (2) the definition of phases as high-level descriptors of UKD, with no explicit expectations for teachers' use of them.
5. Approves the MAG to develop a sequence, checkpoints and teaching methods for subject English.
6. Approves the MAG to revise the English and Mathematics & Statistics learning areas, to clarify the purposes of each domain of learning and subject, and to clearly define key terms.
7. Approves the MAG to restructure the English and Mathematics & Statistics learning areas, including condensing and clarifying the language of each, and delineating Reading, Writing, Oral language, English language and English literature.
8. Approves the MAG to include English language content within the literacy strands of the English curriculum up to Year 6 and to treat English language as a distinct strand from Year 7.
9. Approves the MAG to adjust the teaching sequence for Mathematics & Statistics to ensure disciplinary integrity and take account of cognitive load.
10. Approves the MAG to include sections in the Common Practice Model or amalgamated document describing key concepts from the science of learning and the use of formative feedback.
11. Approves the MAG to include in the Common Practice Model or amalgamated document for Literacy and Communication key theories of literacy acquisition.
12. Approve the MAG to include in the Common Practice Model or amalgamated document for Maths effective teaching practices informed by the science of learning.
13. Approves the MAG to include in the Common Practice Model or amalgamated document advice to teachers on using the progress checkpoints to monitor students' progress.

14. Approves the MAG to include in the Common Practice Model or amalgamated document a section on creating conditions for learning.
15. Approves the MAG to draft the in-scope documents for testing in schools and to be involved in the post-testing process.
16. Direct the Ministry of Education to work with the MAG to establish groups of additional experts to assist with the work of the MAG, as needed.
17. Direct the Ministry to establish a range of focus groups and contributor groups, including teachers, to provide feedback on draft documents prepared by the MAG, prior to wider consultation.

1.5 Overview of the report

Section 2 of this report lays out proposed revisions of the Common Practice Model, teaching sequences, and the in-scope learning areas in Te Mātaiaho, within its UKD structure, to create a single document. Recommendations are made based on these proposals. This section also includes a description of the ways in which these components are envisaged to work together. The proposals in Section 2 provide a design framework for the more detailed recommendations for revisions of the in-scope documents in Section 3.

Section 4 outlines and makes recommendations for a proposed process for preparing the revised documents. Additional resources that would be required are also identified here. Section 5 analyses risks and challenges associated with the implementation of the MAG's recommendations in schools.

In Appendix 1, ways in which the teaching of reading, writing and maths have not, in the past, reflected the science of learning are described. Ways in which the science of learning would be brought to bear on revisions of the in-scope documents are also explored here. Appendix 2 describes the standards of evidence that the MAG would use in drafting revised documents, noting that evidence of this sort does not exist for all aspects of the learning areas.

Detailed description of the contents of the proposed documents for each in-scope learning domain are presented in Appendix 3. As discussed and recommended in Section 2, these documents amalgamate elements of Te Mātaiaho, the teaching sequences and the Common Practice Model.

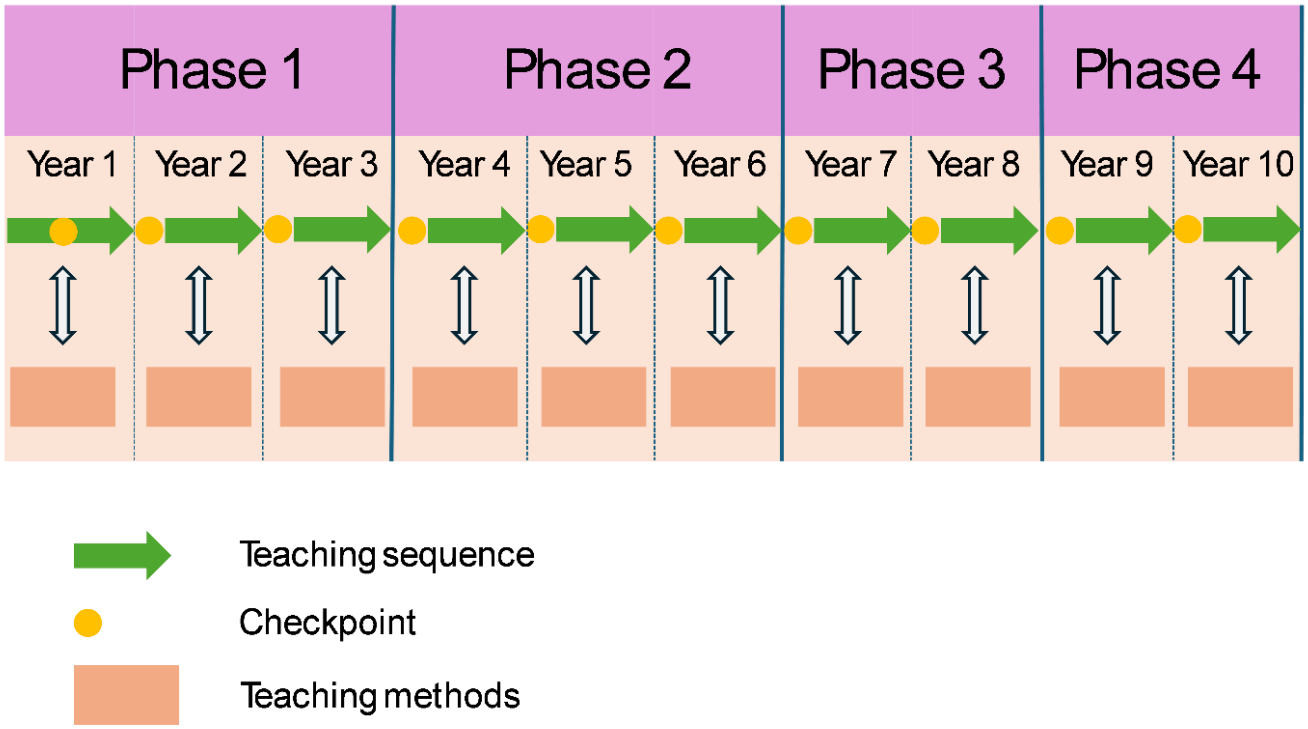
Appendix 4 comprises sample teaching sequences for reading and writing to guide the development of Literacy and Communication teaching sequences for Years 0-10.

2. Conceptualisation of the Curriculum Phases, teaching sequences and the Common Practice Model

A challenge in advising on the in-scope documents has been working out the relationships amongst the pieces and making sense of how they might work together for teachers. The documents were developed for different purposes on different timeframes, which has resulted in some confusing overlaps that need to be addressed for clarity. In order to simplify documentation and provide a single point of focus for teachers, students and families, the MAG recommends amalgamating them in one document (hereinafter referred to as 'amalgamated document'), to be issued as part of schools' curriculum regulatory requirements.

Under this conceptualisation, each learning domain (reading, writing and oral language) and subject (English and Mathematics & Statistics) includes a *teaching sequence* with associated *teaching methods* and *checkpoints* for diagnostic assessment. These replace the phase-by-phase guidance in the draft Common Practice Model. If the *phase descriptions* and *phase outcomes* in Te Mātaiaho are retained (see Section 2.2), these are also to be included.

The relationship between each of these components is depicted in the diagram below.



2.1 Teaching Sequences, Teaching Methods and Checkpoints

The current Common Practice Model contains guidelines on teaching practices. In the case of maths, there is also a detailed *teaching sequence*, currently in a separate document, that explains and orders the content to be taught in each year of schooling. The MAG advises that such a teaching sequence is likely to be a key support for teachers, and therefore an important part of improving progress and achievement. As noted above, sequences are currently under development for reading, writing and oral language.

The teaching sequences will enable teachers to teach elements of literacy and maths in an effective order. They must therefore provide enough detail to assist teachers' planning. They also have a role in guiding day-to-day formative assessment and feedback. Like the curriculum itself, the teaching sequences should be informed by principles of coherent and progressive curriculum design.

The sequences will also support students to establish robust cognitive schemas and minimise their experience of cognitive overload. The sequences should be prescriptive enough to serve this purpose, but not so prescriptive that teachers lose agency. The MAG recognises that teachers are creative in their work and must be responsive to the needs of their particular students. The sequence is therefore intended to be a support for effective teaching, not a straitjacket.

The *teaching practices* describe ways of teaching the content specified in the sequences based on the science of learning. The way in which the teaching practices relate to the content of the teaching sequences varies across learning domains. That is because the science of learning is better developed in some domains than in others (see Appendix 2 for details). For example, in maths, the science of learning provides general principles for teaching, but does not typically provide evidence strongly supporting specific methods for teaching particular content. On the other hand, the science of learning for reading and writing is much better developed and informs effective teaching methods of the subskills in each domain, especially in the early years of school.

For maths, then, most teaching practices will be similar for all elements of the sequence and may therefore appear prior to the sequence in the document, although some more specific practices will also be presented as specific guidance alongside the sequence. For reading and writing, related sequential steps on each sequence will be more explicitly linked to specific teaching methods. For these learning domains, presenting the sequences and teaching methods side-by-side will make explicit the connections between what to teach and effective means of teaching. This approach is illustrated in the sample literacy sequences in Appendix 4 of to this report.

There is an important consideration missing from the current materials: assessment. In particular, identifying students who are falling behind curriculum expectations is an important element of

teaching practice. While many teachers will identify such students in the course of day-to-day teaching, to ensure a systematic approach to this, the MAG believes that the Common Practice Model should include a mechanism for doing so. This mechanism is the *checkpoints* in the diagram.

The checkpoints denote points on each teaching sequence at which students should be assessed, to identify those who are making insufficient progress. This is to enable additional teaching and, when necessary, learning support beyond that provided by classroom teachers to be appropriately targeted.

The knowledge specified for each checkpoint should be derived from the relevant segment of the teaching sequences. It should be broad enough to encompass students' learning in an 'on-balance' way, with acknowledgement that students often progress through the specific elements of each sequence somewhat unevenly. Nonetheless, it is essential that students who fall behind curriculum expectations are identified before there are deleterious effects on their learning efficacy, and before catching them up becomes too difficult.

It is especially important to identify students who are making insufficient progress in reading, writing, oral language and maths in the early years of schooling. Accelerating students' progress is not straightforward and early identification of these students will be an important component of meeting the Government's target of 80% of Year 8 students meeting or exceeding curriculum expectations by 2030. Therefore, checkpoints should occur more frequently in the early years of schooling than in later years. The MAG recommends that the first checkpoint be situated six months after each student commences school, and that, thereafter, checkpoints be situated at the beginning of each school year, from Year 2. Situating checkpoints at the beginning of each school year would ensure that the teacher who collects these data will typically also be the teacher responsible for acting on them. The first checkpoint, after six months at school, is to ensure that students who have not developed crucial knowledge and skills required for them to make progress in reading, writing and maths are identified very early. Attention to such students at this early stage would help to ensure that more substantial learning delays do not eventuate.

The MAG believes that the data gathered from checkpoint assessments should be for classroom and school use only. It is not intended that checkpoint assessments be used for any purpose other than the identification of students at risk of falling behind curriculum expectations. Nonetheless, it might also be appropriate for schools to share assessment results with parents, and to use them to plan for

and allocate learning support resources. Risks associated with a formal assessment requirement, and ways to mitigate those risks, are discussed in detail in Section 5 of this report.

2.2 Curriculum Phases

The MAG recommends removing the progress steps from Te Mātaiaho and replacing them with checkpoints in a document amalgamating Te Mātaiaho, teaching sequences and teaching methods, as described above.

The roles of the *phase descriptions* and *phase outcomes* in the revised document have been debated by the MAG, although full agreement has not been reached. Some members are in favour of discarding them and others, of retaining them.

The main argument for discarding the phases and phase outcomes is simplicity. It is not clear that the phases will add anything to teachers' toolkit if the teaching sequences, teaching methods and checkpoints are in place. While the phases describe knowledge, concepts and skills that are to be taught to all students, the teaching sequences also fulfil this role, and in more detail. Similarly, while the phase outcomes describe what students are expected to have learned, the outcomes are not frequent enough or detailed enough to effectively guide diagnostic assessment. Checkpoints would fulfil this role in a more specific and timely manner. From this perspective the phases and phase outcomes might be seen as redundant.

The argument for retaining the phases and phase outcomes is twofold. The first is pragmatic – if they were to be abolished for the English and Mathematics and Statistics learning areas, these areas would be at odds with the other five curriculum learning areas, which, at this stage, retain them. It is beyond the scope of the MAG to offer advice on those learning areas.

The second, more substantive argument to retain the phases is that they support leaders of school curriculum design. In this regard, they could provide clarity about which parts of the curriculum serve what purpose.

The phase descriptions could deepen curriculum leaders' and teachers' understandings of each learning area and support the development of frameworks and selection of contexts for learning, through the 'big ideas.' From this perspective, their role might be to describe the nature of the knowledge to be taught in each curriculum phase. For example, the description for Phase 1 literacy and communication will emphasise foundational knowledge and cognitive processes for reading, writing and oral language (e.g., decoding skills for reading). At Phase 2, the emphasis will shift towards using these skills for deeper comprehension and expression. Similarly, an argument to retain the *phase outcomes* is to provide clear and broad statements of what students should know,

understand and be able to do by the end of each phase. Under this conceptualisation there would not be any specific assessment against the phase outcomes. Rather, they would guide curriculum leaders' and teachers' planning and reflection, and maintain attention on the broad landscape of learning.

