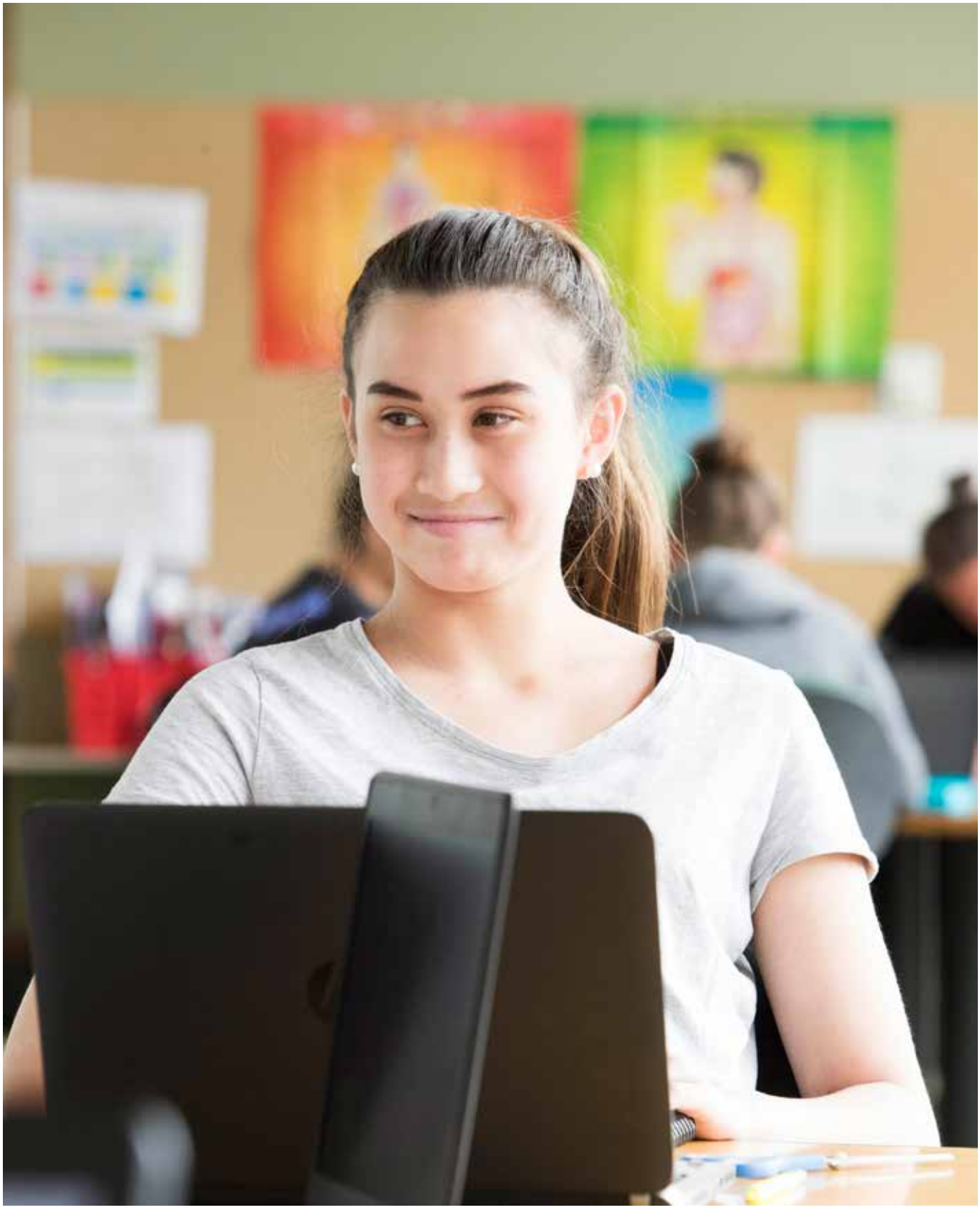
TE TĀHUHU O TE MĀTAURANGA
MINISTRY OF EDUCATION

Draft for Consultation

Hangarau Matihiko
English version



Published 2017 by the Ministry of Education
PO Box 1666, Wellington 6011, New Zealand

www.education.govt.nz

All rights reserved
Copyright © Crown 2017

Draft

Minister's Foreword

Tēnā tatou katoa

New Zealanders are now living in a digital society. Our young people need to be confident and fully equipped to contribute and flourish in the economy of the future.

Many of our young people are already 'digital natives', born into an age where computers, mobile devices and the Internet are so familiar they cannot imagine life without them. But the digital world is fast moving and ever changing. Young people need to keep ahead of this change, understand the theory and science behind the technologies they use, and be able to participate in the digital world as the creators – not just users – of innovations and inventions.

We also need to prepare them now to adapt to technology and jobs that have not yet been invented – robotics, artificial intelligence, nanotechnology, and advances in connectivity all offer the potential to revolutionise business and industry.

New learning in Digital Technologies | Hangarau Matihiko will equip our young people for this digital future. A quality curriculum empowers our children to be the best they can possibly be, bolsters their understanding of the world around them, and expands what they experience at school. It reflects the needs of the learner, their family and whānau, and our society as a whole.

As tomorrow's business leaders, data scientists, artists, health workers, chefs, engineers, user experience designers, urban planners, farmers or navigators, creating and developing digital technologies will be a core requirement for success. The new curriculum will enable students to learn the foundations of digital technologies and better understand how it's connected to other fields of learning from all the way from Year 1 to Year 13.

It is critical that we enable our children to succeed, from their first year in school or kura.

A curriculum is effective only if we equip skilled teachers to deliver it. While the new curriculum introduces opportunities for students, it also presents exciting change for the teaching workforce. Many New Zealand schools and kura already teach digital skills as part of their curriculum, and these changes will enable them to build on this.

It is essential for parents, whānau, Communities of Learning | Kāhui Ako, schools and kura to work together and make a contribution to the ongoing development of our curriculum. Your input will be important to ensure that the content will suit the learning needs of our children and young people.

I am excited to present the new Digital Technologies | Hangarau Matihiko curriculum content. I thank the experts who helped to design, develop and test it. I acknowledge the teachers, kaiako and leaders who will bring it to life for, and with, our young people.

The new curriculum has the potential to be the ultrafast broadband of learning. Working together will ensure the very best and brightest futures for young New Zealanders now and into the digital age."

Ngā mihi,

Hon. Nikki Kaye
Minister of Education

Contents

Learning and thriving in a digital world 4

How to be involved 5

How the Hangarau wāhanga ako has changed 6

1. New Statement for the Wāhanga Ako Hangarau 8

2. Outcome Statements for Computational Thinking for Digital Technologies 12

3. Outcome Statements for Designing and Developing Digital Outcomes 14

4. Outcomes Statements for Concepts of Digital Technology 16

5. Outcome Statements for People and Computers 18

6. Progress Outcomes for Computational Thinking for Digital Technologies 20

7. Progress Outcomes for Designing and Developing Digital Outcomes 24

8. Concepts of Digital Technology and People and Computers 26

9. Exemplars for Concepts of Digital Technology 30

10. Appendix 38

Learning and thriving in the digital world

New Zealand is a digital nation. Digital technologies are transforming how we live; shaping our homes and our workplaces, changing the way that we interact with each other and love our everyday lives.

Our education system needs to change how we prepare our children and young people to participate, create and thrive in this fast-moving digital world.

Incorporating digital technologies will support young people to develop the confidence and skill not only to use digital technologies (DT) but to design and build digital systems.

These developments expand human possibilities by addressing needs and realising opportunities to meet new and emerging societal needs. Technology is much more than designing and making technological outcomes, it involves critiquing past, existing and possible future technologies, while considering their environmental, social and cultural impact. For the first time the learning in digital technologies is explicit within the learning area.

