

Support for planning to strengthen numeracy across learning areas

CHANGES TO NCEA

NCEA is changing so that it continues to be a valued and relevant qualification that reflects the needs of educators, students, whānau and employers. We're strengthening NCEA by making the following seven key changes.

The seven key changes

Make NCEA more accessible	+
Mana ōrite mō te mātauranga Māori	
Have fewer, larger standards	
Strengthen literacy and numeracy requirements	✓
Simplify NCEA's structure	
Show clearer pathways to further education and employment	+
Keep NCEA Level 1 as an optional level	

KEY



Indicates where a change is a focus of these activities



Indicates where a change is explored within one of these activities

A note to curriculum leaders using this resource

1. There are three activities outlined in this slide deck.
2. The activities can be used as part of your teacher-only day and as an ongoing resource to help your department.
3. Although the activities build on one another, **select only the ones** that are relevant to the needs and interests of your department.
4. Each activity has been tagged with a time allowance to assist planning. These are very approximate and can be adjusted to your context and time frame.
5. The draft Common Practice Model is being released in Term 4, 2023. It will outline evidence-informed pedagogical approaches and practices to underpin teaching and learning of literacy & communication and maths across the curriculum. You can find more information about the Common Practice Model here: [Common Practice Model](#)



This resource will help you to:


1. Identify effective numeracy practices to support numeracy teaching and learning.
2. Use the [Numeracy Enhanced Plans](#) and [Numeracy Pedagogy Guides](#) to identify numeracy opportunities when planning across learning areas.
3. Explicitly plan for numeracy opportunities in a plan of work, supported by numeracy planning prompts and the Common Practice Model, for learning areas.





Activity 1: Identifying effective numeracy practices

1. Open the document: [Effective Practices that Support Numeracy](#)
2. Take 10 minutes to familiarise yourself with the 7 practices.
3. Discuss the following questions:
 1. What effective strategies are already a strength for our department?
 2. How do we know?
 3. What strategies could we strengthen?
 4. How?



MINISTRY OF EDUCATION
TE TĀHURU O TE MĀTAURANGA

Effective Practices that Support Numeracy

As you read through these practices, consider:

- » What effective practices are already a strength for you? How do you know?
- » What practice do you want to further develop or strengthen? Who or what could help?
- » What can you do now to reflect on and further develop your numeracy teaching practice?

1. Integrate numeracy into rich, open learning experiences

- » Model approaches to unpack complex problems, such as 'thinking out loud' to identify key information in the problem.
- » Support ākonga to seek out further information and make sense of the problem in a context they can relate to.
- » Challenge ākonga to consider multiple numeracy strategies and explain how each strategy works.

2. Promote a growth mindset and have a positive disposition to numeracy

- » Challenge the myth that there are "maths people" and "non-maths people". Everyone can be numerate.
- » Acknowledge the value of incorrect responses by finding the brilliance in the thinking, and use this to begin conversations that move the learning forward.
- » Have high expectations for all ākonga.

5. Empower ākonga to work creatively and collaboratively

- » Encourage ākonga to share and develop ideas using [Talk Moves](#).
- » Use mixed-ability groups so ākonga can build on each other's numeracy skills and learning area knowledge.
- » Support ākonga to take intellectual risks, like providing partial understandings that can progress the collective thinking.

6. Be curious about your ākonga

- » Have a [repertoire of questions](#) that you can use to uncover the thoughts of your ākonga.
- » Encourage ākonga to be curious and ask questions too.
- » Encourage ākonga to share their experiences, and design activities that build on their experiences and integrates numeracy into your learning area.

Introducing the Numeracy Pedagogy Guides

There is a [Numeracy Pedagogy Guide](#) (NPG) for most learning areas.

The Numeracy Pedagogy Guides (NPGs) showcase:

- a selection of numeracy-rich contexts in your learning area
- the small, effective steps that you can trial and weave into your teaching practice

Music Numeracy Pedagogy Guide

Operations with numbers	What can this look like in Music?	What can I do as a kaiako of Music?
Work with whole numbers up to billions, fractions, decimals to 3 places, percentages, and integers	<p>Work with fractions such as halves, thirds, quarters, eighths, and sixteenths.</p> <p>Ākonga use a range of differentiated body percussion to create beats divided into halves, quarters, eights, and sixteenths.</p> <p>Ākonga create a polyrhythm, with one group stamping a beat, one group clapping out beats in thirds, and another group slapping thighs in fourths.</p> <p>Ākonga use their knowledge of halves to work out how long to hold a dotted rest or beat.</p> <p>Ākonga use fractions such as halves ($\frac{1}{2}$), thirds ($\frac{1}{3}$), quarters ($\frac{1}{4}$), eighths ($\frac{1}{8}$) and sixteenths ($\frac{1}{16}$) to adjust note values based on time signatures.</p> <p>Ākonga choose a song and invent their own number and note length system in order to recreate it with others.</p>	<p>Explain how many cultures (including some Pacific Island nations) have used numbers and gestures to notate pitch, melodic movement, and harmony.</p> <p>Provide opportunities for ākonga to experience a range of different beats and rhythms. Make connections between beats and fractions such as a half ($\frac{1}{2}$), third ($\frac{1}{3}$) and quarter ($\frac{1}{4}$) and beats by explaining that both involve dividing something into equal parts.</p> <p>Provide examples of beats and rhythms combinations, for example:</p> <ul style="list-style-type: none">» videos of performances such as sāsā and kapa haka (available on the ASB Polyfest website and Māori Television)» body percussion videos (available on YouTube). <p>Provide opportunities for ākonga to explore aural and visual combinations of beat divisions using tools such as:</p> <ul style="list-style-type: none">» Groove Pizza, a tool for creating music using shapes, angles, and patterns» Make Beats (Ableton Learn music), a tool for creating grid-based step sequences that assign beats to different parts of a drum kit» the piano roll feature of Chrome Music Lab or another Digital Audio Workstation (DAW), which provides an opportunity to combine pitch and rhythmic subdivision. <p>When creating and recreating music, experiment with simple and compound time signatures and note values, for example, the doubling of note values from 4/4 time to 2/2 or 5/8 to 5/4 time.</p>

For learning areas without a specific NPG, useful and applicable strategies to support numeracy development may be found by dipping into the NPGs provided for other subjects

Introducing the Numeracy Enhanced Plans

There are Numeracy Enhanced Plans (NEPs) for most learning areas.

The Numeracy Enhanced Plans (NEPs) look at a sequence of activities that are part of a teaching and learning programme.

They highlight the numeracy opportunities within the activities and provides ways in which you can make numeracy explicit for ākonga.



The image shows the cover of the 'English Numeracy Enhanced Plan' document. The top section is dark blue with the Te Poutāhū Curriculum Centre logo and the title 'English Numeracy Enhanced Plan' in white. Below this, a light blue banner reads '100% Pure New Zealand'. The main content area is white and divided into three columns. The first column, titled 'Context', describes the sequence of learning and its adaptability. The second column, titled 'Numeracy connections', lists 'Operations with Numbers' and provides two bullet points. The third column, titled 'Achievement objectives', lists 'Years 9-10 English Curriculum' and includes 'Understand' and 'Know' sections with their respective bullet points.

English Numeracy Enhanced Plan

100% Pure New Zealand

Context

This sequence of learning explores how visual and verbal techniques can be used humorously in satire when there is a shared understanding of how an idea is communicated. The activities cater to ākonga in Year 10 but can be adapted for ākonga in Year 11.

Numeracy connections

Operations with Numbers

- » Identify where percentages are used to persuade an audience of a specific perspective.
- » Interrogate claims in written texts that are made using mathematical arguments by engaging in mathematical calculations.

Achievement objectives

Years 9-10 English Curriculum

Understand

- » Language and literature give us insights into ourselves and others.
- » Communication depends on shared codes and conventions.

Know

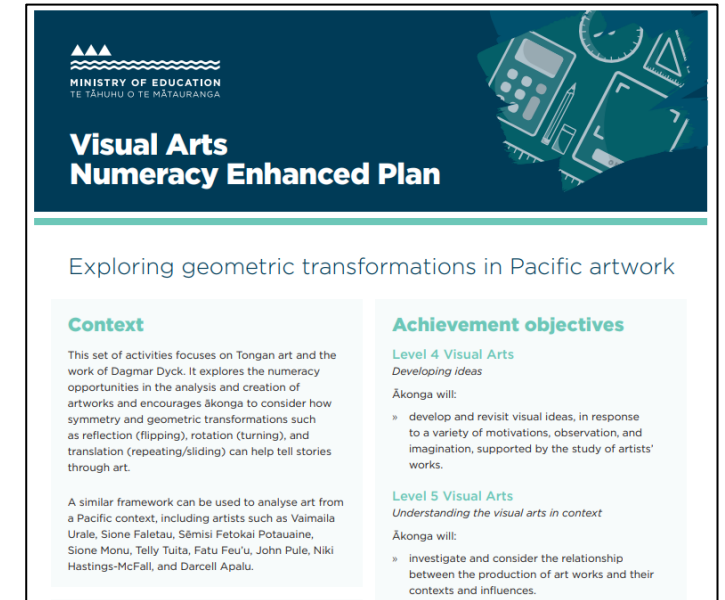
- » Ngā whāinga me ngā hunga mā rātou ngā tuhinga | Text purposes and audiences
 - All text creators have biases, which may undermine or enhance their intended purposes. These biases may not be immediately apparent to them or their audience.
- » Ngā āhuatanga reo | Features and structures of language



Activity 2: Using the NPGs and NEPs

1. Find and read the [Numeracy Pedagogy Guide and The Numeracy Enhanced Plans for your learning area](#), or, select from the list of NPGs currently available from other learning areas.
2. As a department, select an upcoming unit of work to explore.
3. Discuss the following questions
 1. What numeracy opportunities already exist in your planning?
 2. What numeracy opportunities could you integrate into your planning?