The MAG sees three options for the phase descriptions and outcomes:

1. Exclude them from a combined document that includes teaching sequences, teaching methods and checkpoints. This would amount to abolishing the phase descriptions and outcomes for English and Mathematics & Statistics.
2. Treat them as high-level descriptors of the most important knowledge and skills represented at each phase (i.e., the 'Big Ideas'), with no explicit expectations for teachers' use of them.
3. Leave them as they are, with the phase outcomes implying a need for assessment. This option would only make sense if Recommendation 1, to amalgamate the in-scope areas of Te Mātaiaho, the Common Practice Models and the teaching sequences into a single document is rejected.

The MAG recommends that the Minister selects between Options 1 and 2 with cognisance of the implications of Option 1 for learning areas that are not in scope for the MAG.

2.3 Summary

The literacy and communication teaching sequences need to be developed prior to developing specific teaching methods. The existing maths sequence is largely adequate, but revisions are needed for some aspects to adjust difficulty and specificity. The teaching sequences, checkpoints, and aligned teaching practice would provide detail of the content and teaching practices necessary to improve the teaching of literacy and maths in New Zealand schools.

It will be important for Te Mātaiaho, the Common Practice Model and the teaching sequences to work together seamlessly, to avoid any confusion or ambiguity for teachers. That is the main motivation for the MAG's recommendation to amalgamate these documents. However, if this recommendation is not approved, the MAG recommends that the Common Practice Model and teaching sequences be formally issued as part of schools' curriculum regulatory requirements by the Minister of Education, alongside Te Mātaiaho.

At this stage the MAG is not aware of any intention to provide teaching sequences or a Common Practice Model for other curriculum subjects, including subject English. However, given its close association with literacy, the MAG recommends developing a curriculum design for subject English,

and to derive an associated teaching sequence from Year 7, to accompany and complement those being developed for literacy and communication.

2.4 Recommendations

It is recommended that the Minister:

1. Approves the amalgamation of the in-scope areas of Te Mātaiaho, the Common Practice Models and the teaching sequences into a single document, issued as part of schools' curriculum regulatory requirements.
2. That the Common Practice Model and teaching sequences be issued as part of schools' curriculum regulatory requirements if Recommendation 1 is not approved.
3. Approves the removal of progress steps in favour of checkpoints for reading, writing, oral language and mathematics & statistics in the Common Practice Model or amalgamated document, and development of progress checkpoints integrated with the teaching sequences.
4. Approves either (1) the removal of the phase descriptions and outcomes; or (2) the definition of phases as high-level descriptors of UKD, with no explicit expectations for teachers' use of them.
5. Approves the MAG to develop a sequence, checkpoints and teaching methods for subject English from Year 7.

3. Proposed changes to in-scope documents

In addition to the structural recommendations regarding the nature and relationship between the in-scope documents already made in Section 2, the MAG recommends more specific changes to each document. This includes restructuring, condensing, and clarifying the language of each. It also involves aligning the teaching sequences with the teaching advice in the Common Practice Models. Notwithstanding Recommendation 1 to amalgamate the in-scope documents for each learning domain, in this section, the documents are discussed separately.

3.1 Te Mātaiaho - The Refreshed New Zealand Curriculum

The MAG recommends revision of the section in each curriculum document describing the purpose of the domain of learning or subject, definitions of key terms, and phase descriptions to clarify and condense the language, and to reflect other changes recommended by the MAG.

The relationship between English and literacy

Within the English curriculum, there is a complex relationship between literacy and subject English. Furthermore, literacy becomes an increasingly important consideration across the entire curriculum at more senior year levels. In the following section, we discuss the MAG's proposal for expressing the relationship between literacy and subject English.

The MAG recommends organising the English curriculum into five strands: reading, writing, oral language, English language and English literature. The former three belong to literacy, and the latter two, to subject English. English language and literacy are distinct but integrally connected. English language is the content for oracy and literacy (reading, and writing). Oracy comprises the cognitive processes and skills required for oral language competency, while literacy comprises the processes and skills for reading decoding and comprehension, and for language selection and use in writing.

In the early school years, literacy teaching should be primarily, although not exclusively, focussed on foundation skills in reading and writing. From a teaching perspective it is therefore largely distinct from subject English. The successful acquisition of these skills for reading rests primarily on the cognitive automatisation of decoding. Once foundation skills are in place, reading fluency improves with practice, and with engagement with an increasing variety of texts of increasing sophistication.

The development of writing proficiency is less constrained because it is a productive rather than a receptive modality. Nonetheless, the acquisition of more advanced skills in writing, especially the use of writing as a tool to develop thinking, also depends on the acquisition of early and fundamental writing skills such as handwriting, syntax, spelling and punctuation. Beyond these early skills, the

improvement of writing proficiency again depends primarily on practice with the production of texts of increasing sophistication across an increasing range of genres.

At more senior year levels, literacy encompasses generalised knowledge that must be applied to reading and writing across the entire curriculum. Literacy then becomes an important component of every school subject from about Year 7 and must be increasingly integrated with specific subjects thereafter. That is when more specialised aspects of literacy must be addressed (e.g., in science there will be technical vocabulary and structural features such as non-continuous text incorporating diagrams). Furthermore, specifically addressing literacy in all subjects maximises literacy learning time. The relationship is reciprocal; reading and writing skills are further developed by their cross-curricular application. For example, reading for, and writing, scientific reports develops science-specific literacy and also serves the development of literacy skills more generally.

The MAG recommends including English language content *within* the literacy strands of the English curriculum up to Year 6. From Year 7, English language should be taught as a distinct strand that includes its use in reading and writing. That will make the changing relationship between language and literacy across years levels explicit. Up to Year 6, English language content should focus on what is required for students to advance in oracy, reading and writing. From Year 7, it should focus on the use of oracy and literacy abilities and skills in the context of subject English.

3.1.1 Subject English

The purpose of the English curriculum is to support high standards of teaching in language and literature so that students acquire a strong command of the written and spoken word, including in film and dramatic performances, an appreciation of quality literature, and a love of reading for enjoyment. The two recommended strands for subject English are *English language* and *English literature*.

English Language is the coherent and cumulative body of knowledge about what English language *is* and how it *works* – its form and its function. Its content includes grammar, vocabulary, pronunciation, and the language conventions of spelling and punctuation. Together, these strands create students' language and literary repertoires. *English Literature* comprises the study of English-language texts. The MAG believes that a substantial corpus of recommended texts should be made available to schools for use with the English literature strand, from which schools and teachers can select[ii]. This corpus would be referenced in supporting documentation for the curriculum.

[ii] The process for selecting these texts might be overseen by the National Library, with input from literature experts and English teachers. The aim is to ensure that students experience increasingly challenging literature of a high standard.

3.1.2 Mathematics and statistics

The Ministerial Advisory Group: Mathematics and Statistics recommends re-designing the current draft documents for the Mathematics and Statistics learning area (Te Mātaiaho, CPM, year-by-year sequence) to produce a single curriculum document that is internationally comparable in content and pace, and amplifies explicit teaching, intentional practice and formative assessment.

The aims for the revised curriculum document are:

- To provide single point of focus for school leaders, teachers, and whānau.
- To improve clarity for teachers at three levels: Understand-Know-Do, phase by phase, year by year.
- To focus on students developing fluency with foundational knowledge and skills.
- To promote a significant shift towards explicit teaching to support progression.
- The proposed minor and major changes to current documentation are all intended to:
- Increase emphasis on fluency and competence in arithmetic.
- Move to explicit teaching of the whole class as a basis for mathematics and statistics teaching.
- Ensure students practice mathematics and statistics in a purposeful and effective way.
- Make the documents clear and easy to use, with sufficient detail to support teachers' decision making and practice.
- Make sure that students make progress at a pace that enables success.
- Make sure that students have a chance to learn key aspects of the curriculum.

Minor changes:

- The year-by-year sequence and curriculum content (a significant portion of the documents) need minor refinement to address issues with timing and progression. For example, some number skills and some fraction and algebra concepts need to be introduced earlier.
- The 'Space' strand will be relabelled as 'Geometry' for clarity.
- The *Dos* will be reordered to reflect progression through the curriculum.

Titles would include fiction and non-fiction, short stories, poems and plays with a wide coverage of genres, historical periods, and forms, by international and New Zealand authors. Schools would be encouraged to engage students with titles from the corpus. In Years 0-6, many of the titles would be most suitable for teachers to read aloud to students, although some texts, especially those for Phase 2, would be chosen to be accessible to students reading independently. Teachers would select titles to support students' literacy development and to engender a love of books. The corpus for Year 7 on would contain wide-ranging titles of works with specific titles selected by classroom English teachers in order to develop their students' understanding of literature and their reading enjoyment.

Major changes:

- Significant editing of Te Mātaiaho and Common Practice Model content for concision and clarity, and to reflect the shift in emphasis towards fluency and progression will be undertaken.
- The Understands will be rewritten to align with a focus on big ideas in the Mathematics and Statistics learning area: patterns and variation, logic and reasoning, visualisation, language and communication, problem solving as a human endeavour.
- New content will be developed to support and amplify explicit teaching practice.
- New content will be developed to support and amplify intentional student practice.
- New content will be developed to support formative assessment.
- New content will be developed to support planning and organising mathematics and statistics lessons and programmes.

These changes will be evident in:

- Changes to the purpose, aims and big ideas of mathematics and statistics (expressed as Understands) to make them focused on the subject matter.
- A focus on fluency and competence expressed in the phase descriptors, content descriptors and teaching practices.
- A clear articulation of what explicit teaching, intentional practice and formative assessment mean in daily mathematics and statistics teaching.
- Guidance on how to represent and teach particular ideas provided in phase descriptors and in a guidance column in the year-by-year sequence. This will ensure that relevant information about teaching is easily linked to key content where necessary.

3.1.3 Recommendations

It is recommended that the Minster:

6. Approves the MAG to revise the English and Mathematics & Statistics learning areas, to clarify the purposes of each domain of learning and subject, and to clearly define key terms.
7. Approves the MAG to restructure the English and Mathematics & Statistics learning areas, including condensing and clarifying the language of each, and delineating Reading, Writing, Oral language, English language and English literature.
8. Approves the MAG to include English language content within the literacy strands of the English curriculum up to Year 6 and to treat English language as a distinct strand from Year 7 on.

3.2 Teaching sequences

The state of play for the maths teaching sequence is different to that of the literacy and communication sequences. There is already a draft sequence for maths, whereas, as previously noted, the sequence for literacy and communication will be developed through a collaboration between members of the MAG with literacy expertise and the LCG.

The sequences for math are likely to differ somewhat to those for literacy and communication, reflecting their structural differences. In particular, the sequence for maths is likely to be more granular than the ones for literacy and communication. Furthermore, as has been noted in Section 2, the relationship between the teaching methods and the teaching sequences will be different in literacy than in maths, due to differences in the evidence base in the science of learning for each.

The MAG maths subgroup is satisfied that the coverage of the maths sequence already drafted is internationally comparable. However, some elements could be clearer and some adjustments to the pacing of the sequence is required, for example, as noted in Section 3.1.2, some fraction arithmetic and algebra concepts need to be introduced earlier. This will necessarily require a change in focus and intention for teaching, learning and progress in maths, with more structured, procedural learning. Teachers will need support to make this change.

3.2.1 Recommendations

It is recommended that the Minister:

9. Approves the MAG to adjust the teaching sequence for mathematics and statistics to ensure disciplinary integrity and take account of cognitive constraints on learning.

3.3 Common Practice Models

The document should open with sections describing, in accessible and teaching-focussed ways, key concepts from the science of learning. These introductory sections will provide context for specific teaching advice to be given later in the document, with reference back to these key concepts, as needed. If the Recommendation to amalgamate the in-scope documents is approved, these sections would be included there.

For example, the concepts of working memory, cognitive load and schema should all be included. Another introductory section should describe the importance, and effective use, of formative assessment and feedback.

For Literacy and Communication, accounts of key theories of literacy acquisition should be included. For reading, examples include the cognitive foundations of reading[5] and the simple view of reading[6].

For writing, the simple view of writing[7] should be included. There are no analogous generalised theories of learning for maths or subject English.

For maths, effective teaching practices informed by the science of learning, including explicit teaching and supporting students with intentional practice should be included. While the research base for these practices in classrooms is not as clearcut as the research for literacy, applying general principles from cognitive psychology to mathematics suggests that these practices will improve teaching.

If the MAG's earlier recommendation to include checkpoints at important stages of the teaching sequences is approved, it would also be appropriate to include advice to teachers on using the progress checkpoints to monitor students' progress in the documents for all in-scope domains of learning.

Finally, there should also be a section on creating conditions for learning, including the importance of orderly classrooms, and recognising and being responsive to individual students, including their cultures and neurodiversity. Here, the MAG would draw upon elements of the current draft Common Practice Model.

More detailed plans for each recommended amalgamated document are provided in Appendix 3.

3.3.1 Recommendations

It is recommended that the Minister:

10. Approves the MAG to include sections in the Common Practice Model or amalgamated document describing key concepts from the science of learning and the use of formative feedback.
11. Approves the MAG to include in the Common Practice Model or amalgamated document for Literacy and Communication key theories of literacy acquisition.
12. Approve the MAG to include in the Common Practice Model or amalgamated document for Maths effective teaching practices informed by the science of learning.
13. Approves the MAG to include in the Common Practice Model or amalgamated document advice to teachers on using the progress checkpoints to monitor students' progress.
14. Approves the MAG to include in the Common Practice Model or amalgamated document a section on creating conditions for learning.