From 2018, Digital Technologies | Hangarau Matihiko will be strengthened in *The New Zealand Curriculum* and *Te Marautanga o Aotearoa*, starting at Year 1.

Draft

How to be involved

This document summarises how the DT | HM curriculum content will look when incorporated into Te Marautanga o Aoteraoa. The content will continue to be refined throughout the year, and all the materials attached are in draft form.

This development reflects the effort of a number of leading curriculum and Technology Area experts across the country, including teachers, kaiako, leaders and representatives from subject associations. These experts have identified the key technological areas that provide the clearest framework for illustrating student progression in Technology.

Our priority is to ensure that the new curriculum content will work for teachers, kaiako, schools and kura, so our learners can achieve the best possible learning outcomes. We need your feedback to ensure we have got it right.

Your feedback will also be invaluable for determining the supports leaders and teachers will need to effectively implement the new curriculum content in their Kāhui Ako, schools and kura. There will be opportunities around the country to learn more and provide feedback over July and August 2017.

Feedback can also be submitted online via an online survey at:
https://education.govt.nz/hangarau-matihiko-consultation

Or by email to:
digi.tech@education.govt.nz

When you provide feedback we encourage you to consider the following questions:

Consistency

- To what extent does the updated Technology Learning Area reflect the vision of *Te Marautanga o Aotearoa*?

Connections

- To what extent are the linkages between the proposed new content and the rest of the Hangarau clear?
- How might we reflect digital technologies learning in the name of the Technology Learning Area?

Adaptability

- How useful is the consultation material in considering how to integrate and adapt the proposed DT | HM content to design local curriculum for your students?

Clarity

- In relation to the consultation material, how easy to understand was:
  - How all the elements of the changes fit together?
  - How the elements of the changes fit with the existing Hangarau Learning Area?
  - The various parts of the proposed new curriculum content?

Coherency

- Consider whether the proposed new curriculum content:
  - Helps me to understand student progress in Computational Thinking for Digital Technologies
  - Helps me to understand student progress in Designing and developing digital outcomes

Future Focus

- To what extent do you agree that the proposed new content ensures students have the skills, knowledge and capabilities they need to fully participate in the 21st century and beyond?
- To what extent do you agree that the intent and direction of the proposed new content will have a positive impact on students' competencies in thinking, using language, symbols and texts, and participating in and contributing to communities of the future?

Making use of the new curriculum content

- What do you anticipate being the biggest challenge in teaching and integrating the DT | HM curriculum content into teaching programmes?
- What support do you think you might need to strengthen your teaching practice across the Technology Learning Area?

How the Hangarau wāhanga ako has changed

The Hangarau wāhanga ako was first developed with five Aho (2008)

- Hangarau Koiora
- Te Tuku Mōhiohio
- Ngā Hanga me ngā Pūhanga Manawa
- Te Tāhiko me te Hangarau Whakatina
- Hangarau Kai

The inclusion of Hangarau Matihiko (2017) lead the reference group to the decision to embed Te Tuku Mōhiohio into the new aho - Hangarau Matihiko.

Hangarau Matihiko then created a ripple effect on the front end of the wāhanga ako. This lead to the reshaping of the Iho, Te Whaitake o te Ako i te Hangarau, Te Hanga o tēnei Wāhanga Ako, Ngā Āhuatanga o te Hangarau and Te Whakaharatau Hangarau to ensure that Hangarau Matihiko was visible and had whakapapa to the front end of the Wāhanga Ako.

These changes are illustrated below:

CURRENT STRUCTURE OF TE WĀHANGA AKO HANGARAU	REVISED STRUCTURE OF TE WĀHANGA AKO HANGARAU
Iho	Revised to reflect inclusion of Hangarau Matihiko
Te Whaitake o te Ako i te Hangarau	Revised to reflect inclusion of Hangarau Matihiko
Te Hanga o tēnei Wāhanga Ako	Revised to reflect inclusion of Hangarau Matihiko
Ngā Āhuatanga o te Hangarau	No changes
Te Whakaharatau Hangarau	No changes
Hangarau Koiora	No changes
Te Tuku Mōhiohio	Revised and embedded in Hangarau Matihiko Dual • Computational Thinking • DDDO Unique to Māori medium • Ngā Ariā o te Hangarau Matihiko Arareo Māori • Te Tangata me te Rorohiko
Ngā Hanga me ngā Pūhanga Manawa	No changes
Te Tāhiko me te Hangarau Whakatina	No changes
Hangarau Kai	No changes

Introducing Progress Outcomes to Hangarau

Learning in hangarau matihiko will be charted by reference to a set of progress outcomes. These progress outcomes are clear and discrete descriptors of the significant steps learners take as they progress. This is a new approach for Māori medium

The progress outcomes recognise that there are key points in a learner's journey irrespective of curriculum level or year level. At this stage we expect the Hangarau wāhanga ako to have the progress outcomes for *Computational Thinking in Digital Technologies* (covering algorithms, programming and data representation), and D*esigning and Developing Digital Outcomes* (covering digital applications and digital systems) Ngā Ariā o te Hangarau Matihiko Arareo Māori and Te Tangata me te Rorohiko

When looking at programming (in the *Computational Thinking in Digital Technologies* technological area), we might see how students develop learning from programming simple instructions in a non-digital environment (eg, stepping out a sequence), to developing software or programming robots. Similar growth in learning can be noticed as students develop in each of the progressions. These progressions will be supported by examples of rich teaching and learning activities in everyday classroom programmes.