Use the [NEPs and NPGs](#) to support these discussions.



Visual Arts Numeracy Enhanced Plan

Exploring geometric transformations in Pacific artwork

Context

This set of activities focuses on Tongan art and the work of Dagmar Dyck. It explores the numeracy opportunities in the analysis and creation of artworks and encourages ākonga to consider how symmetry and geometric transformations such as reflection (flipping), rotation (turning), and translation (repeating/sliding) can help tell stories through art.

A similar framework can be used to analyse art from a Pacific context, including artists such as Vaimaila Urale, Sione Faletau, Sēmisi Fetokai Potauaiane, Sione Monu, Telly Tuita, Fatu Feu'u, John Pule, Niki Hastings-McFall, and Darcell Apala.

Achievement objectives

Level 4 Visual Arts
Developing ideas

Ākonga will:

- » develop and revisit visual ideas, in response to a variety of motivations, observation, and imagination, supported by the study of artists' works.

Level 5 Visual Arts
Understanding the visual arts in context

Ākonga will:

- » investigate and consider the relationship between the production of art works and their contexts and influences.

Visual Art Numeracy Pedagogy Guide		
Operations with numbers	What can this look like in Visual Arts?	What can I do as a kalako of Visual Arts?
Choose an appropriate approach to calculation (written, mental or digital)	Apply knowledge of ratios to develop a new colour, medium or other material. Ākonga need to know the correct ratios of materials to create a sculpture that is not too brittle and not too dense.	Encourage ākonga to consider how much of each type of material they are combining when developing a new colour, medium or other material. This is especially important if the ākonga needs significant amount of the new material or if they may need more new material later. An ākonga creates a light brown skin colour using 3 drops of yellow, 2 drops of blue and 2 drops of red. This is represented as a ratio of 3:2:2. If they use 4 drops of yellow, then to make the same colour, ākonga would need two and two-thirds of blue and two and two-thirds drops of red. Here is a mathematical example of using ratios when mixing paint.
Work with whole numbers up to billions, fractions, decimals to 3 places, percentages, and integers	Use fractions and the language of fractions to appropriately draw people, items, or objects. Reference the golden ratio (also known as the Rule of Thirds or the Fibonacci sequence) when analysing composition of artworks or designing artwork. Ākonga use unit fractions' such as half ($\frac{1}{2}$) and a quarter ($\frac{1}{4}$) and phrases such as "evenly distributed" to describe where the eyes, nose and mouth are located on a human face.	Discuss with ākonga how fractions are relative to the whole and are evenly split. This means that if an ākonga draws a smaller face shape, the eyes will still be halfway down the face, although this position will be different on a larger face shape. Use the Fibonacci sequence of 1, 1, 2, 3, 5, 8 and relate this to how the sequence is used to draw the golden spiral/rule of thirds . Discuss how the Fibonacci sequence is found in nature, and how this might help ākonga in their renderings of the natural world or compose a piece of artwork of their own.



Sample planning prompts for numeracy across all learning areas

Specific learning area planning prompts for numeracy

Numeracy Planning Prompts

The *Numeracy Planning Prompts* are an example of how each learning area can plan to use numeracy to enrich their teaching and learning programme.

For each subject area, this slide pack includes:

1. Sample numeracy opportunities
2. Links to numeracy content ideas in the Numeracy Learning Matrix

Use [Unpacking Numeracy](#) to identify the content ideas this *Numeracy Planning Prompts* refers to.

Activity 3: Integrating numeracy opportunities into your planning

1. Find your subject area planning prompt and explore some:
 1. Sample numeracy opportunities
 2. Possible links to numeracy content ideas
2. Use this time to identify and incorporate numeracy opportunities explicitly into your planning for your unit of work that you identified in Activity 2

While you complete this activity, consider the following questions:

1. Who can you approach for support if you have any numeracy related questions?
2. Is there any numeracy content that you need support from your maths department to teach?
3. Is your planned approach and language for this numeracy content consistent with other departments?



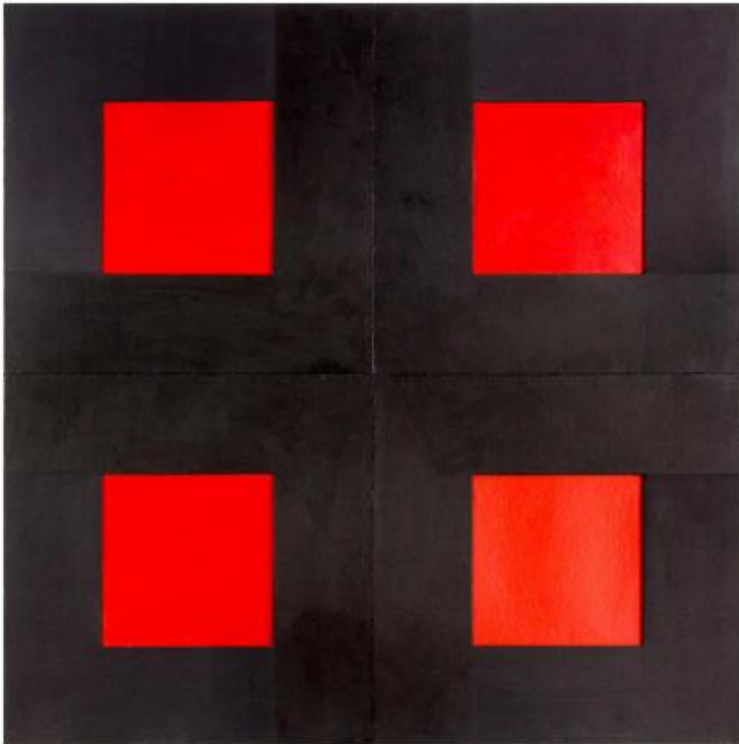
60 minutes

Numeracy Planning Prompts

Find your *Numeracy Planning Prompt* from the table below:

Learning Area	Slide
The Arts	13
English	18
Health and Physical Education	20
Learning Languages	24
Science	26
Social Sciences	30
Technology	36
Mathematics and Statistics	42

Sample numeracy opportunities in Visual Arts



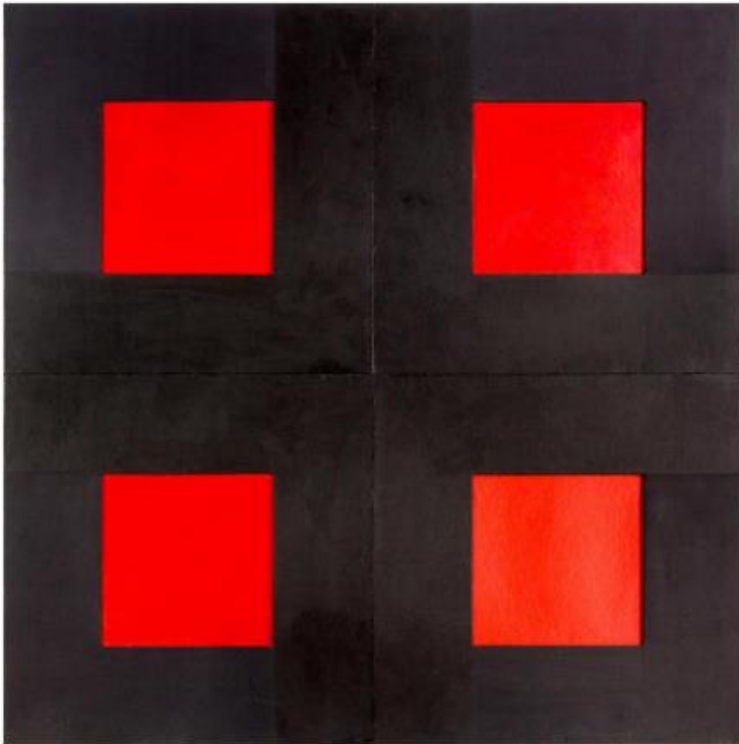
Red Square Four (Human Rights Series)
By Ralph Hotere

When planning, you could consider the following:

- How might ākonga describe the composition of Red Square Four using mathematical language?
- How do the interaction of shapes, size and colour give meaning?
- What tools were used to develop this piece of artwork?



Links to the content ideas for numeracy



Red Square Four (Human Rights Series)
By Ralph Hotere

Recognise symmetry

Ākonga identify how the use of line symmetry and rotational symmetry in Red Square Four impacts the composition of the piece.