4. Preparation of documents

The MAG recommends that the Minister authorises the MAG to draft the in-scope documents for testing in schools, with support from suitable experts. The MAG would also like to be involved in the post-testing process (reviewing and responding to feedback). We believe that this approach will yield coherent, clear documents that can readily be understood and used by teachers and ITE providers in as timely a way as possible.

Only one MAG member has specific expertise in oral language teaching. The teaching sequence for oral language is to be prepared by the LCG in collaboration with MAG literacy subgroup. The MAG will require additional oral language experts to assist with the curricula and CPM advice for oral language, and how oral language teaching is informed by the science of learning.

Additional assistance will also be needed for maths; the MAG maths subgroup is smaller than the MAG literacy subgroup. Additional experts should be commissioned to work to the design of each document laid out by the MAG, with the MAG having oversight and editorial discretion over the draft documents to be tested in schools.

4.1 Recommendations

It is recommended that the Minister:

15. Approves the MAG to draft the in-scope documents for testing in schools and to be involved in the post-testing process.
16. Direct the Ministry of Education to work with the MAG to establish groups of additional experts to assist with the work of the MAG, as needed.
17. Direct the Ministry to establish a range of focus groups and contributor groups, including teachers, to provide feedback on draft documents prepared by the MAG, prior to wider consultation.

5. Risks and challenges

5.1 Implementation

A majority of the MAG believes that, if the practices it has recommended for inclusion in the Common Practice Model or amalgamated documents were successfully implemented by the teachers of New Zealand, we would witness a step-change in achievement in all of the domains of learning and subjects in scope. This would have with positive ramifications for educational achievement across the curriculum. Successful implementation, however, faces a number of challenges and risks.

Foremost amongst the challenges is the provision of the type and amount of professional learning and development (PLD) that will be required for teachers to accept and adopt the curriculum and associated practices with fidelity. The current model of PLD provision used by the Ministry of Education is unlikely to deliver what will be required. PLD must be aligned to structured approaches to teaching literacy and maths.

Another risk to successful implementation is the highly decentralised nature of New Zealand's compulsory schooling sector. Every school is an independent Crown agency and there is now a long history of schools developing localised curricula and approaches to teaching. Education agencies have only weak mechanisms to ensure compliance with a compulsory curriculum and mandated teaching methods. The difficulties posed to system coherence by this decentralised structure was canvassed in detail by the Tomorrow's Schools Independent Taskforce during Hon. Chris Hipkins' tenure as Minister of Education[8].

To mitigate the risks to the successful implementation of the proposed curricula and Common Practice Model, it will be important to explain the evidence base for the indicated changes to stakeholders in clear and accessible terms. Such explanations will be included in the introductory sections of the in-scope documents. However, a wider strategy will also be required. This may include, among other approaches, MAG members and others engaging in meetings with schools, teachers' organisations and other stakeholders.

Another mitigation to the risk of low-quality implementation would be to consult with a range of focus groups and contributor groups, including teachers, to provide feedback on draft documents prior to wider consultation. A transparent evaluation strategy would also help to mitigate this risk. Such a strategy would include, but not be limited to, measurement of any change in student achievement in literacy and mathematics. Positive effects on student achievement would improve the willingness of teachers and schools to adopt the new curriculum and teaching methods. Even so,

such positive effects may take some time to unequivocally emerge. Any evaluation should therefore include surveys of schools' implementation fidelity, with data cuts showing changes in achievement schools adopting early, high-fidelity implementation. It is at these schools that improvement can be expected soonest. Optimally, evaluation would commence prior to the implementation of the new curricula and teaching methods, in order to establish baseline data.

To maintain high-quality implementation over time, a clear process to update the curriculum, teaching sequences and common practice models regularly should be designed and implemented, to take account of new research in the science of learning.

5.2 Assessment

Assessment has been discussed in two contexts in this report.

If the MAG's recommendations are approved, formative assessment would feature throughout the specific teaching advice in the recommended Common Practice Models or amalgamated documents. Well-conducted formative assessment, with timely and targeted feedback, is one of the most consistently powerful teaching practices in any teaching situation[9].

The other context of assessment addressed in this report is in relation to the proposed checkpoints. Properly conceptualised, this assessment would also be, in some sense, formative. It would be used to identify students who are falling behind curriculum expectations in order to provide them with additional teaching as early as possible. In accordance with the 'Matthew effect', students who begin to lose pace in their educational achievement tend to do so more and more over time. Early identification of students at risk of Matthew effects would make a strong contribution to the Government's target of 80% of Year 8 students meeting curriculum expectations.

There is a substantial risk, however, of checkpoint assessments being perceived by teachers as summative in nature. If teachers believe that assessment data will be used as measures of the quality of their practice, they will tend to narrow the scope of their teaching to the elements of the curriculum that are directly assessed (i.e., they will 'teach to the test' rather than teaching the full curriculum). That would pose a risk to the improvements to teaching and learning that the recommended changes might otherwise deliver.

The importance of assessment validity for assessing checkpoints cannot be overstated. A valid assessment is one that can be used to support the intended inferences from that assessment. In the case of checkpoint assessments, the intended inferences are of student achievement against the curriculum. To be valid for this purpose, assessments must have sufficient curriculum coverage. They must also be as free as possible from extraneous barriers to students demonstrating their learning

(e.g., reading skill in an assessment that is not intended to measure reading). Students must take the assessments seriously enough to perform as well as they are able.

An invalid assessment is not fit for its intended purpose. Further, it poses threats to teaching and learning of the kind described above. On the other hand, if assessments measure achievement against the curriculum with a high degree of validity, the risk they pose to teaching and learning is substantially reduced. If assessments have enough validity in terms of curriculum coverage, then 'teaching to the test' becomes approximately the same thing as teaching the curriculum.

Successful implementation of the teaching practices described in the Common Practice Models would mitigate the risk of checkpoint assessments driving teaching. Improvement in student achievement resulting from successful implementation would give teachers confidence and build their sense of teaching efficacy. That improved confidence would increase the likelihood of the assessment data being used with educational validity.

5.3 Initial Teacher Education

Currently, Initial Teacher Education programmes in New Zealand do not typically have a strong focus on the implications of the science of learning for teaching practice.[35] The prospects for successful implementation would be improved if teaching based on the science of learning was to feature more strongly in these programmes.

Appendix 1: The case for change

Reading, writing and maths have a number of commonalities. As noted in the Introduction, all are foundational for students' access to the wider curriculum. Furthermore, success in literacy and maths is reciprocal – maths learning benefits from the development of literacy knowledge and skills, and vice-versa.

Another similarity of early learning in literacy, and learning in maths throughout the curriculum, is that this learning places particularly high demands on the limited resources of working memory. Another way of saying this, is that it is particularly demanding in terms of cognitive load. That makes it especially important to ensure that knowledge and skills upon which later learning depends are well established in long-term memory. If they are not, then when students undertake later learning, they are likely to experience overload – that is, the limited capacity of working memory, essential for learning novel content, becomes overwhelmed.

Cognitive overload has a detrimental effect on learning in more ways than one. When students experience cognitive overload, not only do they struggle to learn – they often also experience anxiety and loss of confidence. That often flows on to demotivation and disengagement, and potentially, to disruptive behaviour and truancy.

The avoidance of students experiencing undue cognitive load is therefore a key reason to adopt explicit teaching practices that are aligned with evidence from the science of learning. In the current draft of the Common Practice Model, Explicit and intentional teaching has been identified as a key approach, although it sits alongside, and is arguably obscured by, several other approaches. Instead, Explicit and intentional teaching needs to be understood as the key approach for both reading and writing instruction, especially in the early years, and maths instruction.

The proposed Common Practice Model would bring together curriculum knowledge (the teaching sequence), teaching practice (the teaching practices and teaching methods) and assessment (the checkpoints). In addition to introducing a well-structured sequence of teaching linked to effective teaching methods, the proposed Common Practice Model would ensure consistency in content and teaching practice across schools. This is especially important for transient students, many of whom attend two or more schools during a single year.

In the following sections, a historical background and justification for the changes to the in-scope documents recommended by the MAG is provided, for each of reading, writing and maths.

Reading

The 1991 international study of literacy achievement carried out by the International Association for the Evaluation of Educational Achievement showed that New Zealand had the largest spread of scores among the participating countries[10], and that low-performing readers were likely to be children from low-income backgrounds[11]. Other studies such as PIRLS[3] and PISA[1] show similar declines and high variability compared with other participating countries.

Efforts to improve the reading achievement of New Zealand children and to reduce the large inequities have failed[12]. This is despite significant resources being invested by successive governments since 1991. Many of these resources have focused on the context and conditions of learning (socio-cultural factors along with school environment and resources). Little attention has been paid to the processes of teaching and learning, or to developments in the science of learning. This oversight has had profound effects on the lives of many New Zealand children as they become adults, because of the social and economic consequences of poor literacy achievement in school.

The decline in reading performance and failure to reduce inequities in literacy learning coincides with the adoption of the whole language approach to literacy teaching during the 1980s. This approach is based on the false belief that learning to read is like learning to understand oral language; both abilities are thought to occur naturally. This approach is promoted in handbooks supplied to teachers by the Department/Ministry of Education (e.g., *Reading in Junior Classes*[13]; *Effective Literacy Practice in Years 1 to 4*[14]). Under this view, direct instruction in specific word knowledge or alphabetic skills is held to be of little value. As two influential whole language advocates wrote, “children learn to read themselves; direct teaching plays only a minor role”.[15]

New Zealand teachers have been trained to encourage beginning readers to use a range of cues for identifying unknown words in text. These cues include pictures, sentence context, the developing meaning of a passage, along with semantic and syntactic cues. This amounts to teaching children to *guess* unknown words. The use of such cues reinforces the use of strategies that weak readers use.

Four decades of scientific evidence has provided no support for the whole language, multiple cues approach to reading instruction. Furthermore, recent advocacy of so-called ‘balanced’ literacy instruction has done nothing to move the emphasis away from the use of multiple cues. Adding some phonics instruction and claiming this represents a “balanced” approach does not alter the overwhelming disadvantage of the multiple cues approach embedded in whole language literacy instruction.

Research on how children learn to read (embodied in the science of reading) shows that growth in the ability to get meaning from text depends on the ability to recognise words accurately and quickly.

Children need direct, explicit instruction in using letter-sound information to figure out unknown words. Making use of letter-sound relationships is the basic mechanism for building a word vocabulary. Teaching for phonemic awareness, together with letter-sound instruction, facilitates successful reading achievement. In addition, explicit, systematic teaching of alphabetic coding skills involving phonics instruction is beneficial for most children, and crucial for some.

For many decades, New Zealand's approach to accelerating children who show early signs of reading failure has been the Reading Recovery (RR) programme, recently changed to 'Reading Recovery & Early Literacy'. The instructional model of RR is based on whole language principles and beliefs. RR was developed during the 1970s by Marie Clay at the University of Auckland and introduced throughout the country in the 1980s. Its goal is to reduce substantially the incidence of reading failure by accelerating the reading progress of six-year-old children who show early signs of reading difficulty. Clay claimed that RR "should clear out of the remedial education system all the children who do not learn to read". [16]

Even though RR has been one of the most researched intervention programmes in the world, there are few properly conducted studies suggesting that it works. While children who successfully complete RR typically show improvements in word recognition skills, nearly 50% lose those gains within 2 to 4 years[17]. The long-term benefits of RR for many children are weak at best[18].

The number of schools offering RR has dropped from around 85% in the 1990s to 37% in 2022[19]. The drop is likely due to improvements in Year 1 reading instruction (e.g., Better Start Literacy Approach) as well as better remedial programmes already in use that provide various structured literacy teaching approaches. Discontinuing RR and diverting funding (around $25 million per year) to increase access to quality, scientifically based programmes would benefit far more children.

Writing

Rates of achievement in writing are currently poor, particularly so for students from low-income backgrounds. For example, in a Ministry pilot of new NCEA literacy standards in 2022, just 34.5% of students attempting the standards, mostly in Year 10, passed writing[20]. This was poorer than performance in the other two co-requisite assessments for reading and numeracy. The standards were intended to reflect only basic adult levels of skill in these three domains. Most concerningly, just 2% of Decile 1 students passed the writing standard.

The reasons for the currently poor achievement of New Zealand students in writing are similar to the reasons for those the decline in reading achievement. Like the teaching of reading, the teaching of writing has, since the early 2000s, been influenced by the whole-language philosophy. Teaching handbooks (for example, Graves' *Writing*[21]) de-emphasise the importance of explicit teaching and

the teaching of technical skills such as handwriting and spelling. Instead, teachers are advised to consider conventions of correctness only in the final stages of drafting. Teachers are advised to ignore poor handwriting or a messy page[20]. Such advice is not supported by empirical studies.

Recent New Zealand research provides some insight into the impact of the Ministry's advice, on New Zealand teachers' beliefs and practices. A 2015 survey of 118 teachers[22] indicates that New Zealand teachers placed a "relatively minor emphasis on teaching basic skills". A 2018 survey of 626 New Zealand teachers suggests that many underestimate the importance of explicit teaching and the teaching of technical skills[23]. The latter study also showed that explicit teaching, of technical skills in particular, is associated with greater progress in writing than practices associated with the whole language approach. The findings of these New Zealand-based studies align with those of many empirical studies internationally. This body of research is concordant with the seminal, empirical model of writing development: The *Simple View of Writing*[6].