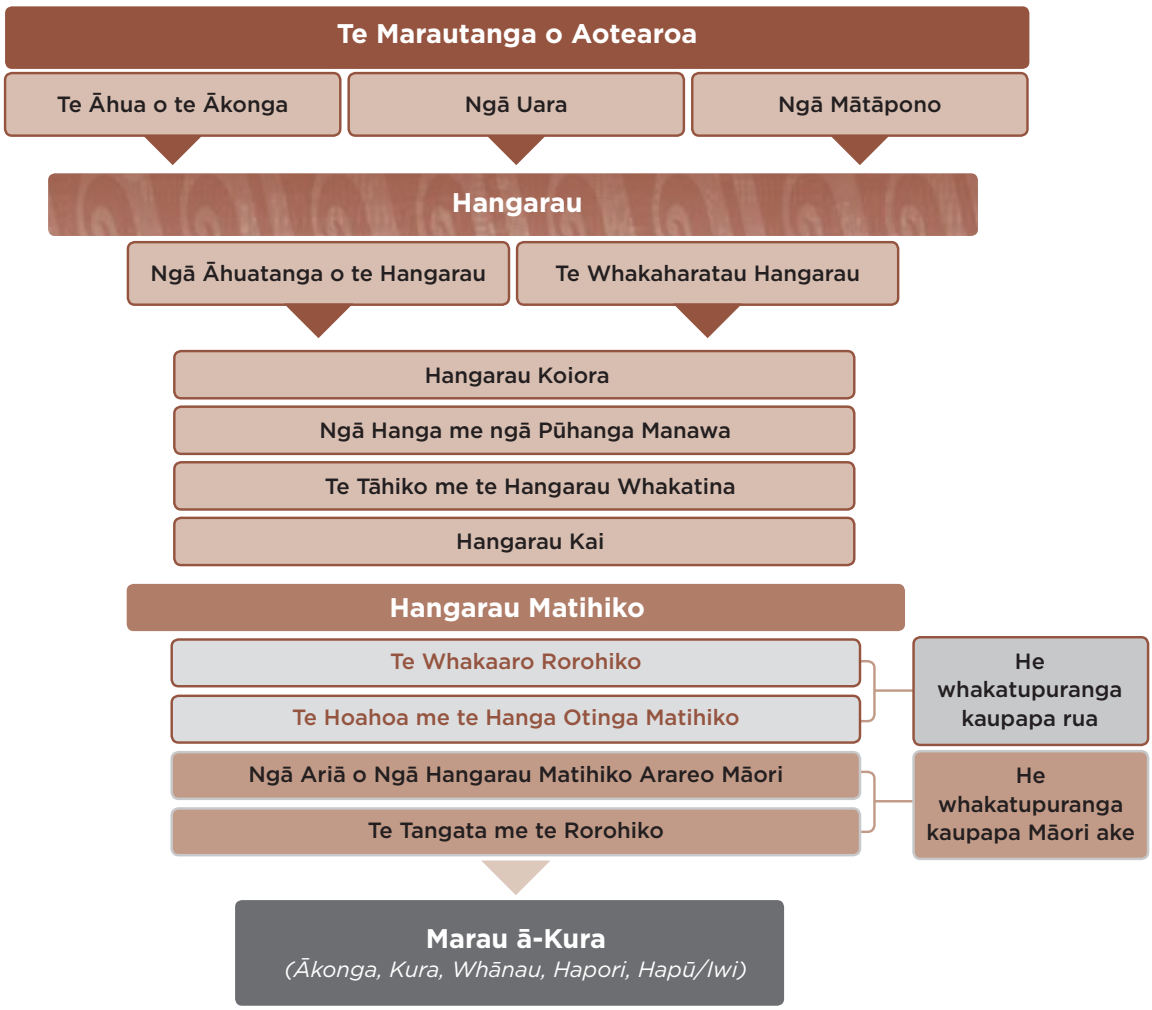
Outcome Statements

These statements describe expected learning at the end of years 10 and 13 for *Computational Thinking for Digital Technologies* and *Designing and Developing Digital Outcomes*. They draw from the learning described in the progressions and represent the skills, knowledge and attitudes of a digitally capable learner.

Learning Area Statement

The current Hangarau Learning Area Statement describes the essential purpose for learning in Hangarau, specifically answering the questions of why study hangarau and what it is about.

This has been revised to make more explicit expectations for learning in Hangarau Matihiko, from school entry to end of Year 10.



Draft for Consultation

1. New Statement for the Wāhanga Ako Hangarau

Draft

Te Iho

The essence of technology is in this chant. From The Characteristics of Technology and The Technological Practices of our ancestors, to the processes of the modern world, our ancestors have laid out a path for us to follow. Let the student swim the current of the ocean of technology. That will be fulfilled by inquiry, discussion, modification, and trialling in order to continuously preserve, make relevant, and update going forward.

Take hold from antiquity
From the distant past
The knowledge of the ancestors
To carry us in this enduring world
The mat woven by them has already been laid
Discuss, dissect, to resolve
Research to remember
Desire to attain
Unique Māori understandings of knowledge

The Relevance of Learning Technology

Technology subjects must be relevant so they are not studied for no real purpose. Through technology, students are enabled. To gather technology understandings, we begin in the Māori world and its relevance to the modern world. They should focus on the values, then skills, and the learning's of technology that they are familiar with.

The Structure of this Learning Area

There are two strands, Primary Concepts of Technology and Technological Practice.

From these, six technology learning areas are derived. Food Technology, Biotechnology, Construction and Mechanical Engineering, Sending Information, Electronics and Control Technology, and Digital Technology too.

It is appropriate to explore the characteristics of different resources in each technology topic. Further, there is another place for serious consideration of process and production. Those parts are in the design plan of the student.

Each strand has different learnings. The two strands need to be joined to the selected learning areas as a foundation for the technology work.

The learning areas proceed from the broader subject to assist. There are possibly two to three learning areas that are relevant. Digital Technology are connected to all learning areas and learning subjects.

Assessment should correspond to the aims in the strands.

Characteristics of Technology

Technological practice is demonstrated by:

- the people and all of their characteristics;
- the needs and the available pathways of the wider world.

Students research and investigate to understand peoples' values and beliefs, and to understand the effect of those characteristics on formulating technology.

To know how to protect land and the environment, and the connection between technology practice and the community. The divine gene and the human gene co-exist in people and land.

Sustainability practices of the ancestors right up to the present need to be considered. The impacts of technological products on our Earth Mother and our Sky Father need to be thoroughly examined.

The land endures, people perish.
The land endures, people flourish.

Draft

Technological Practices

In this strand, technological understandings and skills are strengthened.

Technological practice is the culmination of the knowledge and skills that produce an outcome.

In most technological developments, communities of practice are established, from the outset of design through to completion and beyond. These communities are tremendously relevant to the development, and also the implementation of solutions, and the progress of new technologies.

Design Thinking

This is a path toward completion with five principal parts. Page 9

1. Dedication - to people and their thoughts and feelings and knowing the users and their needs.
2. Define - the major issues and the available pathways.
3. Propose ideas - formulating concepts, and outcomes/solutions.
4. Original model - construct an original model.
5. Experiment - test the model and adapt correspondingly.

Design thinking is essential to all technology advancements undertaken by students.

Draft

Draft for Consultation

2. Outcome Statements for Computational Thinking for Digital Technologies

Draft

Outcome Statements – Computational Thinking for Digital Technologies

In addition to the progress outcomes, the learning progressions are defined by two Outcome Statements, which represent the skills, knowledge and attitudes of a digitally capable learner at the end of Year 10, and of a learner on the path to specialisation in one or more areas of digital technologies at the end of Year 13. These are the bookends for NCEA, representing the start and end points for learners at senior secondary level.

These draft outcome statements are the basis for the reviewed NCEA Level 1 achievement standards for Digital Technologies | Hangarau Matihiko.

END OF YEAR 10	END OF YEAR 13
Students understand that there can be multiple algorithms for the same problem, some are better than others, and by recognising patterns between problems they can generalise known algorithms so they can re-apply these.	Students can analyse a selection of areas of computer science (e.g. formal languages, network communication protocols, complexity and tractability, artificial intelligence, graphics and visual computing, big data) in relation to how the area is underpinned by the key ideas of algorithms, data representation and programming.
Students can independently decompose problems into algorithms and distinguish between algorithms and computer programs.	They can evaluate how the synthesis of these key ideas is applied effectively when developing real world applications.
They can implement algorithms by creating programs which uses inputs, outputs, sequence, loops and selection using comparative operators and logical operators.	Students can use an accepted software engineering methodology to design, develop, document and test a complex computer program.
Students can explain/document their programs and use an organised approach for testing and debugging.	
Students understand how computers represent different types of data using binary digits and can use variables of different data types within their programs.	

Draft for Consultation

3. Outcome Statements for Designing and Developing Digital Outcomes

Outcome Statements – Designing and Developing Digital Outcomes

END OF YEAR 10	END OF YEAR 13
Students will be able to use a range of software to develop and combine digital content to create an outcome. They can work through an iterative process to design, develop, create, store, test and evaluate digital content that meets its purpose. They will recognise social and end-user considerations that are relevant when developing digital content. They will be able to make decisions (largely independently) about appropriate tools/techniques, software and file types to use when developing digital outcomes, and be able to explain their decisions. Students understand the role of operating systems in managing personal computer hardware, security, and application software. They can apply file management conventions when creating and storing digital content and use a range of appropriate storage devices.	Students can work independently or within collaborative, cross-functional teams to effectively apply a refined, iterative development process to develop quality, fit-for-purpose digital outcomes that meet design specifications. They will synthesise social and end-user considerations that are relevant to the outcome when developing digital content. Student developed outcomes will integrate specialised knowledge of digital applications and systems from a range of areas: • LAN (local area network) architecture • Internet of Things (development of a system of interrelated computing devices, hardware and applications) • complex electronics environments and embedded systems • digital information systems • user experience design • complex management of digital information • creative digital media

Draft for Consultation

4. Outcomes Statements for Concepts of Digital Technology

Draft

Taumata Mātauranga mo Ngā Āria o ngā Whakatupuranga Hangarau Matihiko Arareo Māori(Concepts of Digital Technology)

END OF YEAR 10	END OF YEAR 13
Digital Technology students demonstrate and promote how to implement Māori values, knowledge and education. They have begun and are confident in using a range of relevant curriculum terms and phrases of Digital Technology literacy.	Digital Technology students hold fast to and appropriately use Māori values, knowledge, and education in all relevant activities. Their use of a range of curriculum and contextual language of Digital Technology literacy is confident, competent, fluent and proficient.