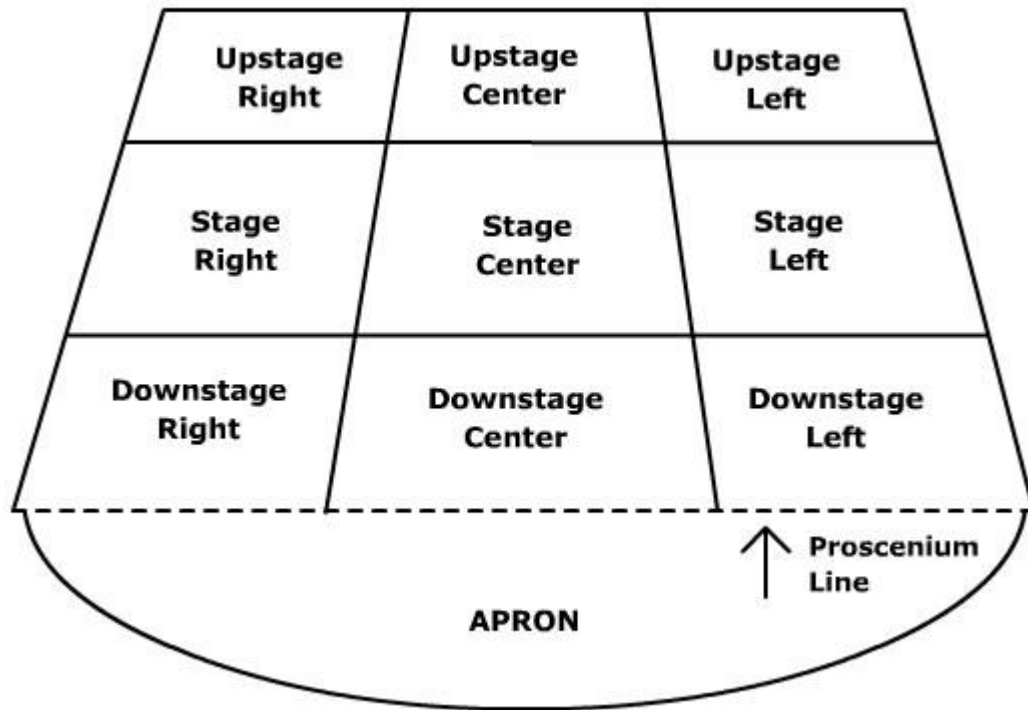
Transform objects to design for purpose

Ākonga describe geometric transformations are used to create Red Square Four, and how these transformations provide meaning to the artwork.

Use and interpret results of measurement

Ākonga consider the tools that are used in developing this artwork. This might include the materials used in the artwork, and how measurement was used to ensure the red squares were the same distant apart.

Sample numeracy opportunities in Dance and Drama



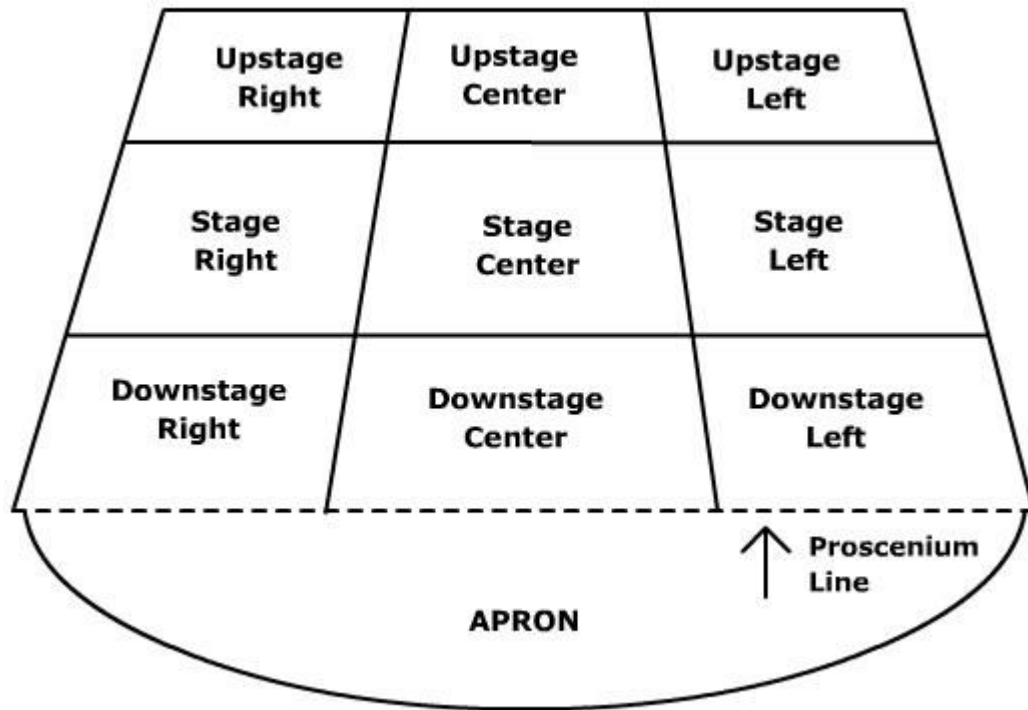
When planning consider the following:

- How might ākonga describe movement around the stage using mathematical language?
- How might you include terminology like coordinates, angles, linear (straight lines)?
- How might these relate to terminology used in Dance or Drama?
- What skills do ākonga already need to access the information on this diagram?

Source: [How to create spatial awareness for theatre sound effects based on the subject stage position — 2201 Recording](#)



Sample numeracy opportunities in Dance and Drama



Source: [How to creating spatial awareness for theatre sound effects based on the subject stage position — 2201 Recording](#)

Recognise symmetry

Ākonga identify how the use of line symmetry and rotational symmetry in the movement around the stage is applied.

Understand and use systems for location and navigation

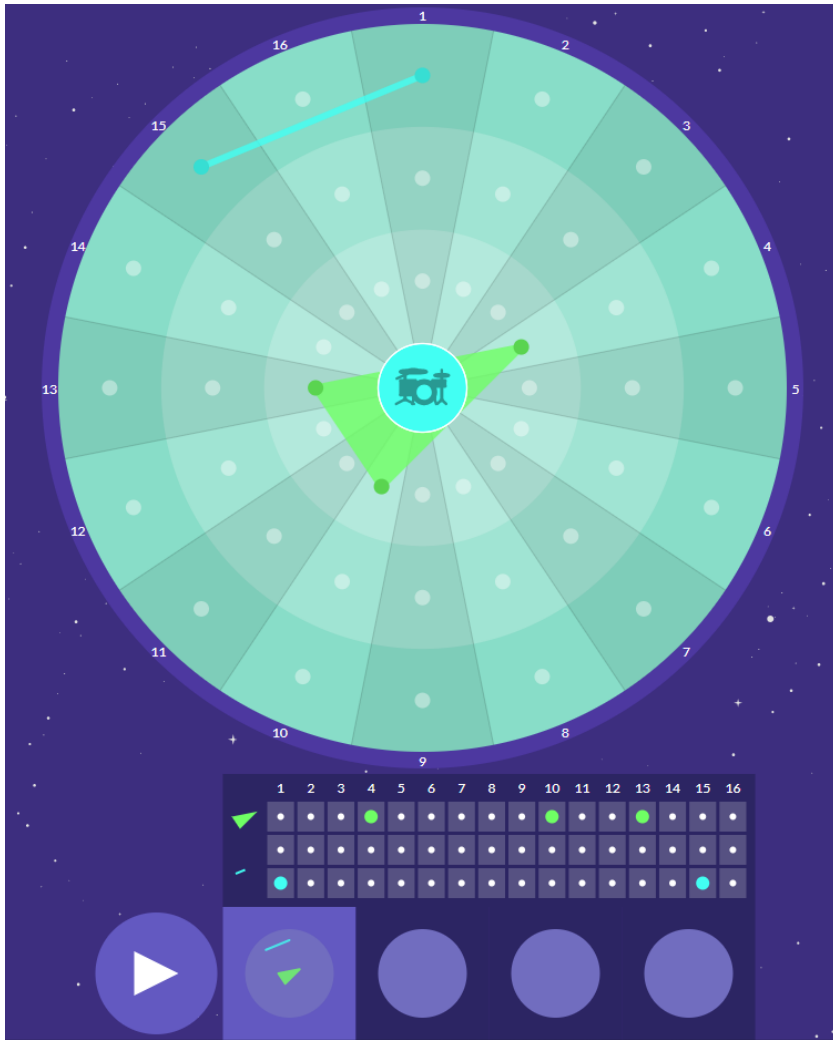
Ākonga describe movement (navigation) around the stage using stage direction and how these are similar to compass directions.

Understand and use the spatial properties and representations of objects.

Ākonga consider the angles, distances, and shapes created by movement on stage and how they relate to each other.



Sample numeracy opportunities in Music



When planning consider the following:

- How might ākonga describe the composition of a piece of music using mathematical language?
- Where might patterns or sequences be prevalent in music?
- What music tools could be used to develop understanding of music and numeracy? eg. [Groove Pizza \(musedlab.org\)](https://musedlab.org)
- What language that you use in music also exists in numeracy?