The Simple View model identifies three sets of sub skills necessary for successful writing:

1. Translation – turning one's thoughts into words and sentences, which requires knowledge of vocabulary and sentence structure.
2. Transcription – physically getting one's thoughts onto the page, using handwriting or typing.
3. Executive function – being an intentional and self-aware writer, able to manage all of the demands of a writing task, including content knowledge, knowledge of conventions, and the processes of planning, re-reading, evaluating, editing, and revising.

These writing processes do not follow one another but interact throughout composition. A good writer reads, checks, evaluates and revises constantly. Because these processes must be used interactively and recursively, writing has been described as 'a juggling act'[24]. If the technical basics of writing, such as letter formation, have not been practised to the point of cognitive automaticity, they are likely to occupy the entire capacity of working memory and prevent a student from attending to the ideas they wish to express[25].

The main emphasis in the teaching of writing in the early school years must be on the explicit teaching of translation and transcription, to ensure that these skills are automatised. This frees working memory to manage the executive processes, which cannot, by-and-large, be automatised. Clear and focused learning objectives are one way to support the automatisation of the technical skills of writing. Timetabling is also key. New skills and knowledge must be revisited on a daily basis until students demonstrate fluency. Then, teachers can trust that a new skill has been integrated into long term memory (i.e., automatised) and no longer requires working memory resources. At this point, new skills and knowledge can be introduced.

Teachers must be given a clear signal that students should be writing by hand as much as possible during their primary school years. Some students will require assistive technology to access the curriculum and communicate, and schools do also need to develop digital fluency, but technology not be used to avoid or justify not teaching handwriting to students who can develop competence with explicit instruction. Handwriting better supports the learning of spelling and decoding than typing or working with letter tiles[26]. Writing by hand also helps to secure new conceptual and vocabulary knowledge[27].

Common issues for reading and writing

While there are many similarities in the processes of learning to read and write, there are also differences. Therefore, the fundamental subskills of reading and writing should be presented separately, and reading and writing should be taught as distinct sets of skills. While the progress steps for Literacy in Years 0-3 include explicit objectives for technical skills, their grouping under the heading of 'literacy' in the current documents means that their different significance for learning to read and learning to write is unclear.

In the refreshed English curriculum, texts are defined as written, oral or visual. However, to ensure that teachers and students spend adequate time learning to read and write, texts should be defined exclusively as written material. A related problem is the emphasis on 'multimodal texts' (film and digital media), and 'augmentative communication' (gestures and picture symbols). Again, these emphases could result in insufficient time teaching students to read and write written material.

New Zealand urgently needs a different approach to the teaching of reading and writing. The Ministry of Education has introduced some new programmes that are promising in this regard. It has foreshadowed a different approach in their 2022 *Literacy & Communication and Mathematics and Statistics Strategy*: "In the first phase of learning in primary school, explicit teaching should focus on learning the alphabetic code, phonological and phonemic awareness, handwriting, vocabulary development, oral language skills, and sentence construction"[28] (p. 23). This view is consistent with findings from the science of learning and marks a significant departure from four decades of whole language instruction. The next step is to embed this approach in curriculum and teaching practice.

Mathematics and Statistics

Since the last significant reform of the teaching of maths in New Zealand, there has been a shift in perspective on the application of cognitive science principles to teaching. This has arisen from the need to understand and address the concerning decline in student achievement in many countries, including New Zealand.

In the early 2000s, there was a prevailing belief that, by examining how experts think and operate, we could distil their strategies into teachable modules for novices, thereby fast-tracking their journey towards expertise. This assumption rests on the notion that expertise is simply a matter of adopting expert-like thinking patterns.

We now understand that expertise is not merely a collection of strategies, but rather, a result of a prolonged and deliberate process of knowledge accumulation and cognitive schema formation. Experts do not simply possess superior techniques. They have developed a vast network of interconnected schemas built upon years of experience and practice. These schemas enable experts to navigate complex scenarios, drawing upon a wealth of accumulated knowledge to inform their decisions and actions.

In simpler terms, the belief that we can directly teach students (novice learners) to solve problems with the same flexibility and creativity as experts is misguided. That approach fails to recognise that flexibility and creativity is founded upon structured knowledge stored in long-term memory as well-organised schemas. When experts encounter new problems, they can draw on these schemas to recognise patterns and select relevant knowledge to implement effective solutions.

The limitations of working memory have been largely overlooked in the teaching of mathematics in the past 20 years, just as they have been in the teaching of reading and writing. This is particularly so in New Zealand primary schools, where teaching flexible number strategies has been favoured over teaching structured, procedural methods designed to be efficient, both in execution and cognition. A number strategy often requires multiple items of information to be held in mind simultaneously. This can quickly overload the limited capacity of working memory, especially in younger learners. Over time, experiencing cognitive overload can result in students developing negative perceptions, both of maths itself, and of their ability to do maths.

Children are novice learners. Cognitively, they are neither experts nor adults. Rather than attempting to shortcut the pathway to expertise, we need to foster an environment that nurtures long-term retention of knowledge and skills. We need to do this in a structured manner, sensitive to the cognitive load on learners, so that their confidence is maintained.

The MAG recommends a structured approach to teaching maths, starting with foundational knowledge and skills and building upon them gradually. Establishing a solid foundation of interconnected knowledge and mastering skills are essential stepping stones towards more advanced problem solving. Problem solving should not be viewed as a free-form activity of creative expression, but rather a purposeful opportunity to apply knowledge and skills already learned.

Procedures provide learners with structured steps to follow when solving problems. For novice learners, an incremental approach that builds on their existing knowledge and skills is fundamental to managing cognitive load and maintaining confidence.

As students gain fluency with a procedure, they have more working memory resources available to devote to higher-order cognitive processes, such as understanding the underlying principles of the procedure, applying their knowledge to word problems, and making connections with prior knowledge. All of these things strengthen their conceptual understanding.

There has been a tendency to downplay the importance of repeated practice, often associated with negative connotations of rote learning without understanding. However, this overlooks an important part of the learning process: the retrieval of knowledge and skills stored in long-term memory. Repeated engagement with skills builds fluency. With increased fluency, learners may allocate cognitive resources towards higher-order comprehension and problem solving rather than basic skill execution. Meanwhile, repeated retrieval of knowledge creates opportunities to make connections and improve understanding.

By reframing repeated practice as a strategic and integral component of the learning process, teachers can harness its potential to develop fluent proficiency, thereby increasing capacity to tackle more complex tasks and improve understanding. Effective practice techniques include spacing out practice sessions over time for more robust long-term retention and interleaving a variety of skills to be practised within a single session to engage students with the practice in more meaningful ways.

Appendix 2: Standards of evidence

A theoretical claim rests on the quality of the studies used to test it. The theories that comprise the science of learning have, by definition, been tested using experimental methods. Experimental studies involve the manipulation of one or more (independent) variables, to estimate the effects of those manipulations, including their interactions, on one or more measured (dependent) variables across experimental conditions. A control (non-treatment) condition is an essential component of an experiment. The size and representativeness of participants samples, the validity of dependent measures and the appropriateness of statistical analyses all influence the weight that a study should be afforded. Replication is also highly desirable – it contributes to the explanatory validity of a theoretical claim.

Theories in the science of learning, like all scientific theories, are provisional. They will be refined and, in some cases overturned, by future research. Teaching advice should be updated as its theoretical background develops.

Intervention studies

The science of learning provides an empirically tested theoretical background for effective teaching. That background is not however, on its own, enough to provide confidence that specific teaching methods will be effective. A key consideration here is *ecological validity*. The ecological validity of a study is the extent to which its results are applicable in the intended setting. For present purposes, that setting is the classroom. A teaching approach may be well founded in rigorously tested cognitive theory but, nonetheless, be of limited use in the classroom. Classrooms place many constraints on what is possible in teaching. One such constraint is class size. Some teaching approaches might be highly effective with a single student or small group, but unfeasible to implement effectively at the level of a whole class. Other constraints include school timetables, curriculum requirements, availability of material resources and teacher expertise in a subject.

To establish that a teaching approach has ecological validity, intervention studies are required. Intervention studies involve the testing of a target teaching approach in classrooms and measuring the effect of that intervention on students' learning.

Intervention studies vary in quality. Some lack control groups, making it difficult to tell whether any apparent improvement in learning is attributable to the intervention itself or to extraneous factors. These include the maturation of students, other educational changes during the period of the intervention and additional effort made by teachers when they know their students' learning will be measured by researchers. Some studies use measurement instruments and procedures of

questionable validity. Some use inadequate sample sizes or biased samples (e.g., participants mostly from affluent socioeconomic strata).

The MAG will consider only studies that use quantitative measures of learning, preferring those with psychometric properties that have been shown to be valid. Experimental or quasi-experimental studies (those using control or quasi-control groups) are given more weight than those that lack control groups. True experiments will be preferred to quasi-experiments; the latter tend to over-estimate effect sizes relative to the former[29]. Replication is, again, a criterion. Claims about teaching methods that rest on very few intervention studies, are suspect.

In intervention studies, the representativeness of participant samples is particularly important. Sample bias – the skewing of samples towards certain student demographics and away from others (e.g., more females than males or vice-versa; disproportionately more students from affluent communities) can result in mis-estimation of effect sizes. Ideally, a teaching intervention must be shown to be effective for both male and female students, students from different socio-economic strata and students with different cultural affiliations.

The best way to achieve a representative sample is through random selection. However, because schools can decide whether or not to participate in research studies, random selection is not usually possible. Participating in research studies places an imposition on a school's operation. Schools that are struggling to find staff or manage students' socioeconomic situations may often lack the operational flexibility to participate. This might be expected to result in a bias of educational research samples towards schools and students serving more affluent communities.

Sample stratification is one way to address the problem of establishing representative samples when random allocation is not possible. This involves selecting samples in a way that distributes characteristics known to be correlated with educational achievement – e.g., students' sex, ethnicity, age range and socioeconomic stratum – proportionate to the distribution of those characteristics in the population. Stratification is less rigorous than random allocation because it does not account for the non-random effects of *all* sample characteristics, only those that have been used to stratify the sample.

Intervention studies are of limited applicability if they are not conducted using samples of students in the target age range – for example, if a teaching approach is being evaluated for its efficacy with primary-aged students, intervention studies testing that approach with secondary-aged students is of limited utility.

Finally, if a study is to contribute to the evidence base for teaching advice, it must be conducted in context; that is, in classrooms, with teachers delivering the intervention. Some interventions involve

removing children from normal classroom activities, with interventions delivered one-on-one or in small groups, often by researchers rather than teachers. Others use researcher-designed measures rather than standardised tests. Studies of that nature lack ecological validity and often overestimate the sizes of intervention effects[30].

A perfectly conducted intervention study is rare. For that reason, the evidence from studies with any flaws in design, sampling, measurement or analysis should not be ruled out. Interpretation of evidence does need to be tempered, however, based on the degree of rigor with which studies have been conducted. To the greatest extent possible, the advice on teaching approaches should be supported by multiple studies that corroborate one another and are consonant with the scientific literature on human cognition, motivation, affect, neurodiversity and development.

Meta-analyses

Meta-analyses are syntheses of research evidence drawn from multiple studies. They estimate average effect sizes attributable to each factor of interest. For present purposes, these factors are teaching practices. Meta-analyses are, in some ways, a useful source of evidence. They provide a statistical 'summary' of the evidence on the effectiveness of specific teaching practices. They have limitations, however. The studies used in a meta-analysis are often conducted across a range of contexts, including student age groups, countries, socioeconomic strata, and more. A practice that is effective in one context might be ineffective or counterproductive in another.

In a meta-analysis, studies showing positive and negative effects tend to cancel one another in the estimated nett effect size. The contexts and nuances of individual studies are often lost. An apposite example is meta-analysis of streaming – separating students into classes based on prior attainment. Typically, aggregate effect sizes associated with streaming are close to zero. However, while streaming sometimes improves the achievement of students in higher streams, it often disadvantages students in low streams. The effects in those different contexts often cancel in the overall effect size[31].

Meta-analyses can be a useful starting point for investigating the effect of a target teaching practice. They should note, however, be relied upon as a sufficient source of evidence on their own. Well-designed individual studies with sufficiently large and representative samples provide a much more nuanced source of evidence.

Available evidence for in-scope subjects and learning domains

The science of learning includes both general theories of cognition applicable to teaching across both literacy and mathematics, as well as research specific to each. General theories include, for example,

the theory of working memory, cognitive load theory and schema theory. Research on formative feedback also has general relevance across all subjects and domains of learning. Beyond these general theories, the strength of the research evidence relevant to teaching and learning varies across the domains of learning and subjects within scope: maths, literacy and communication, and subject English.

Literacy

Of the domains of learning and subjects within scope, the specific evidence that can be directly applied to teaching practice is strongest in the literacy domain, especially early-years literacy. For reading, foundational research in psycholinguistics has established well-tested theories of visual word recognition and sentence parsing, including the roles of orthography, phonology, morphology and semantics. The teaching of writing is somewhat less well served in its research base, although a substantial body of evidence is nonetheless available.

On this theoretical foundation, theories of literacy acquisition, also supported by empirical data, have been developed. Perhaps the most well-researched example is the 'simple view of reading'[5], which posits reading to involve a combination of oral language and the ability to decode text, with the weaker of the two limiting a student's reading skill.