Draft

Draft for Consultation

5. Outcome Statements for People and Computers

Draft

He Taumata Mātauranga mō te Tangata me te Rorohiko

END OF YEAR 10	END OF YEAR 13
Students are participating digital citizens. They are aware of the importance of learning pathways to guide their pursuit of digital technology careers, careers and digital technology in their world, nationally and globally. They review technology design issues with the solutions already identified and prepared to improve use.	Students are confident and knowledgeable contributing digital citizens. They settle on the digital technology career choices, careers and many digital technologies of their world, nationally and globally, and decide on relevant careers for themselves. They research and analyse the characteristics pertaining to planning decisions and the types of technology that will be used. They analyse and relate the outcomes to improving use. They analyse, review and use the essential principles of running activities.

Draft for Consultation

6. Progress Outcomes for Computational Thinking for Digital Technologies

Computational Thinking for Digital Technologies Progression

Listed below are the eight signposts proposed, at this stage in the development, for the computational thinking for digital technologies learning progression. The design and writers oversight team estimates that signposts 1 to 5 are most likely to reflect learning in the first 10 years of school, whereas signposts 6 to 8 represent learning in senior secondary. Examples of exemplars from sign post 1-5 in computational thinking are included below.

Signpost 1

Students break down a simple non-computerised task into a set of precise, unambiguous, step by step instructions (algorithmic thinking). They are able to give these instructions, and identify if they have gone wrong and correct them (simple debugging). By doing this they show that they can use their decomposition skills to take a task and break it down into its smallest steps.

Signpost 2

Students understand that an algorithm is a step-by-step process to solve a problem, that we can use these to write computer programs, and these programs need to have precise and unambiguous instructions so that the computer can follow them. Students can give, follow, and debug simple algorithms in both computerized and non-computerized environments. They can use these algorithms to create a simple program involving input, output and sequencing in an age-appropriate programming environment.

Signpost 3

Students understand what algorithms are, the difference between algorithms and programs, and that there can be more than one algorithm for the same problem. They are able to decompose problems into step-by-step instructions to create an algorithm for a computer program, and use logical thinking to predict the behaviour of these programs. They are able to develop and debug simple programs that use inputs, outputs, sequence and loops. Students understand that computers store data using just two states, represented by binary digits (bits).

Signpost 4

Students can decompose a problem to create an algorithm using three building blocks of programing: sequencing (putting instructions one after the other), selection (choosing which part of the algorithm to execute based on some values), and iteration (repeating part of the algorithm with a loop). They can implement the algorithm by creating a program that uses inputs, outputs, sequencing, loops and basic selection using comparative operators.

They can debug simple algorithms and programs by identifying if things have gone wrong with their instructions, correcting them, and are able to explain why it went wrong and how they fixed it. Students understand that computers can represent data with binary digits, and that computers have a way to detect errors that have occurred in data storage and transmission. Draft as of 4 May 2017 To be updated following exploratory trials and psychometric analysis Students evaluate different algorithms in terms of their efficiency as they recognise that computers need to search and sort a lot of data.

Signpost 5

Students can independently decompose problems into an algorithm that is articulated in such a way that a computing device can understand. They can implement the algorithm by creating a program which uses inputs, outputs, sequencing, loops, variables of different data types, and selection using comparative operators and logical operators. Students can determine when to use different types of control structures. Students can explain/document their programs and use an organised approach for testing and debugging. Students understand how computers store more complex types of data using binary digits.

Signpost 6

Students are able to determine and compare the cost (computational complexity) of two different iterative algorithms for the same problem size (searching and/or sorting) in relation to the number of comparisons and time taken. Students understand the concept of coding information (e.g. compression, encryption, error control), typical uses of coded information, and how widely used technologies are enabled by coding. Students are able to apply a modular structure to a program to make it more efficient and store data in collections.

Signpost 7

Students understand that some computational problems cannot be solved by algorithms, and that some are intractable (no machine exists that has the power to execute the algorithm) so we need to use a heuristic solution. Students can discuss the purpose of a selection of data structures and evaluate the use of a data structure in terms of tradeoffs between performance and storage requirements and their suitability with different algorithms. Students can use an iterative process to design, develop, document and test an advanced computer program.

Signpost 8

Students can analyse a selection of areas of computer science (e.g. formal languages, network communication protocols, complexity and tractability, artificial intelligence, graphics and visual computing, big data) in relation to how the area is underpinned by the key ideas of algorithms, data representation and programming. They can evaluate how the synthesis of these key ideas is applied effectively when developing real world applications. Students can use an accepted software engineering methodology to design, develop, document and test a complex computer program

Draft

Draft for Consultation

7. Progress Outcomes for Designing and Developing Digital Outcomes

Draft

Designing and Developing Digital Outcomes Progression

Listed below are the five signposts proposed, at this stage in the development, for the Designing and Developing Digital Outcomes progression. The designers and writers estimates that signposts 1 to 3 are most likely to reflect learning in the first 10 years of school, whereas signposts 4 and 5 represent learning in senior secondary.

Signpost 1

Can participate in a teacher-led development to create, manipulate, store, retrieve and share content.

This includes:

- Identifying digital devices and their purpose and knowing that humans made them.
- Identify the inputs and outputs of a system.
- An awareness of some applications and their purpose (face-time, draw studio).
- An understanding that computers store content and we can retrieve it later

Signpost 2

Given some parameters/criteria and tools and/or techniques they are able to make decisions (largely independently) about creating, manipulating, storing, retrieving, sharing and or testing content (developed for a specific purpose) within a fundamental system.

This includes:

- Understand that digital devices develop/change over time & the influence/impact they have on humans/society.
- Understand the particular roles of components in a fundamental input, process, output system and how they work together.
- Understanding that inputs are transformed into outputs within a fundamental system and the "control" role that humans have in this.
- Purposefully use an increasing range of applications (software and file type).

Signpost 3

Given some parameters they are able to make decisions (largely independently) about the best tools/techniques to solve the problem. They work through an iterative process to design, develop, create, store, test and evaluate digital content that meets its purpose.

This includes:

- Select appropriate software and file types for particular purposes based on key features, and justify selection. Use selected software to develop and combine digital content to create an outcome.
- Understand the role of operating systems in managing personal computer hardware, security, and application software. Explain the conventions of file management procedures and use of storage devices.

Signpost 4

Able to independently work through an iterative process to design, develop, create, store, test and evaluate digital content that meets its purpose.

Note: In the continuum between signpost 4 and 5 there is increasing flexibility, confidence, improved optimisation of tools and techniques and applying more specialised contexts.

Signpost 5

Able to integrate their knowledge of digital applications and systems to plan, design, develop/test and create quality, fit-for-purpose digital outcomes that meet design specifications.