Source: [Groove Pizza \(musedlab.org\)](https://musedlab.org)

Sample numeracy opportunities in English

TT Isle of Man organisers investigating five deaths

[Morning Report on Radio New Zealand \(RNZ\)](#)



Listen to [this interview](https://tinyurl.com/isle-of-man) (https://tinyurl.com/isle-of-man) between Radio New Zealand reporter Susie Ferguson and TT Formula One motorcycle champion Graeme Crosby.

Consider the language features used in this interview:

- What point is Graeme Crosby making with the Everest comparison?
- Do you think the comparison is useful?
- What does it make you think about the relative dangers of the Isle of Man race?



Links to the content ideas for numeracy

TT Isle of Man organisers investigating five deaths

[Morning Report on Radio New Zealand \(RNZ\)](#)



Picture credit: [unsplash.com](#)

Calculate averages (including the mean)

Ākonga consider how the averages for the speed competitors are driving at are calculated and interpret what these speeds mean for drivers (56kmh^{-1} in 2007 compared to 220kmh^{-1} in 2022).

Work with whole numbers up to billions

Ākonga identify the mathematical thinking used to persuade listeners of the relative danger in the TT Isle of Man race. They explain how mathematical thinking is used to persuade the listener to a specific perspective.

This also supports Process Idea 3 where learners explain the reasonableness of mathematical and statistical responses to situations.

Sample numeracy opportunities in PE



When planning consider the following:

- How do you interpret the values on this watch?
- What could this watch be measuring?
- How is accuracy in a measure ensured?
- How do you ensure learners can access this thinking in PE?



Links to the content ideas for numeracy



Ākonga can:

Express the time taken to complete an activity to an appropriate degree of accuracy.
i.e. Depending on the activity, recording minutes and seconds may be sufficient.

Understand the definition of a lap time. Use lap time to **estimate** how long they would expect to complete a multiple (identical) laps.

Record the time off their stopwatch correctly.

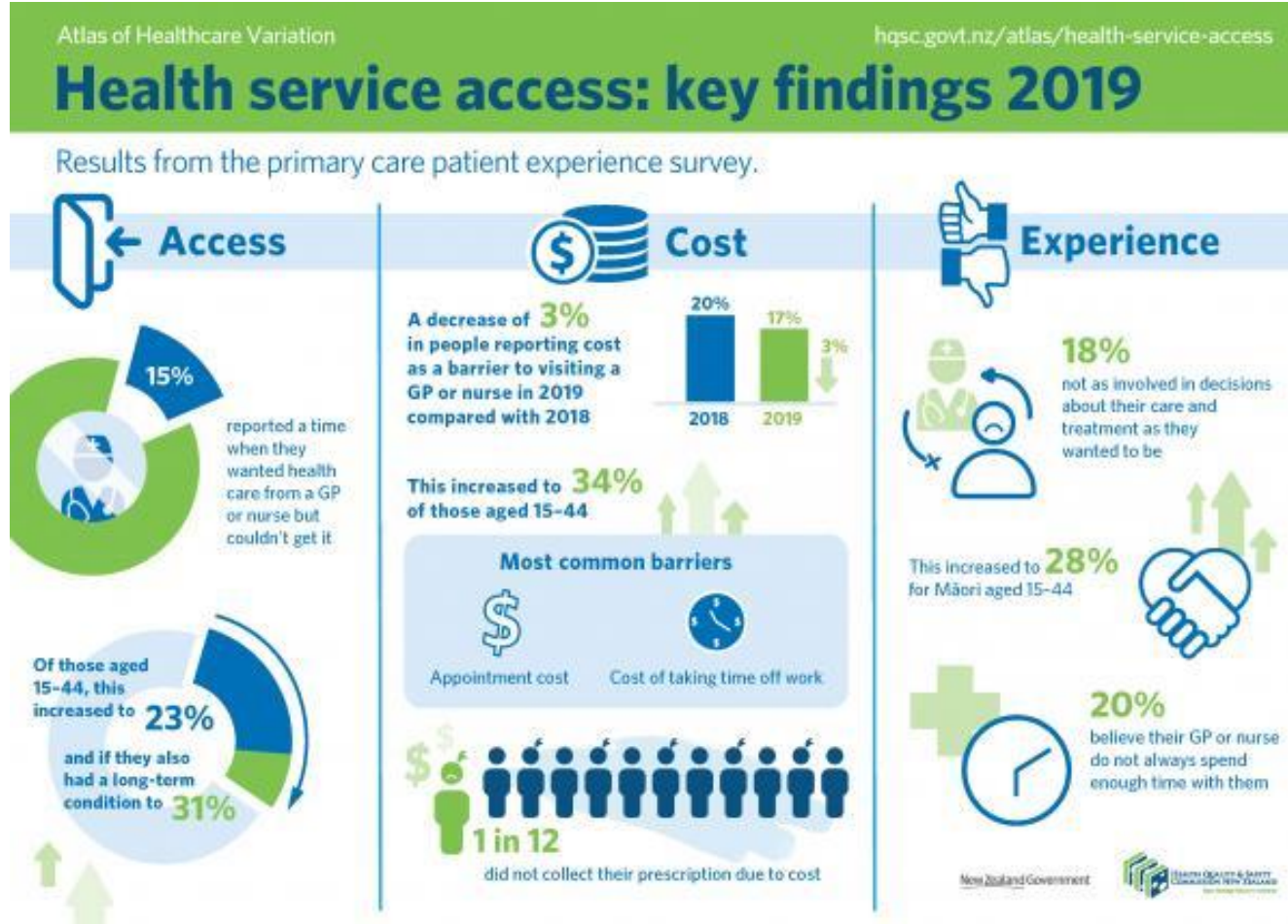
e.g. The timer here shows 1 minute, 27 seconds. 1.27 minutes implies that it took 1 minute and 27th of a minute. 27th of a minute is actually $0.27 \times 60 = 16.2$ seconds.

Identify the **units of measure** used by the stopwatch.

e.g. The 48 in this stopwatch here represents 48 hundredths of a second (or 48 centiseconds). A thousandth of a second would be a millisecond, which is not illustrated in this particular stopwatch.



Sample numeracy opportunities in Health

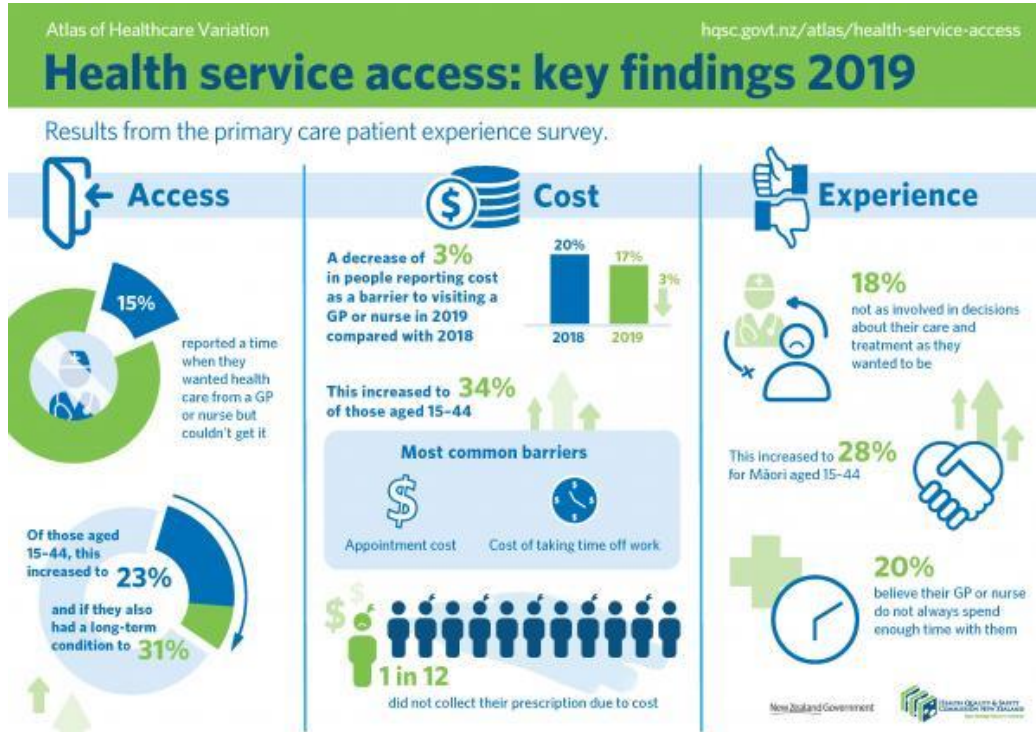


Consider the following:

- Is this data trustworthy? How do you know?
- What do you think was the purpose of the study?
- Are you surprised by any of this information?
- How do these statistics relate to intermediate school students?
- What might this information mean for teenagers and their relationships?

Credit: [Health service access](#) | [Health Quality & Safety Commission \(hqsc.govt.nz\)](#)

Links to the content ideas for numeracy



Credit: [Health service access | Health Quality & Safety Commission \(hqsc.govt.nz\)](https://www.hqsc.govt.nz/atlas/health-service-access)

Work with fractions and percentages

Ākonga can convert between a fraction and a percentage. Ākonga develop understanding that percentages can be written as fractions and vice versa. They can also question the purpose of expressing some facts as percentages what they mean as fractions, e.g. 15% means 3 out of 20.