For early writing, the simple view of writing[6] is central. This theory focusses on the necessity to automatise basic skills such as letter formation, spelling and syntax in order to free limited working memory resources for aspect of writing that cannot be automatised, such as goal setting, planning and revision.

Beyond the basic research, there is a body of research literature reporting intervention studies testing the effectiveness of specific methods and content of teaching. This research is essential to determine that teaching approaches based on the background theories work in practice.

The science of learning, as it relates to literacy, is principally concerned with the processes by which decoding, visual sentence parsing, and the mechanical aspects of writing (letter formation, punctuation, syntax, spelling, etc.) become cognitively automatised. As such, they are much more applicable in early literacy than they are at later year levels.

Once students have acquired the ability to decode fluently, and automatised the fundamental skills of writing, cognitive load, for example, is not as great a concern as it is in early reading and writing, and in mathematics at all stages of learning. There is, however, a considerable empirical literature on the effective teaching of reading comprehension from about Year 4. This is clearly relevant to the further development of literacy (and to subject English).

When the fundamentals of reading and writing have been established, literacy begins to merge with subject English (and with other school subjects, albeit to a lesser extent). For example, creative writing arguably belongs both to literacy and English, as does fostering students' reading for pleasure. Other skills, such as the ability to analyse and critically read texts belong more specifically to subject English. It should be noted though, that the boundary between literacy and subject English is contested.

Oral language

Several documents for the early childhood sector are focused on growing oral language skills and may have relevance to early primary education. These include *Kōwhiti Whakapae*, *Talking Together*, and the *School Entry Kete*. The teaching sequence and strategies in these documents may overlap with those included in Te Mātaiaho for oral language development in Years 0-3. However, while there is an opportunity for oral language skills to be developed in the preschool years, there is great variability across early childhood centres in the way these documents are used. Oral language skills begin to develop, and ideally are encouraged to develop, prior to school entry, and provide a key foundation for the development of reading and writing skills during the primary school years. Therefore, consideration of ways to increase the national consistency of early childhood centres in fostering these skills would be useful.

Subject English

Knowledge and understanding in subject English are established cumulatively throughout the school years, with later concepts building on earlier ones[32]. This cumulative nature can be seen in both the language and literature aspects of the subject – for example, grammar, punctuation, orthography, literary stylistic features, and figurative language. While the MAG is not aware of any subject-specific research from the science of learning that applies to subject English, general cognitive theories have implication for both its curriculum design and teaching practice.

Following cognitive architecture principles from the science of learning, curricula for subject English should be designed with attention to its cumulative nature[33]. For example, "Linguistic knowledge stored in long-term memory can include phonology, orthography, morphology, vocabulary, syntax, and genre. Topic-specific knowledge can also be developed and committed to long-term memory. It can also include established beliefs, values, and interests about writing, how one identifies as a writer, and knowledge of writing strategies that can be used".[34] Similarly, in accordance with cognitive load theory, subject English should be taught in a designed sequence to avoid overloading working memory.

Other general cognitive theories are also relevant in subject English, as they are in any school subject. For example, establishing sophisticated cognitive schemas that organise relevant knowledge enables students to engage in high-level cognitive activities. In English, activities such as literary criticism, for example, rely on cognitive schema – in this case, knowledge of unifying concepts across a range of texts. Schema theory makes clear the importance of background knowledge to any situation requiring critical or creative thinking. Formative assessment and feedback are also important in subject English, as they do in any teaching.

Mathematics and statistics

The research base supporting science-of-learning-based teaching of maths is weaker than that supporting early literacy. That is because, from a learning perspective, maths is a much less constrained domain than early literacy. Even more than subject English, maths learning is layered – it involves building on existing knowledge and skills to establish more advanced knowledge and skills. That remains true throughout schooling and beyond. Like subject English, the open-ended nature of maths learning makes it difficult to establish general theories of teaching and learning like those that exist for early literacy. There is a body of evidence from intervention studies, but these necessarily focus on quite specific aspects of maths learning. Furthermore, they tend to suffer from flaws such as small and unrepresentative samples. A lack of longitudinal studies is also a weakness in this evidence base. Longitudinal studies track learning progress over time. They therefore enable researchers to determine whether a given intervention results in students make more progress than those not exposed to that intervention.

The implications of the science of learning for maths, and subject English are, therefore, more general than specific. The theories of cognitive load, working memory and schema, and the importance of frequent corrective feedback are nonetheless applicable across the span of the mathematics curriculum. It is primarily these theories, therefore, that can inform the teaching of mathematics and subject English, from a science of learning perspective.

Appendix 3: Proposed contents of in-scope documents

All documents will open with sections, contextualised to the learning domain or subject and including relevant examples, as follows:

- The concepts of working memory, cognitive load and schema formation and their applications in teaching
- The importance and effective use of formative assessment and feedback as a key teaching practice
- Advice on using checkpoints to identify students not meeting curriculum expectations
- Creating classroom conditions conducive to learning

English, Literacy and Communication

Literacy

Introduction to the Literacy progress steps and methods:

- An explanation of the empirical research that underpins the progress steps
- An explanation of the organisation of the literacy area into its two strands of Reading and Writing
- An explanation of the Simple View of Reading and Simple View of Writing models and their implications for teaching
- Connections between oral language, reading, and writing
- The relationship of literacy to Subject English

Teaching sequence and summary of teaching methods in Years 1-3:

- Teaching sequences with progress steps and a brief description of teaching methods displayed alongside one another. This will ensure that teachers easily see the links between teaching objectives and teaching practices.
- The reading and writing teaching sequences have been organised into sub-strands taken from the sub-skills identified in the SVR and SVW. For reading, these include Word Recognition and Language Comprehension. For Writing, they include Handwriting, Spelling, Sentence Structures and Punctuation Use, Vocabulary Knowledge and Composition (content, form, and processes).

Teaching methods that require further explanation will be accompanied by a page number indicating where in the Practice Guides (see below) teachers can turn to for more detailed advice.

Practice Guides for Literacy in Years 1-3:

- Using a scope and sequence in Years 1-3
- Teaching phonemic awareness, alphabet, and phoneme/grapheme correspondences
- Teaching decoding in Years 1-3
- Building reading fluency in Years 1-3
- Teaching high frequency words for reading and spelling in Years 1-3
- Using decodable books in Years 1-3
- Using levelled texts in Years 1-3
- Small group reading lessons in Years 1-3
- Whole class shared reading in Years 1-3
- Reading picture books in Years 1-3
- Building vocabulary knowledge in Years 1-3
- Teaching handwriting in Years 1-3
- Teaching spelling in Years 1-3 – key principles
- A recommended routine for teaching spelling in Years 1-3
- Key elements of a Writing lesson in Years 1-3
- Supporting spelling during Writing lessons in Years 1-3
- Feedback during the Writing lesson in Years 1-3

The guides will cover teaching methods for all the key sub-skills necessary for literacy success. Advice will be as succinct as possible and will be accompanied with a reference list to make explicit the evidence, and serve as a recommended list for further reading.

Three Teaching Progressions for progress steps and a summary of methods for Years 4-6:

- One for each Reading and Writing
- Organisation will follow the format of the Year 1-3 Teaching progressions.

Note that, from Year 7, Literacy will be replaced with Subject English.

Practice Guides for Literacy in Years 4-6:

- Using a scope and sequence in Years 4-6
- Extending decoding skills in Years 4-6
- Extending comprehension in years 4-6: summarising, analysing, and making connections
- Teaching high frequency words for reading and spelling in Years 4-6
- Small group reading lessons in Years 4-6
- Reading sophisticated picture books in Years 4-6

- Reading a class novel in Years 4-6
- Building vocabulary knowledge in Years 4-6
- Teaching handwriting (including cursive) in Years 4-6
- Teaching spelling in Years 4-6, key principles
- A recommended routine for teaching spelling in Years 4-6
- Teaching conventions of text structure and style
- Key elements of a Writing lesson in Years 4-6
- Supporting spelling during Writing lessons in Years 4-6
- Feedback during Writing lessons in Years 4-6

Organisation of these will follow the format of the Year 1-3 Practice Guides.

Teacher Knowledge Guides:

- Teacher knowledge for teaching spelling: speech sounds, vowels and consonants, spelling patterns and spelling rules
- Teacher Knowledge for Teaching Sentence Structure
- Punctuation Guide
- Paragraphing Guide
- Teacher Knowledge for Teaching Text Structures

The guides will support teachers with their content knowledge for teaching literacy

Other Resources

This section will include word lists, and lists of high-quality children's books:

- High frequency word lists for the different year levels
- Recommended picture books for Years 1-3
- Recommended picture books for Years 4-6
- Recommended class novels for Years 4-6

Oral language

Introduction to Oral Language

Oral language as the foundation for reading and writing

Oral (spoken) language Years 1-6:

- List of skills children will be taught from Years 1-6:
    1. Speak audibly and fluently with an increasing command of New Zealand English. Refer to 'word lists' under Reading and Writing Vocabulary Knowledge strand.
    2. Listen and respond appropriately to others.

3. Maintain attention of others and participate actively in collaborative conversations.
4. Give well-structured descriptions, explanations and narratives for different purposes, including for expressing feelings.
5. Ask relevant questions to extend their understanding and knowledge.
6. Articulate and justify answers, arguments and opinions.
7. Participate in discussions, presentations, performances, role plays, improvisations and debates.
8. Gain, maintain and monitor the interest of the listener(s).

These sample skills will apply to all year levels, with the content taught at a level appropriate to the age of the students. Oral language skills taught in preceding years will be built on in subsequent years. Examples will be provided of what each skill should look like at each year level.

Environmental factors that foster oral language:

- Students will have opportunities to engage in dialogic conversations.
- Teachers will use increasingly sophisticated spoken language and model correct use of spoken language, such as sentence structure vocabulary.
- Examples will be provided of teacher activities to foster an environment that strengthens oral language.

Oral language screening tools for new entrant students to determine pathway on school entry

Teachers will be provided with a selection of oral language screening tools to determine a student's oral language skills on school entry:

- Junior Oral Language Screening Tool (JOST)
- Kindergarten Language Screening Test (KLST)
- Record of Oral Language

Pathway 1: Intervention for students with inadequate oral language skills on school entry

Rubric for specific oral language skills (e.g. initial phoneme identification), teaching methods, and progressions for each skill

Pathway 2: For students who have adequate oral language skills on school entry Teachers will use the reading and writing rubrics.

Subject English (from Year 7)

Note that the sequencing for subject English is yet to be developed. The following specifies the content to be included, organised into programmes. Each programme will include Teaching Methods, Teaching Resources, Student Activities, and the types of competency students will develop.

Grammar programme:

- Syntax – sentences, clauses (main, subordinate, relative), phrases
- Sentences – simple, compound, complex
- Singular and plural
- Subject and predication
- Tenses
- Parts of Speech – nouns, verbs, adjectives, adverbs (of time, manner, place), fronted adverbials, prepositions
- Pronouns, relative pronouns
- Voice – active and passive
- Sentence effects
- Paragraphs

Vocabulary programme:

- Vocabulary Acquisition
- Morphology – prefixes, roots, suffixs
- Pronunciation – monosyllabic, polysllyabic, familiar, unfamilar, non-English
- Homonyms, synonyms
- Etymology
- Dictionary use
- Latinate terms
- Speech – monologue, dialogue, formal, informal, recitation
- New Zealand English Development

Punctuation programme:

- Capitalisation, full-stop, comma, exclamation mark, question mark, colon, semi-colon
- Apostrophe (Topic Exemplar in separate file)
- Speech marks
- Conventions – italics, bolding, dash, hyphen, parenthesis
- Abbreviations

- Use of punctuation for writing effect

Spelling programme:

- Rules and exceptions
- Meaning and spelling
- Pronunciation and spelling
- Standardisation
- Historical variation
- National variation
- Text-type variation

Types of writing programme:

- Expository Writing – description, argument, explanation, justified opinion
- Personal Writing – diaries, letters, reflections
- Narrative Writing – story-telling, characters, plot, setting

Visual programme:

- Film and video making and analysis
- Internet posts

Performance programme:

- Role-playing
- Drama
- Debating
- Speech types – greeting, summation, eulogy, family occasion
- Speech-making features – formal, audience, language type, physical presence
- Speech language techniques – structure, repetition, humour, irony, paradox, pun

Poetry programme:

- Significant poems
- Popular poems
- Poetry types – lyric, ballad, epic, doggerel, limerick, sonnet, haiku, cinquain, elegy, acrostic, free verse, epigram, ode, narrative, epitaph
- Poetry sound devices – onomatopoeia, rhythm, rhyme, repetition, alliteration, assonance
- Poetry imagery devices – metaphor, simile, allusion, litotes, hyperbole, personification, oxymoron, euphemism

Stories programme:

- Short stories
- Novels
- Non-fiction
- Traditional tales

Plays programme:

Topics for each year level to be written.

Shakespeare programme:

Topics for each year level to be written. .

Libraries and literacy Programme:

- Origins of human writing
- Origins of the English alphabet
- History and spread of literacy (reading and writing)
- History of libraries
- Libraries in New Zealand
- Library systems
- Literacy technology – from the printing press to the word processor

Mathematics and Statistics

Purpose and aims

This section will emphasise the need for confidence and competence with mathematics and statistics knowledge and skills, built through developing fluency with mathematics and statistics.

Document structure and guide

A diagram will show the information in the document and explain the purpose of each item. It will include an explanation of where schools and teachers have choices to make.