This includes:

- Understanding the hardware components, protocols, and network architecture, used in a Wide Area Network (WAN) and apply this to assemble, configure, and manage a WAN.
- Discussing, designing, constructing, and debugging complex electronic environments and embedded systems in terms of their sub-systems and programming structures.
- Understanding how an information system adds value to an organisation. Explaining the interaction of the main components of an information system (hardware, software, data procedures and people) and the importance of end-users and security management.
- Effectively applying an iterative software engineering process to develop digital outcomes.

Draft for Consultation

8. Concepts of Digital Technology and People and Computers

Draft

Draft

Concepts of Digital Technology and People and Computers

	AT THE END OF YEAR 4: LEVELS 1-2 OF TMOA	AT THE END OF YEAR 8: LEVELS 3-4 OF TMOA	AT THE END OF YEAR 10: LEVEL 5 OF TMOA
Concepts of Digital Technology	Digital Technology students demonstrate how to implement Māori values, knowledge and education. Some relevant terms and phrases of Digital Technology literacy are also used.	Digital Technology students use Māori values, knowledge and education. They have begun and are confident in using a range of relevant curriculum terms and phrases of Digital Technology literacy.	Digital Technology students demonstrate and promote how to implement Māori values, knowledge and education. They have begun and are confident in using a range of relevant curriculum terms and phrases of Digital Technology literacy.
People and Computers	Students define their existence as digital citizens and explain the characteristics that are relevant. They have developed their competence in the activities people carry out in the community, and have developed their ability to teach/learn digital communication technology and to contribute to their world. They identify and also support technology design matters and responses to those matters.	Students define their existence as digital citizens and explain the characteristics that are relevant. They are aware of the connection between teaching/learning and work, and they develop their digital technology communication skills to contribute to their world, to the country and to the global community. They explore matters and solutions of technological design already identified.	Students are participating digital citizens. They are aware of the importance of learning pathways to guide their pursuit of digital technology careers, careers and digital technology in their world, nationally and globally. They review technology design issues with the solutions already identified and prepared to improve use.

Draft

AT THE END OF YEAR 11: LEVEL 6 OF TMOA	AT THE END OF YEAR 12: LEVEL 7 OF TMOA	AT THE END OF YEAR 13: LEVEL 8 OF TMOA
Digital Technology students hold fast to Māori values, knowledge and education. Their use of the range of curriculum and contextual language of Digital Technology literacy is confident, fluent and proficient.	Digital Technology students hold fast to and appropriately use Māori values, knowledge, and education in all relevant activities. Their use of a range of curriculum and contextual language of Digital Technology literacy is confident, competent, fluent and proficient.	Digital Technology students hold fast to and appropriately use Māori values, knowledge, and education in all relevant activities. Their use of a range of curriculum and contextual language of Digital Technology literacy is confident, competent, fluent and proficient.
Students are participating confident digital citizens. They are aware of the importance of learning pathways to guide their pursuit of digital technology careers, careers and digital technology in their world, nationally and globally. They illustrate, and explain the characteristics pertaining to design decisions and the types of technology used to improve use. They illustrate and explain the essential principles of organising action.	Students are confident and knowledgeable digital citizens. They investigate the range of digital technology careers and careers with digital technology in their world, nationally and globally. They illustrate, and explain the characteristics pertaining to design decisions and the types of technology used to improve use. They analyse, review and use the essential principles of running activities.	Students are confident and knowledgeable contributing digital citizens. They settle on the digital technology career choices, careers and many digital technologies of their world, nationally and globally, and decide on relevant careers for themselves. They research and analyse the characteristics pertaining to planning decisions and the types of technology that will be used. They analyse and relate the outcomes to improving use. They analyse, review and use the essential principles of running activities.

Draft

Draft for Consultation

9. Exemplars for Concepts of Digital Technology

Draft

Draft

Exemplar 1

A Shapely Network

Strand: Process, Show data
Level: 1 and 2

Concepts of Māori Language Digital Technology Developments

The Digital Technology student demonstrates how to implement Māori values, knowledge, and education. Appropriate vocabulary and phrases of Digital Technology literacy are also used.

The Learning Context

That students search for the longest path in a network by following a rule.

The teacher's role is to teach a process for explaining the practice of a rule to be followed by the student, for example, from a rectangle to a triangle to a circle and back again. Students predict how many changes are possible in the network, and search for the longest path in that network. The protocols of the database and understanding of the links to mathematics are researched. Students should become accustomed to aspects of constructing and applying processes, and correcting them if there are errors.

In this video one sees:

- the connection of the basis of Coding, i.e. the Process.
- children learning aspects of a network and gaining understanding of the rule of the process to correctly complete the activity.
- children collecting data relating to the types of beginnings possible with a network.
- the connection of Digital Technology to Te Marautanga o Aotearoa, namely, to Te Reo Māori and also Literacy.
- children following instructions, and giving instructions for the longest path in a network through following the rule.

Discussion

Students explore the structure of networks.

- How many changes of the rule are possible?
- How many shapes are there in total?
- How many groups? How many columns?
- Is it possible to use all the combinations?
- What is the strategy? Where does it begin?
- Working in pairs: explain to your partner the longest path you searched for.
  - How to explain the first base?
  - How to explain the shifts of the path?
  - How to explain the changes in the network to follow a new path?

Where To Now?

For this student to continue developing, focus on:

- Exploring the use of the processes to arrange and analyse data.
- Using various types of code-writing applications to transfer student instructions to a code environment
- Other process activities to seek the shortest path.

Links to Digital Technology

The student is able to:

- thoroughly analyse a rule;
- discuss the possible results;
- follow and apply a process;
- formulate strategies to produce results;
- collect data on the paths followed;
- follow and give instructions to someone else;
- make corrections when s/he make errors.

Links to the Curriculum

Characteristics of Technology

1. Communicate about the connection of people and the environment, that is:
   - Explain the values used by people. (T2)

Technological Practice

2. They communicate and support their wants as a basic plan, i.e:
   - a process to begin building with. (T1)

Draft

3. They test and evaluate the results on the basis of the nature of:

   - the intended or available means. (T2)

Links to Mathematics

Number and Algebra

The simple strategies for multiplication, division and choosing simple fractions for whole numbers.

Patterns and Relationships

Supplementary patterns, basic multiplication patterns, and geometry patterns and relationships the patterns within multiplication partitions of a number.

Position, Direction and Transformation

Grids, ordered pairs, the main directions and basic maps to show location, procedure, and basic transformation

Resources

NRICH enriching mathematics. A Shapely Network. Stage: 2.

EXEMPLAR 2

Following Maps by Releasing Code

Strand: Coding, Digital Devices, Digital Applications
Level: 3 and 4

Concepts of Māori Language Digital Technology Developments

The Digital Technology student uses Māori values, knowledge and education. The student has begun and is confident in their use of a range of complex vocabulary and phrases relating to Digital Technology literacy.

The Learning Context

Writing a code so a robot goes correctly from home to the marae.

The role of the teacher is to assist students to prepare and lay out the land map and arrange the instructions. Their role is also to show useful applications appropriate for the technological skills of the student.

In this video one sees:

- the links of Coding to Writing and Mathematics
- the ease of preparing a land map as a path for a robot.
- children practicing coding skills: sequencing instructions, correcting code errors, sending code with an iPad
- some 'hidden' benefits of digital devices, namely, getting students to talk, working alone and in pairs.
- the fun and ease of operating robots with code.

Discussion

- Is the sequencing of the actions correct?
- What difficulties emerged while you were sending code with an iPad?
- What difficulties emerged while you were controlling the robot?
- What is the difference between sequencing written instructions and sequencing coding instructions?
- What are the similarities and differences between your code collections and those of other students?
- What new understandings have you about operating a piece of digital equipment?
- Have you achieved your learning objectives?

Were To Now?