The problems that learners solve will include commonly encountered rates, ratios, and powers.

Ākonga identify terms such as “1 in 12” as a ratio and illustrate what this means in context.

Recognise and use appropriate data displays to investigate questions or claims for summary, comparison, and simple time series situations

Ākonga question the bar graphics as a means of displaying data. Are the bars to scale? Are they used for illustrative, rather than statistical reasons?

Evaluate statements and representations made by others, based on data that is provided to them

Ākonga interrogate the validity of the data and seek to understand its implications.

Sample numeracy opportunities in Vagahau Niue

Niue Foufou



When engaging in Vagahau Niue, students will learn about Niue culture. When learning about Niue Foufou, consider the following:

- How might ākonga describe the Foufou using mathematical language?
- What patterns can you see in the flower arrangement?
- If students were to make a Foufou what measurements would they need?

Links to the content ideas for numeracy

Niue Foufou



Measure, with the appropriate level of accuracy, the circumference of the head the foufou is being made for. Use the target language to formulate measurement questions and answers.

Decide the flower pattern for their foufou, if they choose to use flowers. Use one iteration of the pattern to **estimate** how many flowers the foufou will need. Use target language to discuss colour, size and say what is required.

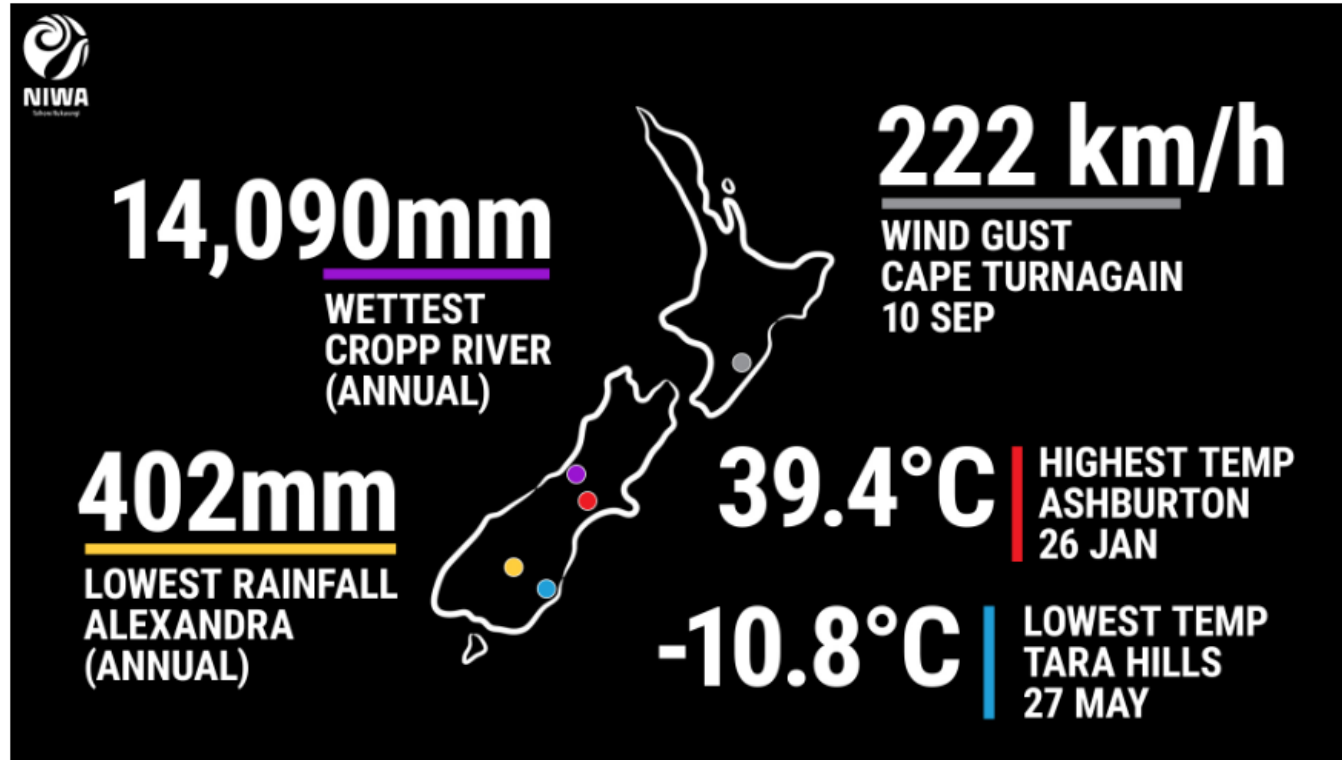
Estimate how long it will take to make a foufou. Compare this to the actual time needed to make the foufou or calculate how many foufou they could make in a given time period.

Discuss an appropriate price point at which to sell the foufou, given the time taken to make each one and the cost of materials. Use target language numbers, expressions of time and expressions of opinion in the process.

Use **mathematical language** in context e.g. circumference is the distance around the head – the word circumference rather than perimeter is used because the head is circular.

Sample numeracy opportunities in Physics, Earth and Space Science

2021: New Zealand's warmest year on record



Consider this using the infographic from NIWA:

- What does this tell you about weather in Aotearoa New Zealand?
- What is surprising about this data?
- How can this data be used?
- Is it trustworthy? How do you know?

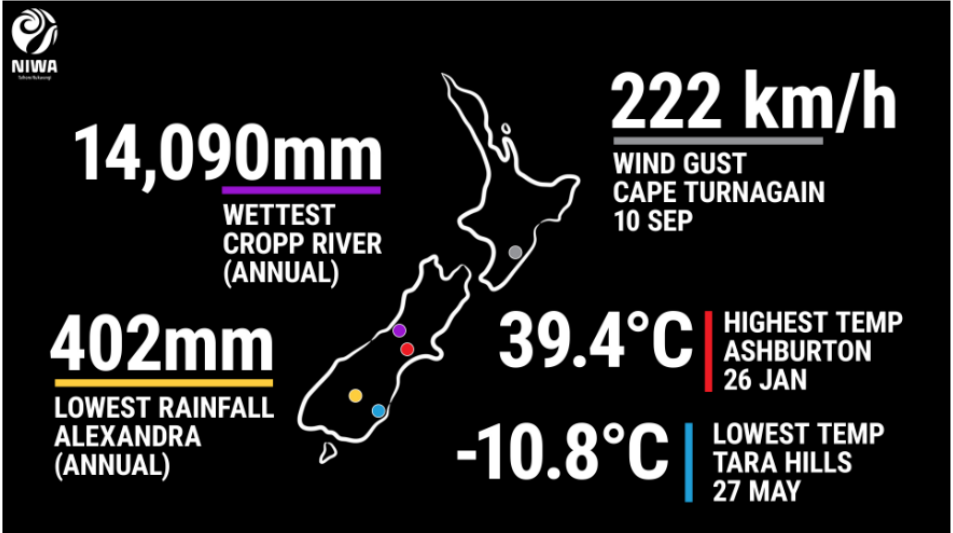
Temperature

Annual temperatures were above average (+0.51°C to +1.20°C above the annual average) for much Aotearoa New Zealand. Well above average temperatures (>1.20°C above the annual average) occurred in parts of Auckland, Bay of Plenty, Tasman and Fiordland. Near average (within -0.50°C to +0.50°C of average) temperatures occurred in western Waikato, coastal Wairarapa and parts of northern Canterbury and Otago. 2021 was the warmest year on record for New Zealand, based on NIWA's seven-station series which began in 1909.

Source: [NIWA](https://www.niwa.co.nz/)

Links to the content ideas for numeracy

2021: New Zealand's warmest year on record



Temperature	Annual temperatures were above average (+0.51°C to +1.20°C above the annual average) for much Aotearoa New Zealand. Well above average temperatures (>1.20°C above the annual average) occurred in parts of Auckland, Bay of Plenty, Tasman and Fiordland. Near average (within -0.50°C to +0.50°C of average) temperatures occurred in western Waikato, coastal Wairarapa and parts of northern Canterbury and Otago. 2021 was the warmest year on record for New Zealand, based on NIWA's seven-station series which began in 1909.
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Source: [NIWA](https://www.niwa.co.nz/)

Recognise the (degree of) precision required for the context

Ākonga compare the degree of precision used to express rainfall. Compare these measures by referring to a ruler.

Work with integers

Ākonga calculate the difference between the highest and lowest temperatures using an appropriate method (written, mental or digital).