Conceptualisation of UKD

- *Understand* statements: revised to cover patterns and variation, logic and reasoning, visualisation, language and communication, and problem solving as a human endeavour.
- Definition of the six *Know* categories: Number, Algebra, Geometry (changed from Space), Measurement, Statistics, Probability
- Definitions of the *Do* practices: these will remain similar to the current draft but re-ordered.

Teaching practices:

This section will comprise an overview of teaching practices that support progress in mathematics and statistics. The chart below summarises current thinking about what these practices might be.

Teach explicitly	**Design intentional student practice**	**Provide opportunities to apply knowledge in context**	**Lead exploration and investigation**	**Continuously gather and use information about students' learning**
Structure teaching to be clear and logical. Use correct mathematical language. Support learning with visual representations. Connect learning across strands.	Design practice purposefully, both content and the way it is presented and organised. Use variation to improve understanding. Use retrieval practice to improve automaticity.	Support students to comprehend word problems. Design tasks to encourage transfer of learning.	Provide opportunities to explore mathematical and statistical patterns and relationships. Support students to use mathematical and statistical approaches to investigate situations or things.	Support students to learn from their errors. Monitor students' skills and knowledge as you work with them. Give learning-focused feedback.

This would be followed by brief, high-level notes about how to apply these practices across the areas of the curriculum.

Statement of the overall intent at Years 0-3 (draft)

An emphasis on practice in these early years will aid later fluency and progression. Students will:

- Develop confidence and fluency with numbers, counting and place value through the use of concrete materials and pictorial representations.
- Be able to work with whole numbers with conceptual understanding of the four basic operations.
- Develop an understanding of fractions as numbers and as operators
- have meaningful experiences of number concepts through connected learning across strands.
- Read and write numbers and simple mathematical statements, and use oral communication to express their ideas using mathematical and statistical vocabulary.

This section will also include:

- A statement about what the *Do* practices at Years 0-3 comprise (not yet drafted).
- Specific recommendations about teaching practices (not yet drafted).
- The *Knows*, presented year-by-year, tabulated so the sequence is clear, and with a guidance column that notes any particular content aspects that need highlighting. More in-depth information could be included in an appendix. Layout below:

	Six months	**Year One**	**Year Two**	**Year Three**	**Guidance**
Number					
Algebra					
Geometry					
Measurement					
Statistics					
Probability					

This material draws from the current year by year sequence and phase end statements, with some changes to reflect the new emphasis on fluency and arithmetic competence.

Statement of the overall intent at Years 4-6 (draft)

An emphasis on practice during these years will aid later fluency and progression. Students will:

- Extend their understanding of the place value number system to include negative integers, decimal numbers, and decimal place value.
- Practise efficient written methods to perform calculations with whole numbers, decimals and fractions.
- Have meaningful experiences measuring angles, perimeter and area.

- Continue to increase their mathematical (particularly geometric) and statistical vocabulary and use written and oral communication to express their ideas, including correct mathematical statements.
- By end of the end of Year 6, have fluent recall of multiplication and division facts up to 10×10 and be able to identify square numbers up to at least 100.

This section will also include:

- A statement about the *Do* practices in Years 4-6 and what they comprise (not yet drafted).
- Specific recommendations about teaching practices for Years 4-6 (not yet drafted).
- The *Knows* for Years 4-6, presented year by year, tabulated so the sequence is clear, and with a guidance column that notes any particular content aspects that need highlighting. More in depth information could be included in an appendix. Layout below*:*

	Year Four	**Year Five**	**Year Six**	**Guidance**
Number				
Algebra				
Geometry				
Measurement				
Statistics				
Probability				

This material draws from the current year by year sequence and phase end statements, with some changes to reflect the new emphasis on fluency and arithmetic competence.

Statement of the overall intent at Years 7-8 (draft):

Emphasis on application and generalisation will aid progression in later years. Students will:

- Continue to extend their understanding of the place value number system and develop proficiency working with fractions, decimals, percentages, and ratio.
- Continue to increase their mathematical and statistical vocabulary and use written and oral communication to express their ideas, including correct multi-step mathematical statements.
- By the end of Year 8, have fluent recall of multiplication and division facts up to 12×12 and be able to identify square numbers to at least 196 and cube numbers to at least 125.
- Be fluent in written methods for all four basic operations, including working with decimals and fractions, and understand the order of operations.
- Be proficient with basic algebra skills, e.g. collecting like terms, solving linear equations.

This section will also include:

- A statement about what the the *Do* practices in Years 7 and 8 comprise (not yet drafted).
- Specific recommendations about teaching practices for Years 7 and 8 (not yet drafted).
- The 'Know's for Years 7 and 8, presented year by year, tabulated so the sequence is clear, and with a guidance column that notes any particular content aspects that need highlighting. More in depth information could be included in an appendix. Layout below:

	Year Seven	**Year Eight**	**Guidance**
Number			
Algebra			
Geometry			
Measurement			
Statistics			
Probability			

This material draws from the current year by year sequence and phase end statements, with some changes to reflect the new emphasis on fluency and arithmetic competence.

Statement of the overall intent of Years 9-10 (draft):

- Statement about what the *Do* practices for Years 9 and 10 comprise (not yet drafted)
- Specific recommendations about teaching practices for Years 9 and 10 (not yet drafted)
- The *Knows* for Years 9 and 10, presented year by year, tabulated so the sequence is clear, and with a guidance column that notes any particular content aspects that need highlighting. More in depth information could be included in an appendix. Layout below:

	Year Nine	Year Ten	Guidance
Number			
Algebra			
Geometry			
Measurement			
Statistics			
Probability			

This material draws from the current year by year sequence and phase end statements, with some changes to reflect the new emphasis on fluency and arithmetic competence.

Creating mathematics and statistics programmes:

- How to decide what to teach when, how long to spend on something, how to know when to move on, how to create long term overviews and shorter-term plans.
- How to design a mathematics and statistics hour of learning.
- How to plan and prepare for a mathematics and statistics lesson.
- How to assess formatively and what role that plays in deciding what to do next with students.
- How to deal with a range of student needs and strengths in a whole class teaching approach.

Appendix 4: Literacy Progress Steps and Methods, Samples for Years 0-3

The proposed Literacy Framework has been organised into three strands: Reading, Writing, and Oral Language.

The Reading Strand takes its structure from *The Simple View of Reading*, a seminal model of reading development, according to which reading comprehension is a product of word recognition and language comprehension. The Reading Strand has therefore been organised into two sub-strands: word recognition and language comprehension. Within word recognition, teachers will teach phonological awareness and phonics. Within language comprehension, they will teach vocabulary knowledge, sentence structure, using background knowledge and making connections, literary analysis and critical literacy, and reading literature.

The Writing Strand aligns with the seminal *Simple View of Writing*. According to this model, working memory resources are in high demand during writing, coordinating and managing many subskills, some of which will never be automated. The subskills include text generation (which requires vocabulary knowledge and knowledge of sentence structure), transcription (handwriting, spelling, and typing), and executive function, which entails managing all the demands of original composition, including knowledge of the topic and text structures, and managing the processes of planning, writing, revision and editing.

Informed by the Simple View of Writing model, we are presenting two rubrics: One is for the underlying subskills that must be taught and practised in dedicated time, to reduce cognitive load during composition. These include vocabulary knowledge, sentence structure, handwriting, and spelling. The second rubric is for the compositional skills (text content and form, planning, revising and editing, and work habits).

The Oral Language sample has not yet been developed. We favour something that is simple and succinct – many oral language skills (such as vocabulary knowledge, or the ability to engage in an analytical discussion) will be developed in the context of learning to read and write, and in other curriculum areas too. An example that we favour is found in England's English curriculum, with all the objectives for years 1-6 contained on a single page.[iii]

[iii] https://assets.publishing.service.gov.uk/media/5a7de93840f0b62305b7f8ee/PRIMARY_national_curriculum_-_English_220714.pdf

To enhance practical utility to teachers, progressions are presented alongside teaching methods. Using this format, teachers will be able to see the ‘what’ and the ‘how’ aligned on a single page.

Teaching guides for the Common Practice Model

Points at which teaching progressions or methods require further explanation are marked with an asterisk. In a final version, this could become a numbered footnoting system, referring teachers to more in-depth teaching guides.

Opportunities for integration

While Reading, Writing, and Oral language are different processes, they are also complementary. For example, learning to spell will support decoding, and learning to combine two simple sentences orally will be a starting point for writing compound and complex sentences, and for comprehending these sentences when reading. A related point is that, while we need teachers to teach all of the relevant subskills for each discipline (without any getting ‘lost’), integration across the strands will also be possible. Certain activities will provide opportunities to work on learning objectives from two or more of the strands. For example, teachers may read a story to students to meet comprehension goals, discussing the characters, story-problem and so on, and then have students write their own stories, remembering to include the same elements. We would like to make these possibilities clear to teachers by including sample lesson plans as a key part of the Common Practice Model.

Literacy in Phase 1

In the first three years at school, it is essential that teachers are given licence to focus on the foundational skills of decoding, spelling, handwriting, and working with sentences. These skills must become automatic (or fluent), before students can be expected to think about other things, such as the critical analysis of a text, or applying interesting techniques for describing a story setting. For this reason, the Phase 1 objectives are more comprehensive for the foundational technical skills. When more advanced, higher order thinking skills are introduced in Reading, they are practised in response to a story that has been read to students by the teacher. When more complex idea generation skills are introduced for Writing, they are practised orally in the first instance.

Another important consideration for the first three years is that students should be writing by hand as much as possible. This will benefit both Writing and Reading. Handwriting skill is a strong factor in writing achievement, and handwriting letters and words helps students to remember the patterns for spelling and decoding. Significantly, typing and using letter tiles will not afford the same benefits. Only handwriting activates and strengthens the brain’s orthographic mapping pathway.

The importance of writing by hand must be made clear to teachers, and this may represent quite a change for teachers in some schools. The importance of appropriate furniture (desks and chairs for every student, at the right height) must also be made clear to teachers and principals.

There will, of course, be valid reasons to use assistive technology for students with particular learning challenges. We plan to provide teachers with clear and useful guidance regarding when and how these such technologies could be used.

Phase 1 Reading Sub Strands, Teaching Progressions, and Methods

Rubric One: The Word Recognition Sub Strands

The Phases → The Sub Strands ↓	Phase 1(i) After 6 months at school	Phase 1(ii) After 1 year at school	Phase 1(iii) After 2 years at school	At the end of Phase 1 After 3 years at school	Methods
Phonological awareness This sub strand is about helping students to hear sounds and syllables in words, and words in sentences. The students' ability to work with sounds is a strong factor in reading and spelling achievement.	*Teach students to:* Clap syllables in a word Identify the parts of a compound word Identify the first, last and middle (vowel) phonemes in a single syllable word. Orally blend 2 or 3 phonemes to say a word (c-a-t to cat).	Throughout phase 1, students will continue to practise: segmenting words into sounds to spell; breaking words into syllables to spell; hearing and identifying short, long, and other vowel sounds hearing and identifying consonant sounds blending sounds to read words			During shared reading of poems, talk about first sounds in words, syllables, and rhyming words. Talk about and work with sounds in reading and spelling. Use multisensory activities such as spelling fingers (for segmenting) and clapping, clicking, and dancing (for syllabification). Explain to students that our alphabet was invented to record the sounds of speech. Talk about the difference between vowel sounds and consonant sounds.* Talk about short and long vowel sounds.* See the teacher knowledge guide to assist you with this.*

Phonics and alphabet This sub strand is about connecting speech (phonemes) with their spellings (graphemes).	*Teach students to:* Identify the most letters of the alphabet by name and sound, starting with the letters first introduced in the scope and sequence progressions you are using. Bend to decode and read CVC words using their developing letter-sound knowledge (for example, sat, mad, pot). Decode and read CVC words with the suffix s added (for example, pots). Read early, irregular high frequency words. See the Phase 1(i) list.*	*Teach students to:* Name the letter, and pronounce the single consonant or short vowel sound for all single consonant and short vowel sounds, including the alternative sounds for 'c' and 'g'. Pronounce the sounds of early digraphs: sh, ch, th, ng. Decode and read CVC words using all single letters. Decode and read CVCC words with double letters: -ff -ll -ss -ck (for example, miss, luck). Decode and read CCVC and CVCC words (for example, frog, hand).	*Teach students to:* Recognise and read spellings for long vowel sounds and dipthongs.* Note that these sounds are often represented by vowel digraphs or 'teams' (for example, the oa in boat). Recognise and read less common consonant digraphs and trigraphs (ph, wh, tch, dge). Decode and read words with long vowel sounds, diphongs, and less common consonant digraphs. Read the irregular high frequency words from the Phase 1(iii) list.*	*Teach students to:* Continue to apply phonic knowledge and skills to decode words that are not yet known. Break words into syllables by looking for the vowel pattern.* Read words with a range of more advanced suffixes (ly, est, ness, tion) and prefixes (un, dis, re, un). Read a wide variety of texts, including those at the purple and gold levels of the colour wheel.	Use formative assessment to find out what students know and can do already, and then follow a scope and sequence progression to determine next steps. Use the progression to monitor students' growing knowledge and skill. A decodable book series* supports teaching the early decoding skills. Consider the best book to support the skills you are teaching. Use some whole class teaching to ensure that everyone gets practise with these knowledge items and skills, every day. Teach the knowledge and skills in small groups too. These lessons may be between 10-15 minutes long. Provide many opportunities to decode and spell the graphemes and words you are teaching. Provide opportunities to practise decoding and writing the words in lists and in sentences and decodable books. Continue to practise with new knowledge items, and use repetition across the day and across the week, until you notice that the students are able to use this knowledge with ease and automaticity.