For this student to keep growing, they need to focus on:

- altering a land map to broaden the types of instructions,
- attaching digital devices to robots, like a camera to broaden the types of code learnt.
- using other related and relevant application.

Links to the Digital Technology Curriculum

Coding

The student is able to:

- convert instructions written as a code request for going to a place
- practice the types of robot movements, such as moving forward, moving backward, turning right.
- correctly sequence the instructions.
- correct errors so robots move correctly.

Digital devices and creations

The student is able to:

- prepare and input code onto a digital device, such as an iPad, or tablet.

Digital applications

The student is able to:

- use useful code-writing applications to display their lesson.
- choose the appropriate level of a application relating to the activity being undertaken.

Draft

Links to the Curriculum

Characteristics of Technology

1. Carefully consider values and beliefs used, to understand the characteristics of the result produced. Carefully consider:
    - technological principles;
    - relevance to people;.

Technological Practice

Level 3

2. Sequencing a meaningful map design
3. Testing and evaluating the design. Selecting one method to produce an absolutely correct result.

Level 4

4. Use maps, testing to see:
    - the development;
    - the adequacy of the work.
5. Bring together practical and intellectual skills, as well as creative skills.
6. Understand the operation of technological systems

Links to the Curriculum

A Writing Bird - Instructive Writing

The basis of instructional writing is to show the reader how to do a task. The main thing is that someone else can follow the instructions.

Level 3 and 4

Take off/ Fly

- Instruction for going to a place

Resources

- A Writing Bird - Instructive Writing

Types of application code

- Blockly
- Path
- Wonder

EXEMPLAR 3

The Direction of Your Digital Compass

Strand: People and Computers
Level: 5

Concepts in Māori Language Digital Technology Developments

The Digital Technology student embodies and promotes Māori values, knowledge and education. The student is confident and competent in their understanding of the breadth of subject vocabulary and phrases related to Digital Technology..

The Learning Context

Students identify and respond to statements so they understand their own Digital Compasses.

The teacher's role is to plant in the students the protocols and responsibilities of digital citizenship. Teaching activities begin with discussion and communicating ideas for the statements. Each student is to think of the five types of response, and select one response for each statement. Finally, the statements are grouped into these three digital citizenship concepts:

- respecting and protecting yourself;
- respecting and protecting others;
- respecting and protecting intellectual property.

Then the major topics/issues are discussed such as these statements that emerge in the classroom, the school and the broader learning cluster.

Discussion

- What are the concepts and the key topics/issues of each statement?
- Talk on one of the topics/issues that have affected you? What happened? What problems emerged?
- What strategy was followed to resolve the problem?
- Who helped you?
- What is the difference between a connection issue and a face-to-face problem?
- How are connection resources like iPAD applications used correctly?

Where to Now?

For this student to continue to grow, they need to focus on:

- the values of the school/kura and their relevance to the three digital citizenship concepts
  - respecting and protecting yourself;
  - respecting and protecting others;
  - respecting and protecting intellectual property.

Group the classroom into the values of the kura/school. Each group arrives at some agreements that confirm that value.

- a contract, a Digital citizenship agreement for the whole kura/school, including students, families, teachers, and boards too.

Links to Digital Technology

By the end of Year 10: Level 5 of TMoA

The student is a participating digital citizen. They understand the importance of the learning paths guiding their pursuit of digital technology careers, and careers with digital technology in their world, nationally and globally as well. They evaluate technology design issues and the responses already identified and adjust them to improve performance.

Links to the Curriculum

Characteristics of Technology

1. They promote their own beliefs or values to produce outcomes:
2. For the whānau, the community, the hapū, or the iwi, and explore the impacts on other cultures and client groups.

Technological Practices

3. A strategy is sought to promote the results that have emerged.

Draft

Resources

- www.digizen.org
- Netsafe. (Sept 2016) Resources for secondary schools (Years 9–13)
- Park, Yuhyun. (Sept 2016) 8 digital life skills all children need – and a plan for teaching them World Economic Forum.
- Project DQ What is DQ? 8 digital skills we must teach our children

In Addition:

- ***Statements***

Forwarding disparaging texts about someone else.
Using mobile phones in the classroom.
Speaking with someone else in the digital world about something private.
Downloading a model essay from the kura/school's website.
Informing your friends of a website relevant to homework.
Visiting websites in emails you receive from strangers.
Sending your photos to a stranger.
Sending photographs of your friends to Facebook without asking their permission.
Agreeing to all friend requests in Facebook no matter whom.
Swearing, and writing lies on your friend's Facebook page.
Sending hyperlink relevant to Mathematics to your friends.

- ***Responses***

Good
Not good
From the context
Up to You/ Your Turn
What is the problem?

10. Appendix

Hangarau Matihiko: He Whak

Year Levels	1	2	3	4	5	6	7
Curriculum Levels	1		2		3		

Ngā Ariā o Ngā Whakatupuranga Hangarau Matihiko Arareo Māori

Ka whakaatu te ākonga Hangarau Matihiko me pēhea te whakatinana i ngā uara, ngā mōhiotanga me ngā mātauranga Māori. Ka whakamahia hoki ētahi kupu hāngai, rerenga hāngai hoki o te reo matatini o te Hangarau Matihiko.

Ka whakamahi te ākonga Hangarau Mat
ngā mōhiotanga me ngā mātauranga Mā
kua māia hoki tana whakamahi i te whā
kupu marau e hāngai ana me ngā rereng
te reo matatini o te Hangarau M

Te Tangata me te Rorohiko

Ka tautuhitia e te ākonga tana noho hei kiriraraau matihiko, ā, ka whakamārama hoki i ngā āhuatanga e hāngai ana. Kua tīmata tana whanake i tōna mōhio ki ngā mahi ka tutuki i te tangata i te hapori, ā, kua whanake hoki tana āhei ki te ako i ngā pūkenga whakawhitiwhiti hangarau matihiko me te tāpae hoki ki tōna ao. Ka tautuhi, ka taunaki hoki ia i ngā take hoahoa hangarau me ngā urupare ki aua take.

Ka tautuhitia e te ākonga tana noho h
matihiko, ā, ka whakawhiti kōrero, ka w
hoki i ngā āhuatanga e hāngai ana. Kua
hononga i waenganui i te ako me te m
whanake ōna pūkenga whakawhitiwh
matihiko ki te tāpae ki tōna ao, ki te m
whānui tonu. Ka tūhura ia i ngā take me
te hoahoa hangarau kua tautohut

Draft

katupuranga Kaupapa Māori Ake

	8	9	10	11 - 13
4		5		6 - 8

tihiko i ngā uara, āori. Kua tīmata, nuitanga o ngā ga hāngai hoki o latihiko.

Ka whakatinana, ka whakatairanga hoki te ākonga Hangarau Matihiko i ngā uara, ngā mōhiotanga me ngā mātauranga Māori. He māia, he matatau hoki tōna mārama ki te whānuitanga o ngā kupu marau e hāngai ana me ngā rerenga hāngai hoki o te reo matatini o te Hangarau Matihiko.

Ka tāmau te ākonga Hangarau Matihiko i ngā uara, ngā mōhiotanga me ngā mātauranga Māori. He māia, he matatau, he kaiaka hoki tana whakamahi i te whānuitanga o te reo marau me te reo horopaki hoki o te reo matatini o te Hangarau Matihiko.

Ka tāmau, ā, ka mātua whakamahi tika i ngā uara, ngā mōhiotanga ngā mātauranga Māori i ngā mahi katoa e hāngai ana. He māia, he mōhio, he matatau, he kaiaka hoki tana whakamahi i te rangiwhāwhātanga o te reo marau me te reo horopaki hoki o te reo matatini o te Hangarau Matihiko.