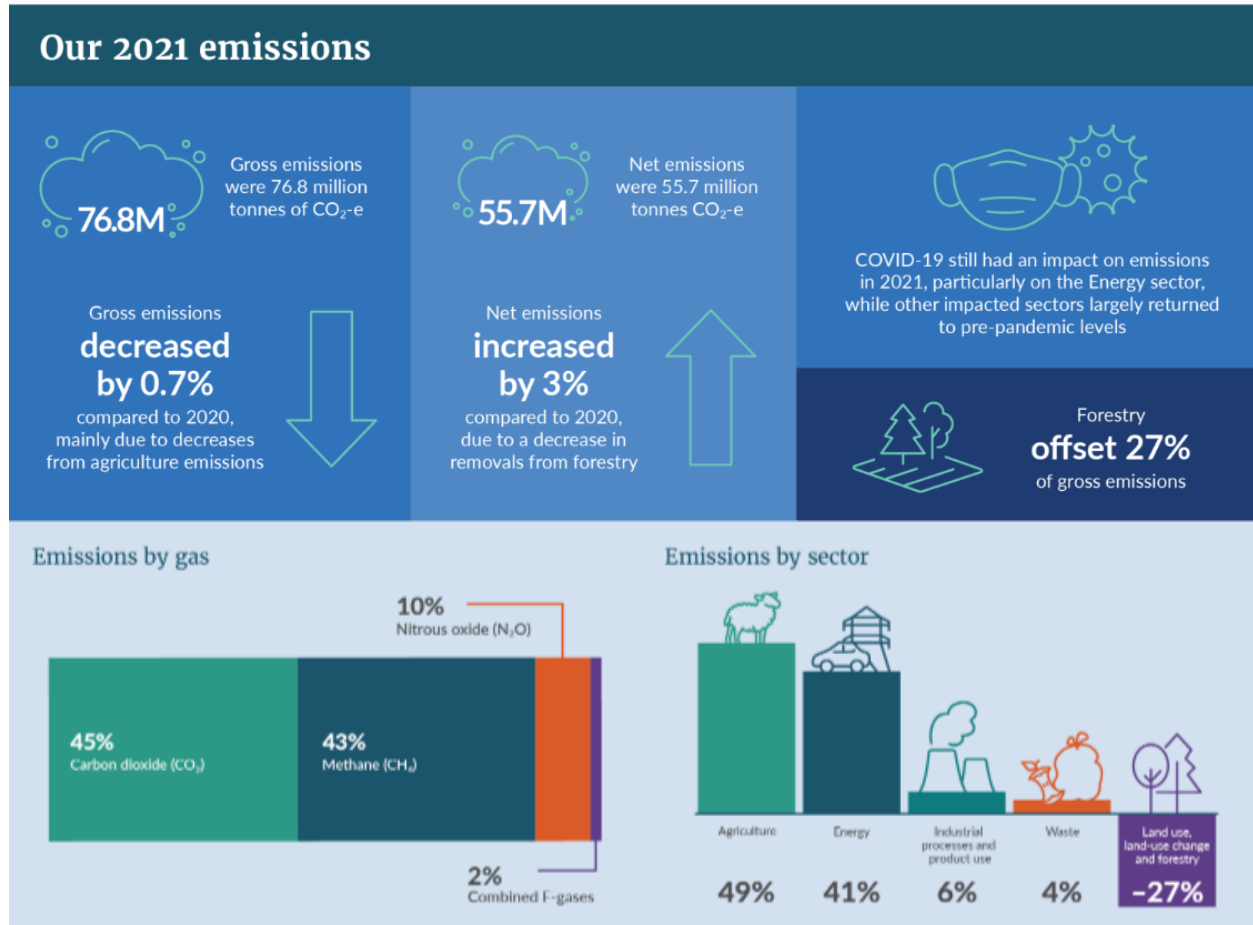
Use and interpret results of the measurement

Ākonga use a map that is to-scale to measure the distance between the two weather extremes. Discuss what this might tell us about climate change.

Calculate averages (including mean)

Ākonga interpret the meaning of average temperature in this context.

Sample numeracy opportunities in Agricultural and Horticultural Science

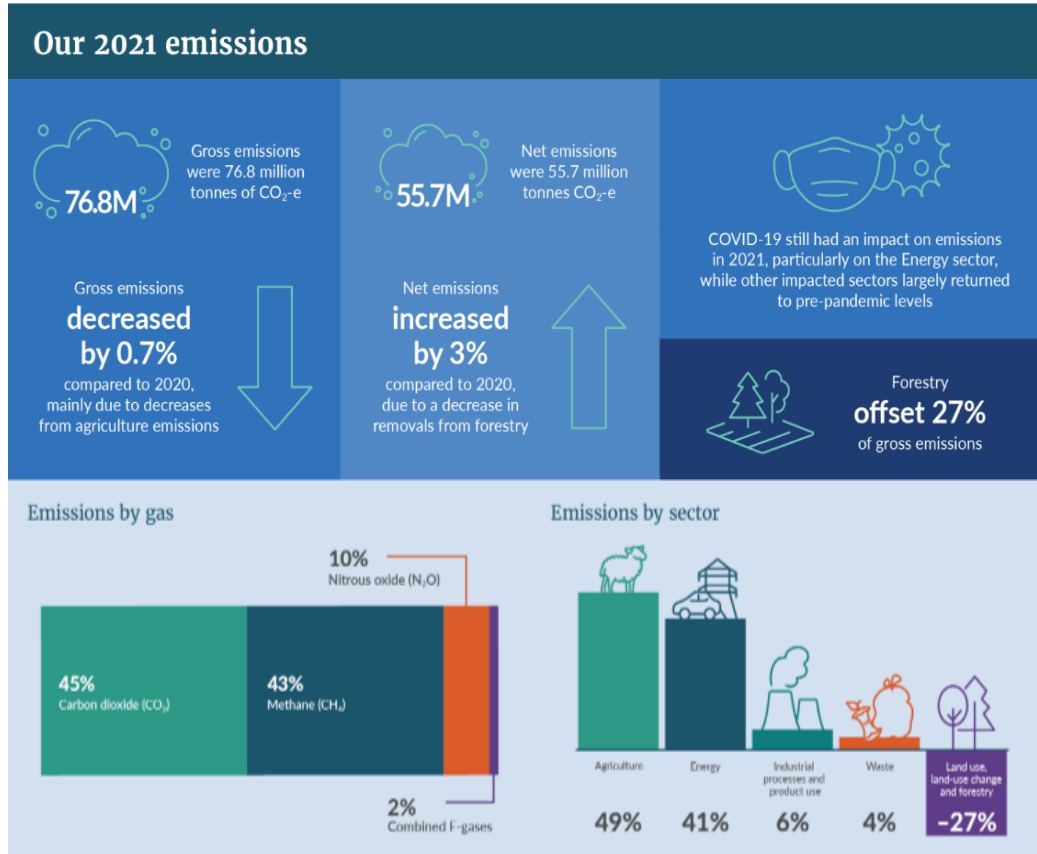


Consider this using the infographic from Manatū mō Te Taiao:

- What does this tell you about emissions in New Zealand?
- What is surprising about this data?
- How can this data be used?
- Is it trustworthy? How do you know?

Source: [Manatū Mō Te Taiao](https://www.manatutai.govt.nz/)

Links to the content ideas for numeracy



Source: [Manatū Mō Te Taiao](#)

Work with decimals and percentages

Ākonga can convert between a decimal and a percentage. They can find percentages of a value and increase and decrease by a percentage and question the purpose of expressing facts as percentages.

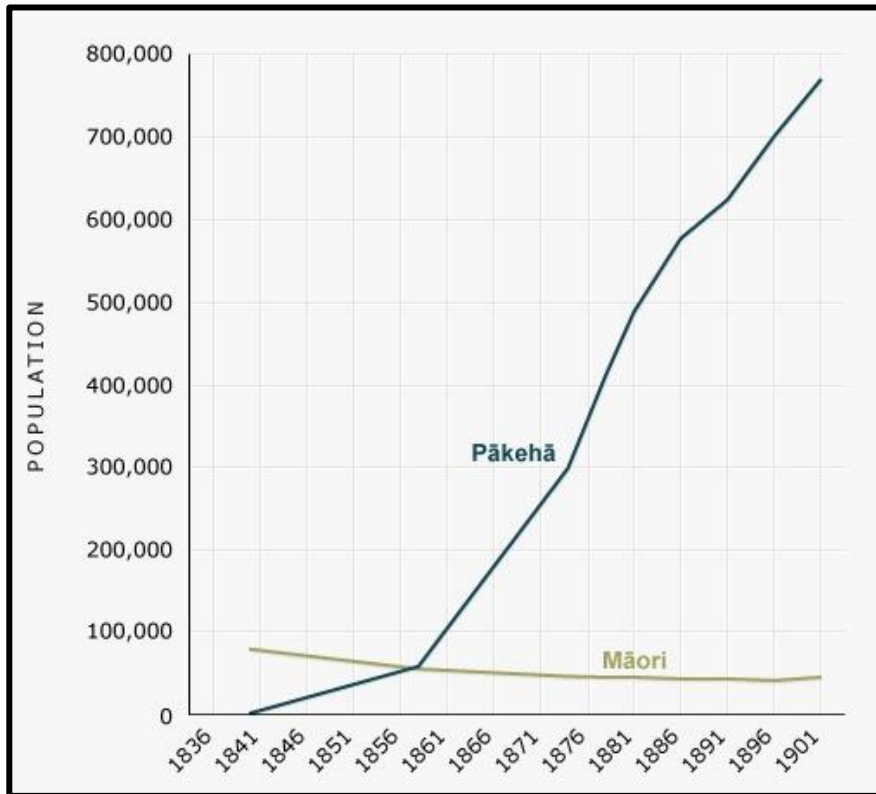
Evaluate statements and representations made by others, based on data that is provided to them

Ākonga interrogate the validity of the data and seek to understand its implications. Posing open questions to learners such as “What do you notice?” and “What do you wonder?” can be powerful ways to understand what your learners are already observing and wanting to further explore.