	Read decodable sentences and decodable books.* Decode and read words with short vowels and digraphs (for example, ship, long). Read words with early suffixes -ed, -ing (for example, splashed, splashing). Read the irregular high frequency words from the Phase 1(ii) list.* Read decodable sentences and books. Read some less controlled texts with support when reading words with patterns that have not yet been taught. For example, books from the yellow and blue levels of the colour wheel.	Read a variety of texts including advanced decodable texts* and appropriate levelled texts. For example, books from the orange and turquoise levels of the colour wheel.		Other activities will help to consolidate the knowledge, including daily alphabet chants and games, displaying an alphabet chart on wall for children to see and consult, using classmates' names as motivation to identify a wide range of letters, reinforce alphabet alphabet learning through handwriting, develop a class alphabet book.Provide opportunities for students to read a wider range of (non decodable) texts, as soon as they demonstrate that they are able to decode and read the first CVC words. Select texts that will be engaging for students. When using these texts, tell students the words they are not yet able to decode independently.

Fluency Fluency will develop as a result of proficiency with phonics knowledge and decoding skill. It can also be supported by modelling of fluent reading, and through providing opportunities for repeated practice with reading familiar texts.	*Teach students to:* Read words they know as blended units. After many opportunities to practise, read decodable sentences and books with phrasing. Engage in the shared reading of less controlled texts, reading with phrasing.	Read to students every day, using phrasing and expression. Provide opportunities for shared reading of big books and poems. Provide many opportunities to practise new knowledge and skills, before applying them to reading sentences and books. In small group sessions where children have the decoding skill, use choral, echo, whisper, and partner read techniques* Provide opportunities for students to reread familiar books (decodable books and others).

Rubric Two: The Comprehension Sub Strands

The Phases → The Sub Strands↓	Phase 1(i) After 6 months at school	Phase 1(ii) After 1 year at school	Phase 1(iii) After 2 years at school	At the end of Phase 1 After 3 years at school	Methods
Vocabulary Knowledge	*Teach students the knowledge of:* Word meanings, including words needed to understand classroom routines and to follow instructions. And, words that they encounter while learning across the curriculum and while reading. *Teach students the skills to:* Engage during story reading time. Talk about and ask questions about words and their meanings. Practise using new words in speech and then in writing.			*Teach students the knowledge of:* Meaningful word parts, such as summon suffixes and prefixes. (For example, un means not, so unkind means not kind.) Word meanings, especially for words that are less common and more challenging. These may be topic specific words, or words to express abstract concepts. *Teach students the skills of:* Working out new words from the context of the sentence. Work out new words by thinking about their meaningful parts. Ask questions when they do not know the meaning of a word or word part. Use new words in speech and writing.	Methods for teaching vocabulary for reading are the same as those that can be used to develop vocabulary knowledge for writing, specifically: Model and provide opportunities for students to hear sophisticated language across the day. Teach vocabulary explicitly using picture books from the literature strand.* Teach vocabulary explicitly when teaching in other curriculum areas. Teach words that are somewhat challenging for most of a class. These may be less common words, and/or words which express abstract concepts. These can be described as Tier 2 words.* Set writing and speaking tasks that will provide opportunities fo students to use these new words.*

Understanding Sentence Structure Sentence structure will also be taught in oral language and in writing. In reading, we can use this knowledge to clarify the meaning of a sentence.	*Teach students to:* Identify the subject and verb, or the 'who' and a 'do', in a simple sentence.	*Teach students to:* Identify the subject, verb, and adverbial phrase in a subject sentence.	*Teach students to:* Identify a compound sentence by looking for two or more subject and verb clauses, and conjunctions.	*Teach students to:* Identify and talk about different sentence structures, lengths, and beginnings. Talk about the impact of certain structures. Identify different sentence types, including questions, exclamations, and commands. Discuss the different sentence punctuation needed for questions and exclamations. (? !).	Demonstrate how we can clarify the meaning of a sentence by identifying the subject and verb ('who' and 'do'). Explain that to the subject could be:a living thing, an inanimate object, a group, a name, a pronoun. Demonstrate how we can get extra information about when, where, and how, from adverbial phrases. Discuss interesting sentences during shared reading and when reading to students. Refer to the Writing rubric for methods that will also support sentence structure knowledge for reading and refer to the teacher's knowledge guide to support you with this teaching.*
Using Background Knowledge and Making Connections Background Knowledge is developed across the curriculum, during shared reading, and when teachers read to students.	*Teach students to:* Listen to a story and identify the characters, setting, problem, action, and ending. Listen to a story and talk about how a character is feeling. Listen to a story and predict what might happen next. Listen to non fiction texts and talk about the information.		*Teach students to:* Listen to stories, or read their own stories, and identify the characters, setting, problem, action, and ending. Listen to, or read a story and talk about how a character is feeling, even when it is not directly stated in the text. Make connections to identify and discuss the themes in a story.		Read to students every day. Choose texts from the Reading Spine,* as well as others that are relevant to your class topics and/or the students' interests. When reading stories, talk about: -what happens in the story -whether they enjoyed reading the text or not, and why -who is telling the story

<table>
<tr>
<td>Students will practise applying these skills, first when listening to texts and later when reading to themselves.</td>
<td>Talk about the things they read and relate them to their own experiences.</td>
<td>Listen to, or read a non fiction text and respond with an oral or written GIST statement.*

When talking about texts, justify their opinions by referring to evidence in the text.

When listening and reading to texts, recall relevant experiences and knowledge from their own lives. Use this knowledge to make sense of the text.</td>
<td rowspan="2">When reading picture books, talk about:
-how artistic techniques with colour, symbol, and composition can help tell about a character, plot or theme
-how to use clues in the story (pictures and words) to make connections and infer

When reading non fiction texts, talk about:
-the information
-whether it fits with what we know already about a topic
-what else we know about the topic
-are there other ideas or opinions about the topic that we cannot find in the text

Use interactive read aloud approaches.*

Use dialogic approaches to create discussion.* For example, speaking frames: I think…, The clue I used was…, The character felt…, I think that means…</td>
</tr>
<tr>
<td>Text Analysis and Critical Literacy

Note that there is overlap in the teaching methods for Background Knowledge and Making Connections, and Text Analysis and Critical Literacy.</td>
<td>Teach students to:

When listening to stories and non fiction texts, talk with others about their understanding and opinions.

Listen to others’ opinions and understandings of texts.</td>
<td>Teach students to:

When listening to and reading texts, discuss how certain texts make them feel.
When listening to and reading texts, discuss which people, places, things, and ideas are included.

When listening to and reading texts, discuss which people, places, things, and ideas are excluded.
Students can discuss how people, places, things, and ideas are included or excluded in a text.</td>
</tr>
<tr>
<td>Reading Literature and Reading for Pleasure</td>
<td colspan="2">Support students to:

Engage with high quality children’s literature.
Talk and ask questions about stories, poetry, and plays.
Talk about their favourite stories, and the topics they want to read about.
Choose stories and non-fiction texts for others to read to them, or for them to read themselves.</td>
<td>Read to students every day. Choose texts from the Reading Spine,* as well as others that are relevant to your class topics and/or the students’ interests.</td>
</tr>
</table>

		Consult the National Library as a key resource for learning more about suitable books to use. Ask students about which stories and texts they enjoy reading, and why. Provide opportunities for students to visit the school and public libraries. Show them where they can find the books they may enjoy. Talk to them about the librarian and how he or she can help them to find and issue books.

Phase 1 Writing Sub Strands, teaching Progressions, and Methods

Rubric One: The Underlying Sub-Skills of Writing -

<table>
<tr><th colspan="2">Phases→

The Underlying Sub Skills↓</th><th>Phase 1(i) After 6 months</th><th>Phase 1(ii) After 12 months</th><th>Phase 1(iii) After 24 months</th><th>Phase 1 (end of Year 3)</th><th>Methods (Teachers will)</th></tr>
<tr><td rowspan="2">The Technical Sub Strands of Writing:

These sub strands must be taught explicitly, in their own dedicated time, outside of the main writing (composition) lesson.

Then, the skills must be practised during the writing (composition) lesson too.

These skills will support literacy development generally:

Teaching new vocabulary and teaching about</td><td>Vocabulary knowledge</td><td colspan="3">Teach students to:

Explain the meanings of new words.

Support students to:

Use these words in speech and writing.</td><td>Teach students to:

Understand and use figurative language, in speech and in writing.</td><td>Model and provide opportunities for students to hear sophisticated language across the day.
Teach vocabulary explicitly using picture books from the literature strand.*
Teach vocabulary explicitly when teaching in other curriculum areas.
Teach words that are somewhat challenging for most of a class. These may be less common words, and/or words which express abstract concepts.*
Set writing and speaking tasks that will provide opportunities for students to use these new words.*</td></tr>
<tr><td>Sentence Structures and Punctuation Use</td><td>Teach students to:

Say a simple sentence, with a subject and verb (a ‘who’ and a ‘do’).

Write 1 sentence - with very close support from the teacher.</td><td>Teach students to:

Combine two simple sentences orally - using the coordinating conjunctions and, but, or, so - to compose a compound sentence.

Write 2 or 3 sentences using capital letters and full stops correctly and independently.</td><td></td><td>Teach students to:

Combine two simple sentences orally, using subordinating conjunctions, to compose a complex sentence.

Add a phrase after a clause, to add detail about when, where, or how.

Write 3-5 sentences each day, with</td><td>In phases 1(i) and 1(ii):
Explain what a sentence is, in child-friendly language. It can be: an idea; a complete thought; it has a ‘who’ and a ‘do’.*
Use colourful sentences to colour code subject, verb, and coordinating conjunctions.*
Show students sentences in the books they are reading and the books you read aloud.*
During writing lessons
Model thinking of a sentence and saying it aloud (oral composition).
Use think, pair-share so that students can practise saying their own sentences to a buddy.
Support students to read and check every sentence immediately after writing it.

In phases 1(iii) and 1:</td></tr>
</table>

sentence structures will benefit spoken language and reading development. Teaching spelling and handwriting will support reading development.		Re-read to check the sentence - with support from the teacher.	Note: Sometimes students may wish to write a complex sentence which requires a comma. For example: 'After the tiger ate his food, he went to sleep.' For these sentences, teachers should support comma-use. Re-read to check each sentence as they write.	capital letters and full stops used correctly and independently. Re-read to check each sentence as they write. Note that: Comma use, for certain complex sentences, may still require support from the teacher.	Explain what a sentence is, acknowledging greater complexity: it has a 'who' and 'do' clause, or a clause with a subject and a verb; some sentences have more than one clause - these may be joined with coordinating conjunctions (compound sentences) or subordinating conjunctions (complex sentences).* Use Sentence Combining* Show students sentences in the books you are reading and those you read aloud. Discuss the impact of different structures on the emotion/meaning of the story. Use colourful sentences to colour code subject, verb, coordinating and subordinating conjunctions, and phrases.* **During writing lessons,** continue to model thinking a sentence before writing it, continue to use think, pair share for student practice and continue to support students to read and check every sentence, immediately after writing it.
	Handwriting	*Teach students to:* Form most lower case letters correctly and legibly, in manuscript (print) style. Practise a comfortable sitting posture, a comfortable amount of pressure, and a functional pencil grip.*	*Teach students to:* Form all lower and upper case letters correctly and legibly, in manuscript (print) style. Write each letter on the line. Practise a comfortable sitting posture, a comfortable amount of pressure, and a functional grip.*		Teach handwriting for ten minutes, every day. Show students how to form letters (modelling) and watch them practise. Make sure they are starting in the right place and that their hand is moving in the right direction. If you see an error or confusion developing, intervene and show the student the correct way. Be positive and supportive in these moments. In phases 1(i) and 1(ii), consider using blackboards and chalk, or whiteboards and washable crayons, to support correct tripod grip, comfortable pressure, motor memory, and strength. Regarding pencil grip, teach the tripod grip to beginners. If students have already learnt to write using the quadrupod or stenographer's grip, these are also functional and do not need to be corrected.* Teach in formation groups.* **During writing lessons,** support students with their handwriting during writing time too, to avoid errors and confusions being practised.