Ka tāmau, ā, ka whakamahi tika hoki te ākonga Hangarau Matihiko i ngā uara, ngā mōhiotanga ngā mātauranga Māori i ngā mahi katoa e hāngai ana. He māia, he mōhio, he matatau, he kaiaka hoki tana whakamahi i te whānuitanga o te reo marau me te reo horopaki hoki o te reo matatini o te Hangarau Matihiko.

---

hei kiriirarau whakamārama mōhio ia ki te ahi, ā, kei te iti hangarau otu, ki te ao ngā urupare o ia kētia.

Ka tautuhitia e te ākonga tana noho hei kiriirarau matihiko, ā, ka whakawhiti kōrero, ka whakamārama hoki i ngā āhuatanga e hāngai ana. Kua mōhio ia ki te hononga i waenganui i te ako me te mahi, ā, kei te whanake ōna pūkenga whakawhitiwhiti hangarau matihiko ki te tāpae ki tōna ao, ki te motu, ki te ao whānui tonu. Ka tūhura ia i ngā take me ngā urupare o te hoahoa hangarau kua tautohutia kētia.

He kiriirarau matihiko whai wāhi, māia hoki te ākonga. Ka whakahāngai ia i tōna māramatanga ki te hira o ngā huarahi ako e ārahi ana i tana whai umanga hangarau matihiko, umanga me te hangarau matihiko hoki i tōna ao, i te motu, i te ao whānui tonu. Ka whakaahua, ka whakamārama hoki ia i ngā āhuatanga ka pā ki ngā whakatau whakahoahoa me ngā momo hangarau ka whakamahia ki te whakapai ake i te whakamahinga. Ka whakaahua, ka whakamārama hoki i ngā mātāpono waiwai o te whakahaere tūmahi.

He kiriirarau matihiko whai wāhi, māia hoki te ākonga. Ka whakahāngai ia i tōna māramatanga ki te hira o ngā huarahi ako e ārahi ana i tana whai umanga hangarau matihiko, umanga me te hangarau matihiko hoki i tōna ao, i te motu, i te ao whānui tonu. Ka whakaahua, ka whakamārama hoki ia i ngā āhuatanga ka pā ki ngā whakatau whakahoahoa me ngā momo hangarau ka whakamahia ki te whakapai ake i te whakamahinga. Ka whakaahua, ka whakamārama hoki i ngā mātāpono waiwai o te whakahaere tūmahi.

He kiriirarau matihiko māia, mōhio tāpae hoki te ākonga. Ka whakaū ia i ngā kōwhiringa umanga hangarau matihiko, umanga me te hangarau matihiko huhua hoki o tōna ao, o te motu, o te ao whānui tonu, ā, ka hāngai ana whakatau umanga mōna. Ka rangahau, ka arohaehae hoki ia i ngā āhuatanga ka pā ki ngā whakatau whakahoahoa me ngā momo hangarau ka whakamahia. Ka arohaehae, ka whakahāngai hoki ia i ngā kitenga ki te whakapai ake i te whakamahinga. Ka rangahau, ka arohaehae, ka whakamahi hoki i ngā mātāpono matatini o te whakahaere tūmahi.

Draft

He Whakatupuran

Year Levels	1	2	3	4	5	6	7
Curriculum Levels	1		2		3		4

Te Whakaaro Rorohiko o ngā Whakatupuranga Ako Hangarau Matihiko

Poutohu 1
Ka wetewetea tētahi tūmahi rorohiko-kore ki ētahi tohutohu tika, tohutohu mārama, me kī kia ngāwari ngā tohutohu, (whakaaro hātepe). Ka taea te tuku tohutohu, ka tautohu mēnā kei te hē, ā, ka whakatika ai (te patuiro). Mā tēnei mahi e whakaatu ka taea e rātou te whakamahi i ō rātou pūkenga whakaraupapa hei wetewete i tētahi tūmahi ki ōna tohutohu iti nei.

Poutohu 2
Ka mārama ko tēnei mea te hātepe, he tukanga tohutoh
hopanga, ka taea hoki te whakamahi i ēnei ki te tuhi pa
ā, me tika, me hāngai ngā tohutohu kia taea ai e te roro
hoatu, ka whai hoki i ngā hātepe patuiro ngāwari i ro
rorohiko, rorohiko-kore hoki. Ka taea ēnei hātepe te w
hanga papatono māmā mā te whakauru i ngā mea pēne
i te whakaputanga me ngā raupapanga i tēnei taiao ha

Poutohu 5
Ka noho takitahi ki te whakaoti hopanga ki tētahi hatepe I āta hangaia nei kia aroā e tetahi purere rorohiko. Ka whakauru i te hatepe ma te hanga i tētahi papatono e whakamahi ana i ngā kōkuhunga i ngā whakaputanga, i ngā raupapanga, i ngā hohoki, ngā rerekētanga o ngā momo raraunga katoa, te whakamahi i ngā paheko whakatairite me ngā paheko taketake. Ka mōhio hoki ki hea whakamahia ai ngā momo anga whakahaere. Ka whakamārama/ tuhi i te papatono, me te whakamahi hoki i tētahi ara tika mō te whakamātautau me te pautiro. Ka mārama hoki, ka taea e te rorohiko te pupuri i ngā momo raraunga katoa mā te whakamahi i ngā mati tāhūrua.

Poutohu 6
Ka taea te tohu me te whakatairite i te āhua o te
rorohiko, o ngā hātepe tukurua mō te raru kotah
wehewehe) e pā ana ki te tatau o ngā whakatairite
te wā o taua mahi. Ka mārama ki te tū āhua o
tuhiwaehere (pērā i te whakakōpētanga, i te whak
hēanga), ngā whakamahinga noa o te pārongo tuh
whakamahinga o ngā momo hangarau i ngā pāron
Ka taea te whakamahi i te anga tārai rite ki tētah
tere ai, kia pai ai te pupuri i ngā kohinga ra

Te Hoahoa me te Hanga Otinga Matihiko

Poutohu 1
Ka whai wāhi ki tētahi mahi whakahiato he mea ārahi nā te kaiako, ki te waihanga, ki te raweke, ki te pupuri, ki te tiki ki te tuari hoki
Kei roto mai:

- Te tautohu pūrere matihiko me tōna pūtake i runga i te mōhio nā te tangata i hanga.
- Tautohu i ngā kōkuhunga me ngā whakaputanga o tētahi pūnaha
- Ka aro ki ētahi pūmanawa me te pūtake o aua pūmanawa (kanohi-kitea, taiwhanga waituhi)
- Ka mārama ko tā te rorohiko he pupuri kōrero, ā, taihoa ake tiki atu ai.

Poutohu 2
Mēnā ka hoatu tohutohu/paearu me ngā taputapu/āhuatanga rānei ka whakatau tikanga (ā-takitahi te nuinga) mō te waihanga, te raweke, te pupuri, te tiki, te tuari, me te whakamātau rānei i te korero (i whakahiatohia mō tētahi take motuhake) i roto i tētahi pūnaha tūturu.
Kei roto mai

- Ka mārama he mea tipu, he mea panoni hoki te pūrere i roto i te huringa o te wā, ā, he awenga/pānga anō tōna ki te tangata/porihanga.
- Ka mārama ki te mahi ake o tēnā, o tēnā wāhanga o te kōkuhunga tūturu, te tukanga, te pūnaha whakaputanga me te āhua mahi ngātahi ō aua wāhanga.
- Ka mārama he mea whakaumu ngā kōkuhunga hei whakaputanga i roto i tētahi pūnaha tūturu me te kawenga 'whakamatua' a te tangata.
- Ka āta whakamahi i te whanuitanga o ngā pūmanawa (momo kōnae)

Draft

nga Kaupapa Rua

8	9	10	11 - 13
4	5		6 - 8

hu ki te whakaoti
patono rorohiko,
ohiko te whai. Ka
oto i ngā taiao
whakamahi ki te
ei i te kōkuhunga,
anga papatono.