You can use the following prompts to further direct the conversation. For example, how do you think the data for this graph was gathered? How does this impact the graph?

Sample numeracy opportunities in History

NZ demographics in the 19th century

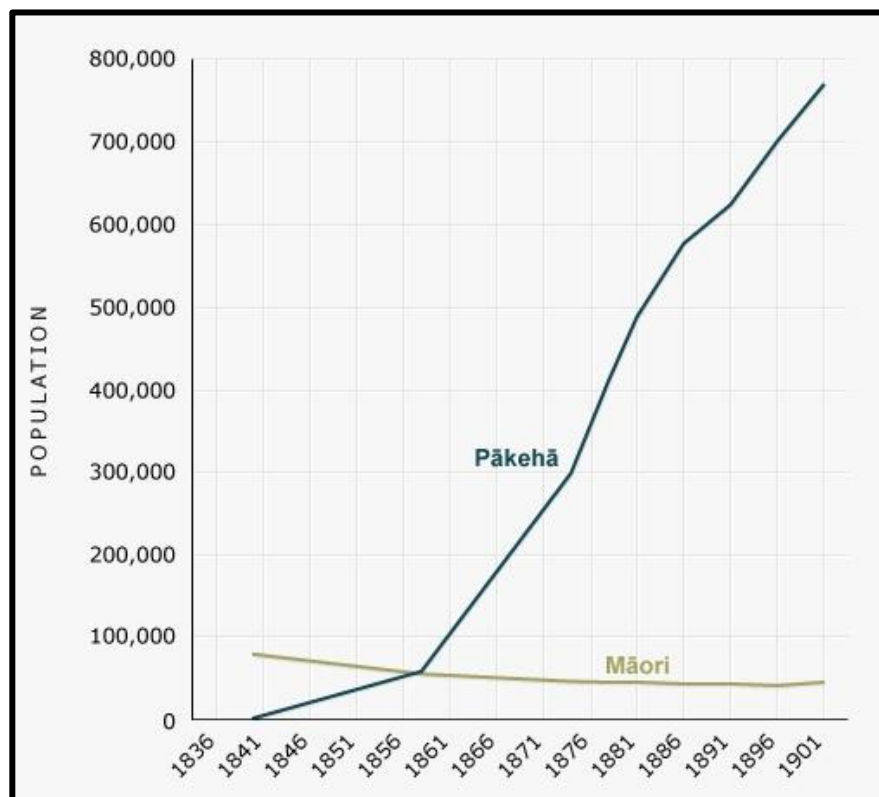


Credit: [NZ History](#)

Consider the following:

- When would you use this graph with ākonga?
- What questions would you ask ākonga to help them make observations from this graph?
- What stories does this graph tell you that you would want to draw on in your classroom?
- What skills do ākonga already need to access the information on this graph?

Links to the content ideas for numeracy



Credit: [NZ History](https://www.nzhistory.govt.nz/population)

Interpret data displays using features such as clustering, centrality, spread, unusual pieces of data, frequencies, and patterns

Evaluate statements and representations made by others, based on data that is provided to them

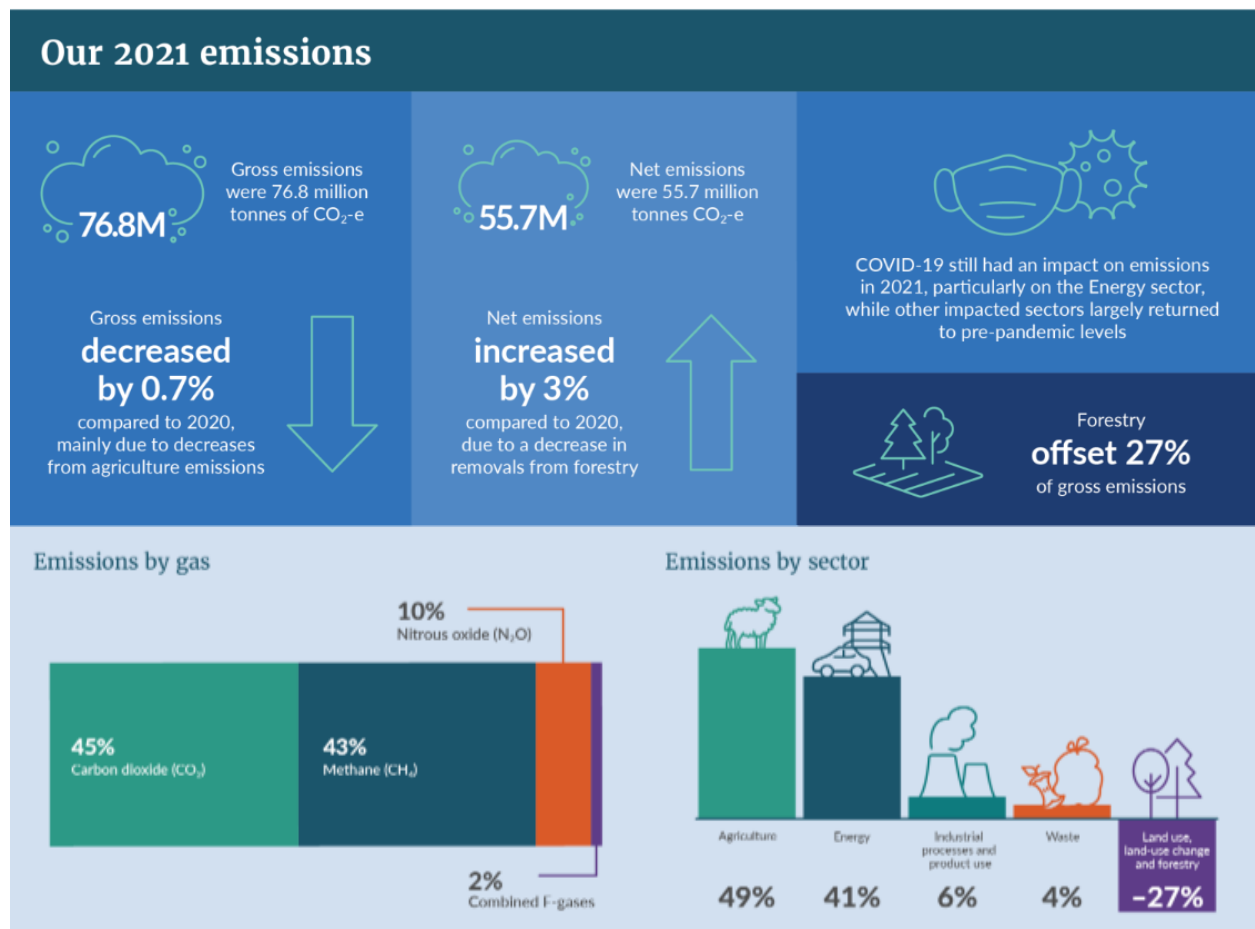
Ākonga identify key features and interpret what they mean in this context.

Key features include:

- The general trend of Pākehā and Māori populations
- The gradient changes in the graph for the population of Pākehā and understanding that the sections where the gradient of the line is steepest indicates a greater population increase in those years than where the line is less steep
- The intersection of the population of Māori and Pākehā.

Ākonga use mathematical language to describe features of the graph eg. trend to describe the direction demographics are moving in between 1836 and 1901 and gradient to refer to steepness of the graph