	Spelling Spelling knowledge will align somewhat with the code knowledge students are working with in reading. The sequence here lags slightly behind the reading one as students will generally learn to read the words before they are able to spell them.	*Teach students to:* Spell some CVCs and early, irregular, high frequency words: See the Phase 1(i) list.*	*Teach students to:* Spell CVCs and some irregular, high frequency words, independently: See the Phase 1(ii) list.*	*Teach students to:* Spell CVCs with double letters and digraphs. Spell words with adjacent consonants (CVCC, CCVC). Use correct spelling for a growing number of irregular, high frequency words: See the Phase 1(iii) list.*	*Teach students to:* Spell some long vowel patterns independently. Add common suffixes (s, ed, ing) applying spelling rules (doubling the middle consonant after a short vowel, dropping e before ing).	Teach spelling every day, for at least ten minutes. Reinforce spelling during decoding lessons for reading, and vice versa. Teach children to segment words into phonemes and to hear syllables. Teach students to identify vowel sounds and consonant sounds. Use multi-sensory activities, for example, by having students count sounds in words using 'spelling fingers', or by clapping and dancing to syllables. Teach spelling patterns, and spelling rules, methodically - following the Scope and Sequence for Reading and Spelling. * Teach lists of words with the same phoneme-grapheme correspondences (eg, a list of words with the long a spelt with ai), or that require the same rule (words like have/having, give/giving). Teach students to spell irregular, high frequency words too. Use the 'heart words' routine described in the Phase 1 spelling guide for the teaching of irregular high frequency words..* Always discuss and connect to word meanings. Use dictated sentences to help reinforce new spelling knowledge. **During writing lessons,** support students with their spelling. Use the supported spelling routine.* See the more-detailed guide to teaching spelling in Phase 1.*

Rubric 2 - The Compositional Sub Strands of Writing

<table>
<tr><td>Phases→

The Compositional Sub Strands ↓</td><td>Phase 1(i) After 6 months</td><td>Phase 1(ii) After 12 months</td><td>Phase 1(iii) After 24 months</td><td>Phase 1 (end of Year 3)</td><td>Methods</td></tr>
<tr><td>Text Types:

Content

Teach students to include ideas, language features and conventions of style, appropriate for the purpose and audience.</td><td rowspan="3">Teach students to:

Say a sentence inspired by a class topic, a picture book, or an experience.

Towards the end of this Phase 1(i), students may begin to write the sentence down, with close support from the teacher.

Note that: It is important to keep the task manageable while students are developing early skills. One short sentence that keeps the children feeling successful and motivated is better than asking for more detail.</td><td>Teach students that:

Writing has different purposes. For example, stories, to entertain; or reports, to teach and inform.

Stories can include imaginary ideas.

Reports include factual information.</td><td colspan="2">Teach students to:

Apply knowledge of the conventions of style for different text types.

For stories, they will include a problem and resolution.

For reports, they will include only factual information.</td><td rowspan="3">Writing places significant demands on working memory. Four approaches will help to avoid cognitive overload, and will ensure that students remain confident and motivated while learning to write:
Avoid having students write their own sentences before they have phonics knowledge for CVC words and some high frequency words, and are able to form most letters correctly.
Choose one key goal to work on at a time, providing opportunities for students to practise the new skill over a number of consecutive days.
Support young students' writing practice closely. Remind them of conventions of layout (such as spaces between words). Support their spelling using the supported spelling routine.
Ensure that students receive lots of encouragement while they write. Provide specific, positive praise on their ideas, their progress with new knowledge and skills, and their work habits.

Other specific recommendations:

Teach writing at least four times each week.
Plan writing tasks on a range of topics, and for both narrative-writing and report-writing.
Use model texts from the reading programme to introduce students to different text types, structures, and text features.
Begin lessons by modelling writing for your students. The model should be short - 5 minutes/1 sentence in Phase 1(i), up to 10 minutes/3 sentences in Phase 1.</td></tr>
<tr><td>Text Types:

Form

Teach students to organise their writing so that it is appropriate for the purpose and audience.</td><td>Teach students to:

Plan and write a 2 or 3-sentence story or report.</td><td colspan="2">Teach students to:

Write single-paragraph texts, for a purpose. These texts may be 3-5 sentences long.</td></tr>
<tr><td></td><td colspan="2"></td><td></td></tr>
</table>

<table>
<tr>
<td>Writing Processes:

Planning</td>
<td>Teach students to:

Say a sentence to the teacher.</td>
<td colspan="2">Teach students to:

Plan their first sentence by saying it aloud to a friend and/or teacher.

They may plan further sentences independently, thinking at their tables.</td>
<td>Teach students to:

Talk about their ideas with their friends and teachers, before writing.

Then:

To use simple, written planning templates and mnemonics. For example TIDE and POW from SRSD.*</td>
<td rowspan="2">The model should be explicit - show students how to achieve their priority goals.
Show students that we always read and check each sentence, immediately after writing it.
After modelling, give students time to talk about their ideas and practise saying their first sentence. Use think, pair-share to ensure that everyone gets to talk and to listen.
Support students while they write. Phase 1(i) and Phase 1(ii) students will need very close support so it is sensible to work with small groups.
Use supported spelling to avoid too much guessing at words. See the supported spelling guide.*
Praise reading and checking.
Support students to correct errors, using an eraser (the teacher can hold the eraser at first, to avoid students becoming distracted with it).</td>
</tr>
<tr>
<td>Writing Processes
Transcribing
Re-reading
Evaluating
Editing
Revising</td>
<td>Towards the end of Phase 1(i), students may begin to write the sentence down, with close support from the teacher. They are ready to start transcribing when they have sound-letter knowledge for most single consonant and short vowel sounds, and letter formation for most lower case letters.

Then, we will support them to:
Write some letters and words in the sentence they have planned (the teacher can write the rest of the sentence for the student).

Leave spaces between words (with support).

Read and check the sentence (with support).</td>
<td colspan="3">Teach students to:

Write 2-3 sentences, with support from the teacher, especially for spelling.

Begin at the margin and leave spaces between words.

Read and check every sentence immediately after writing it. The sentences need to be grammatically correct, with capital letters and full stops used correctly.

Ask for the rubber when they notice something they want to correct or change.</td>
</tr>
</table>

Work habits	Over the first three years, teachers will support students to: Complete their writing tasks Build stamina for writing Know why they are writing and what they are learning to do Celebrate their progress in writing	Teach good work habits for writing. Set expectations for a quiet classroom. This protects working memory - it is too hard for students to write and talk at the same time. Resources must be well organised and easy for students to find. This is another way to protect working memory - students can become easily distracted if they have to search for their pencil, for example.
UKD: At the end of Phase 1	**Understand:** Students understand that writing is a way to communicate information and ideas; that we write for ourselves and for readers; and that we follow certain conventions to ensure that our message is clear. **Know:** Students know about the features of different text types, especially narratives and reports. Students know what a sentence is. Students know the meanings of a growing number of words to express abstract concepts, and words that are topic specific and precise. Students have growing knowledge of the code of written English, including spelling, punctuation use, and the conventions of layout. **Do:** Students are able to plan and write a single-paragraph text, with some support from the teacher, especially for spelling. Students are able to write different text types: stories and reports. They can plan by talking about their ideas, and by using some simple written planning templates. They follow early conventions of genre and style. Students write in sentences, with capital letters and full stops used correctly and independently. Students spell a growing number of words correctly and independently. Students follow conventions of layout - starting at the margin and leaving spaces between words. Handwriting is legible and letters are formed correctly and easily. INSERT FOUR WRITING SAMPLES HERE, SHOWING THE PROGRESSIONS ACROSS 1(i), 1(ii), 1(iii), 1.	

References

[1] May, S. & Medina, E. (2023). *PISA 2022: Aotearoa New Zealand Summary Report*. Ministry of Education, Wellinton.

[2] Sutcliffe, R., Marshall, N., Rendall, S. & Medina, E. (2020). *TIMMS 2018/19: Mathematics Years 9*. Ministry of Education, Wellington. https://www.educationcounts.govt.nz/__data/assets/pdf_file/0007/205693/TIMSS-2018-Year-9-Mathsb.pdf

[3] Ministry of Education (2023). *Reading literacy at Year 5: New Zealand's participation in PIRLS 2021*. Wellington. https://www.educationcounts.govt.nz/__data/assets/pdf_file/0015/221037/PIRLS-2021-Reading-literacy-Year-5.pdf

[4] Geary D.C. (2024). The Evolved Mind and Modern Education: Status of Evolutionary Educational Psychology. Cambridge University Press, p. 37.

[5] Hoover, W.A. & Tunmer, W.E. (2020). *The Cognitive Foundations of Reading and Its Acquisition*. Spinger.

[6] Gough, P. and Tunmer, W. (1986). Decoding, reading, and reading disability. *Remedial and Special Education, 7*, 6–10.

[7] Berninger, V., Graham, S., Vaughan, K., Abbott, R., Begay, K., Byrd Coleman, K., Curtin, G., & Minich-Hawkins, J. (2002). Teaching spelling and composition alone and together: Implications for the simple view of writing. *Journal of Educational Psychology, 94(2)*, 291-304.

[8] Tomorrow's Schools Independent Taskforce (2019). *Final report by the Tomorrow's Schools Independent Taskforce*, Ministry of Education, Wellington. https://conversation-space.s3-ap-southeast-2.amazonaws.com/Tomorrows+Schools+FINAL+Report_WEB.pdf

[9] Hattie, J., & Timperley, H. (2007). The Power of Feedback. *Review of Educational Research, 77(1)*, 81-112. https://doi.org/10.3102/003465430298487

[10] Elley, W.B. (1992). *How in the world do students read?* Hamburg, Germany: International Association for the Evaluation of Educational Achievement.

[11] Wagemaker, H. (Ed.) (1993). *Achievement in reading literacy: New Zealand's performance in a national and international context*. Wellington: Ministry of Education.

[12] Hood, N., & Hughson, T. (2022). *Now I don't know my ABC: The perilous state of literacy in Aotearoa New Zealand*. Auckland: The Education Hub. https://cdn.theeducationhub.org.nz/wp-content/uploads/2022/03/Now_I_dont_know_my_ABC_final-1.pdf

[13] Ministry of Education (1985). *Reading in Junior Classes*.

[14] Ministry of Education (2003). *Effective Literacy Practice in Years 1 to 4*. Richard C Owen Publishers.

[15] Smith, J. W. A., & Elley, W. B. (1994). *Learning to Read in New Zealand*. Auckland: New Zealand: Longman Paul, p.88.

[16] Clay, M.M. (1987). Learning to be learning disabled. *New Zealand Journal of Educational Studies, 22*, 155-173, p.169.

[17] Chapman, J.W., & Tunmer, W.E. (2019). Reading Recovery's unrecovered learners: Characteristics and issues. *Review of Education, 7(2)*, 237-265. https://doi.org/10.1002/rev3.3121

[18] Buckingham, J. (2019). *Reading Recovery: A failed investment*. Sydney: The Centre for Independent Studies. https://fivefromfive.com.au/wp-content/uploads/2022/07/PP15-RE-BRAND.pdf

[19] Ministry of Education. (2023). *Annual monitoring of Reading Recovery*. https://www.educationcounts.govt.nz/statistics/reading-recovery

[20] Evaluation Associates (2022). *NCEA Te Reo Matatini me te Pāngarau | Literacy and Numeracy Pilot Evaluation: Evaluation Report One*.

[21] Graves, D. (2003). *Writing: Teachers and Children at Work*. Portsmouth: Heinemann.

[22] Parr, J. M., & Jesson, R. (2016). Mapping the landscape of writing instruction in New Zealand primary school classrooms. *Reading and Writing: An Interdisciplinary Journal, 29(5)*, 981–1011.

[23] Walls, H. & Johnston, M. (2023). Teachers' beliefs for the teaching of writing: influences on student progress. *Australian Journal of Learning Difficulties, 28(1)*, 27-54.

[24] Flower, L. & Hayes, J. (1981). A cognitive process theory of writing. *College Composition and Communication, 32(4)*, 365-387.

[25] Cowan, N. (2010). The magical mystery four: How is working memory capacity limited, and why? *Current Directions in Psychological Science, 19(1)*, 51-57.

[26] James, K. & Berninger, V. (2019). Brain research shows why handwriting should be taught in a computer age. *Learning Difficulties Australia, 51(1)*, 25-30.

[27] Mueller, P. A., & Oppenheimer, D. M. (2014). The pen is mightier than the keyboard: Advantages of longhand over laptop note taking. *Psychological science, 25(6)*, 1159-1168.

[28] Ministry of Education (2022). *Literacy & Communication and Maths Strategy*. https://assets.education.govt.nz/public/Documents/Ministry/Changes-in-education/ELS-0778-Maths-and-Literacy-Strategies-Doc_web.pdf

[29] Cheung, A.C.K. & Slavin, R.E. (2016). How Methodological Features Affect Effect Sizes in Education. *Education Researcher, 45(5)*, 283-292.

[30] de Boer, H., Donker, A.S. & van der Werf, M.P.C. (2014). Effects of the Attributes of Educational Interventions on Students' Academic Performance: A Meta-Analysis. *Review of Educational Research, 84(4)*, 509-545.

[31] Johnston, M. & Macintyre, B. (2023). *Class Divides? The impact of streaming on educational achievement and equality*. The New Zealand Initiative. https://www.nzinitiative.org.nz/reports-and-media/reports/class-divides-the-impact-of-streaming-on-educational-achievement-and-equality/document/830

[32] Christie, F. and Macken-Horarik, M. (2007). Building verticality in subject English, in F. Christie and J. R. Martin (Eds.), *Language, Knowledge and Pedagogy: Functional Linguistic and Sociological Perspectives*. London and New York: Continuum, 156-183.

[33] Rata, E. (2021) Context and Implications Document for The Curriculum Design Coherence Model in the Knowledge-Rich School Project. *Review of Education. 9(2)*, 496-499. DOI: 10.1002

[34] Daffern, T. (2024). Teaching writing conventions. In Rata, E. (Ed.), *Research Handbook on Curriculum and Education*. Edward Elgar Publishing. Chapter 16. pp. 228-244.

[35] Johnston, M. & Martin, S. (2023). Who Teaches the Teachers? Reforming Initial Teacher Education in New Zealand. The New Zealand Initiative. https://www.nzinitiative.org.nz/reports-and-media/reports/who-teaches-the-teachers/document/820