Poutohu 3
Ka mārama ki tēnei mea te hātepe, ki te rerekētanga i waenga i te hātepe me te papatono, ā, ka neke atu i te kotahi te hātepe ka taea mō te hopanga kotahi. Ka taea te whakaraupapa hopanga ki ngā tohutohu ngāwari ki te hanga hātepe mō te papatono rorohiko, ka whakamahi i ngā whakaaro raupapa ki te matapaki i te whanonga o ēnei papatono. Ka taea te whakahiato , te patuiro hoki i ngā papatono e whakamahi ana i ngā kōkuhunga, i ngā whakaputanga me ngā raupapanga me ngā hohoki. Kua mārama hoki e rua ngā āhuatanga mō te pupuri raraunga, ko ngā mati tāhūrua ēnei, ā, ngā bits.

Poutohu 4
Kua noho ki te whakaraupapa hopanga ki te hanga hātepe mā te whakamahi i ngā papa waihanga e toru i tēnei mea o te papatono: raupapanga (te raupapa tohutohu), kōwhiringa (te kōwhiri ko tēhea wāhanga o te hātepe e whakahaeretia ai ki ngā uara i tohua), me te tukurua (he tukurua i tētahi wāhanga o te hātepe me te loop e whai ana). Ka taea te whakauru i te hātepe mā te hanga i tētahi papatono e whakamahi ana i ngā kōkuhunga i ngā whakaputanga, i ngā raupapanga, i ngā hohoki me ngā tohutohu taketake mā te whakamahi i ngā paheko whakatairite.

Ka taea ngā hātepe me ngā papatono ngāwari te patuiro mā te tautohu mēnā kua hē ngā tohutohu, te whakatika i aua hē, me te whakamārama mai he aha i pēnei ai, i pēhea hoki te whakatika. Ka mārama hoki ki te whakaatu mai o te rorohiko i ngā raraunga mā te whakamahi i ngā mati tāhūrua, ā, ka taea e te rorohiko te rapu i ngā raru kua ū ki te pātengi raraunga me ōna whakawhitiwhitinga. Ka noho hukihuki mai i te 4 Haratua 2017. ā tōna wā ka whakahoutia i muri i ngā whakamātauranga me ngā tātaritanga. Ka arotakea ngā momo hātepe e pā ana ki te tere me te pai o te rorohiko ki te rapu me te wehewehe i tēnei mea o te raraunga.

e uauatanga ā-
i (te rapu me te
enga me te roa o
o te pārongo
amunatanga, i te
iwaehere, me te
go tuhiwaehere.
i papatono, kia
araunga.

Poutohu 7
Ka matua mohio kare tonu e taea te whakatika i nga raru ā-rorohiko katoa mā te hātepe, ā, he uaua hoki ētahi (kāore he pūrere kia hangaia ki te whakamahi i tēnei tū momo hātepe), ā, kia tīkina atu he momo otinga, arā, ko te otinga *Heuristic* tēnei. Ka whakawhitiwhiti kōrero hoki mō te tohutohu anga raraunga me te arotake i te whakamahinga o aua raraunga i roto i te āhuatanga o te tuaritanga i waenga i whakaritenga mahi, i ngā whakaritenga pupuri hoki, me ngā pānga ki ngā momo hātepe katoa. Ka whakamahia hoki te tukanga tukurua ki te hoahoa, ki te whakahiato, ki te tuhi me te whakamātautau i tētahi papatono rorohiko matatini.

Poutohu 8
Ka tātari hoki i ētahi wāhanga o te pūtaiao rorohiko (pērā i ngā reo ōkawa, i ngā kawa whatunga tuku kōrero, i te matatini me te ngohengohe, he whakataruna hinengaro, ngā whakairo me ngā rorohiko ataata, raraunga nui) e pā ana ki te wāhanga e whakapakarihia ana e ngā whakaaro matua o ngā hātepe, ngā whakaaturanga raraunga me ngā mahi hanga papatono. Ka arotakea te kōtuitanga o ēnei whakaaro matua i te wā e hoahoatia ana ngā taupanga. Kua whakamahi i tētahi anga pūmanawa hangana kua whakaaetia, ki te hoahoa, ki te whakahiato, ki te tuhi me te whakamātautau i tētahi papatono rorohiko whatutoto.

Poutohu 3
Mēnā ka hoatu tohutohu ka whakatau tikanga (ā-takitahi te nuinga) mō te taputapu/āhuatanga pai hei whakaoti rapanga. Ka mahi haere mā tētahi tukanga auau ki te hoahoa, ki te whakahiato, ki te waihanga, ki te pupuri, ki te whakamātau, ki te arotake kōrero matihiko e tutuki ai tōna pūtake.
Kei roto mai

- Ka tīpako pūmanawa e pai ana me ngā momo kōnae mō tētahi kaupapa ake e ai ki te tino āhuatanga, ā, ka taunaki mai i tāna i tīpako ai. Ka whakamahi i ngā pūmanawa i tīpakohia ki te whakahiato, ki te whakakotahi kōrero matihiko hei waihanga i tētahi huanga.
- Ka mārama ki tā te pūnaha whakahaere i te pūrere rorohiko whaiaro, te whakamarumaru me te pūmanawa tautono. Ka whakamārama i ngā tikanga o te whakahaere kōnae me te whakamahi pūrere pupuri kōrero.

Poutohu 4
Ka taea te mahi takitahi i runga tukanga auau ki te hoahoa, ki te whakahiato, ki te pupuri, ki te whakamātau ki te arotake hoki kōrero matihiko e tutuki ai tōna pūtake.

Kia maumahara: I te kauneke i waenga i te poutohu 4 me te 5 ka nui atu te hangore, te mauritau, te arotautanga o ngā taputapu me ngā āhuatanga me te whakahāngai i ngā horopaki whāiti.

Poutohu 5
Ka taea te hono haere tōna mōhiotanga ki ngā pūmanawa matihiko me ngā pūnaha ki te whakamahere, ki te hoahoa, ki te whakahiato/whakamātau kit e waihanga huanga matihiko kounga, e hāngai tonu ana ki ngā tohutohu a te kaihoahoa.
Kei roto mai

- Ka mārama ki ngā wāhanga pūrere, ngā tikanga me te hanganga ā-whatunga e whakamahia ana i roto i te Hononga Whānui (WAN) ki tōna whakamahi ki te whakakao, ki te whakarite kit e whakahaere anō hoki i te Hononga Whānui.
- Ka matapaki, ka hoahoa, ka hanga, ā ka patuiro hoki i te taiao hiko matatini me ngā pūnaha tāmau e ai ki ōna pūnaha iti me ōna hanganga papatono.
- Ka mārama ki tā te pūnaha hōtuku painga ki tētahi whakahaere. Ka whakamārama i te āhua o te tauwhitiwhitinga o ngā wāhanga matua o te pūnaha hōtuku (te pūrere, te pūmanawa, ngā hātepe raraunga me ngā tāngata) me te hiranga o te kaiwhakamahi mutunga me te whakahaere haumaru.
- Ka whakahāngai tōtika i te tukanga pūnaha pūkahatanga auau ki te whakahiato huanga matihiko.

Draft

TE TĀHUHU O TE MĀTAURANGA
MINISTRY OF EDUCATION

www.education.govt.nz

Hei tautoko tēnei rauemi i
Te Marautanga o Aotearoa

Te Kāwanatanga o Aotearoa