Sample numeracy opportunities in Geography

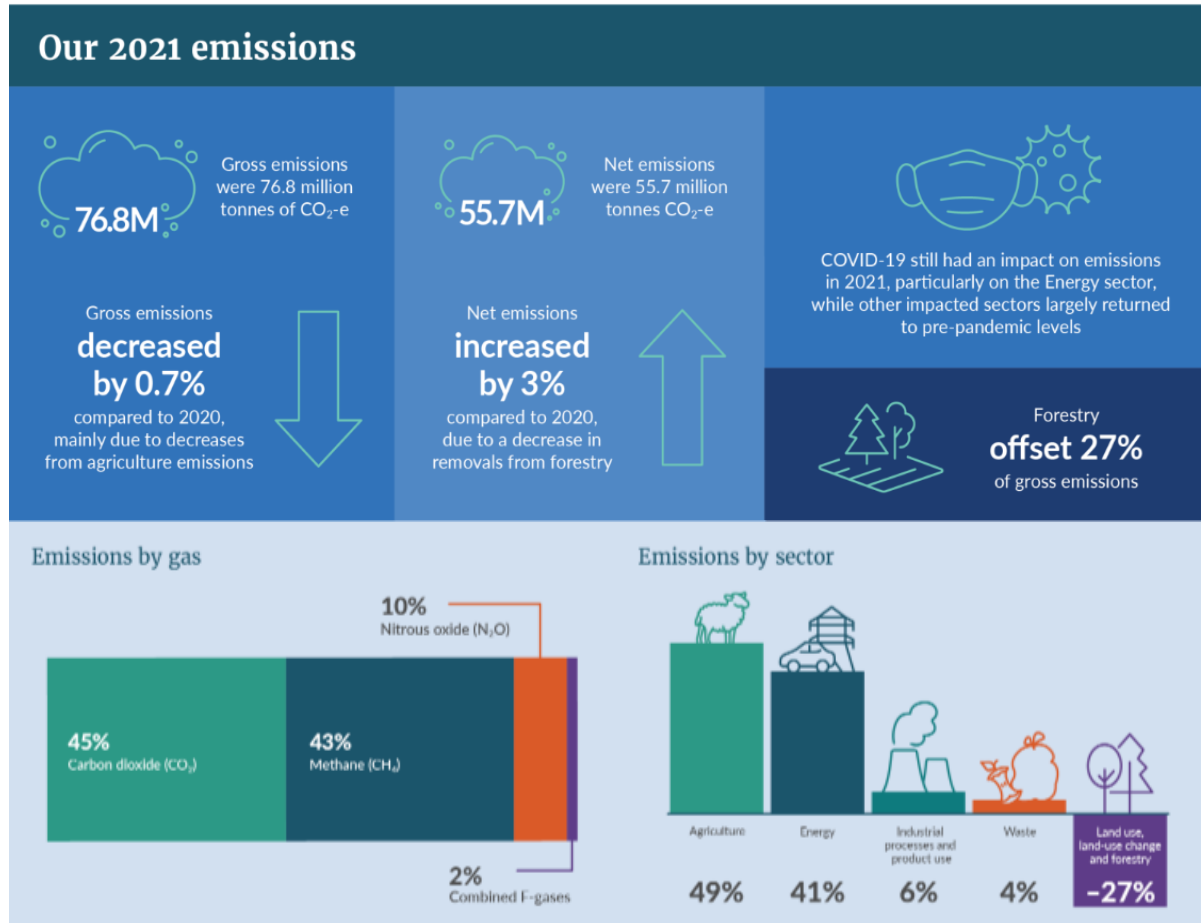


Consider the following:

- What does this tell you about emissions in New Zealand?
- What is surprising about this data?
- How can this data be used?
- Is it trustworthy? How do you know?

Source: [Manatū Mō Te Taiao](https://www.manatū.govt.nz/)

Possible links to the content ideas for numeracy



Source: [Manatū Mō Te Taiao](https://www.manatū.govt.nz/)

Work with decimals and percentages

Ākonga can convert between a decimal and a percentage. They can find percentages of a value and increase and decrease by a percentage and question the purpose of expressing facts as percentages.

Evaluate statements and representations made by others, based on data that is provided to them

Ākonga interrogate the validity of the data and seek to understand its implications.

You can use the following prompts to further direct the conversation: What do you think are some inferences behind this graph? i.e. Events that impacted population

- How do you think the data for this graph was gathered
How does this impact the graph?

Sample numeracy opportunities in Commerce

		
	Samsung Galaxy S II	Samsung Galaxy S
Operating System	Android 2.3	Android 2.2 or 2.1
Processor	1GHz Dual Core	1GHz
Memory (RAM)	1GB	512MB
On-board Storage	16GB or 32GB	16GB
External Storage	Up to 32GB	Up to 32GB
Display Size	4.3-inch	4-inch
Display Resolution	480x800 WVGA/Super AMOLED Plus	480x800 WVGA/Super AMOLED
Camera	8MP + 2MP front-facing	5MP (front-facing on select models)
Flash	LED	LED on select models
Video Recording Resolution	1080p	720p
Size	4.9 x 2.6 x 0.3 inches	4.8 x 2.5 x 0.4 inches
Weight	4.1 ounces	4.2 ounces
Battery	1650mAh	1500mAh
Manufacturer Skin	TouchWiz 4.0	TouchWiz 3.0
NFC Support	Yes	No

Consider the following:

- When would you use this chart with ākonga?
- What questions would you ask ākonga to help them make observations from this chart?
- What information does this chart tell you that you would want to draw on in your classroom?
- What skills do ākonga already need to access the information on this chart?

Credit: [Samsung Galaxy Comparison Chart | Computerworld](#)

Possible links to the content ideas for numeracy

		
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Credit: [Samsung Galaxy Comparison Chart | Computerworld](#)

Recognise the (degree of) precision required for the context

Ākonga convert between imperial and metric measurements.

Work with whole numbers up to billions (MB, GB)

Ākonga identify the mathematical thinking used to persuade consumers of the relative benefits of each phone. They explain how mathematical thinking is used to persuade the consumer to a specific perspective.

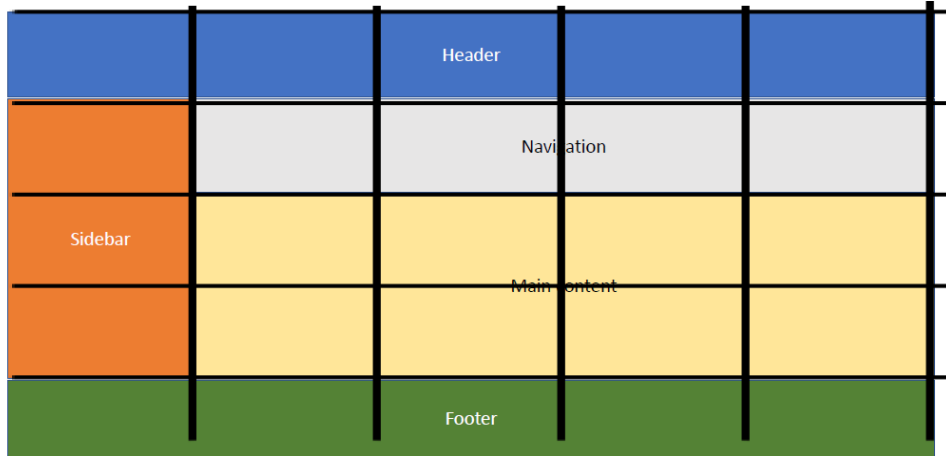
Posing open questions to learners such as “What do you notice?” and “What do you wonder?” can be powerful ways to understand what your ākonga are already observing and wanting to further explore.

You can use the following prompts to further direct the conversation too:

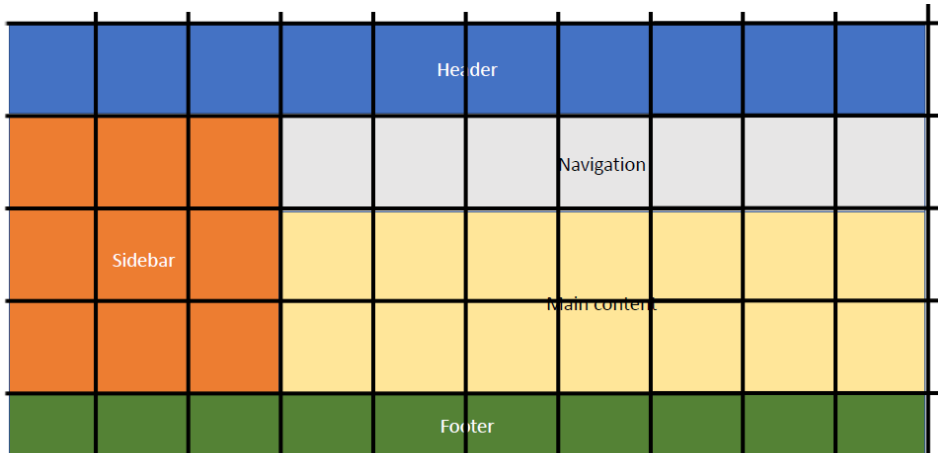
- What do you think are some pūrakau (story) behind this chart? i.e. Why would consumers want certain specifications?
- How do you think the data for this chart was gathered? How does this impact the chart?

Sample numeracy opportunities in Digital Technologies

The grid is 10 columns wide. You can only work with a full grid, so things can't be half a column wide. How will your layout look? How would you express the widths of the columns as fractions?



Can you still work in 5ths? The sidebar is now $\frac{3}{10}$. Can this be simplified?

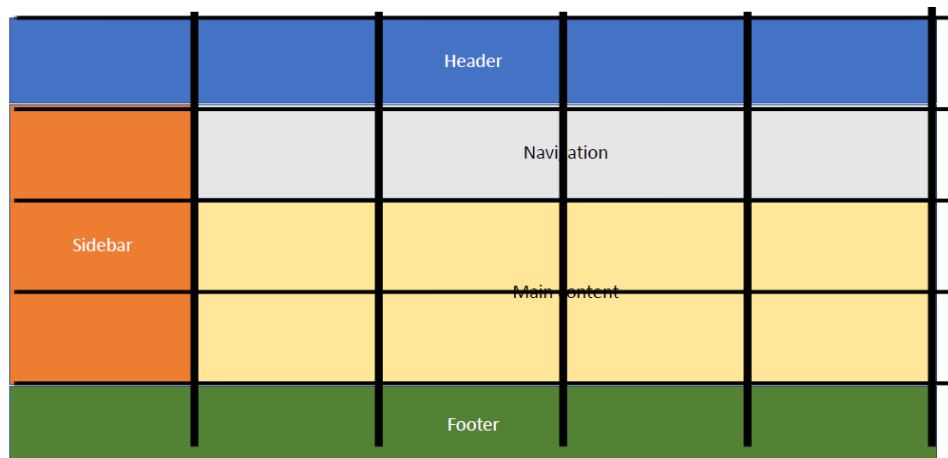


Consider the following:

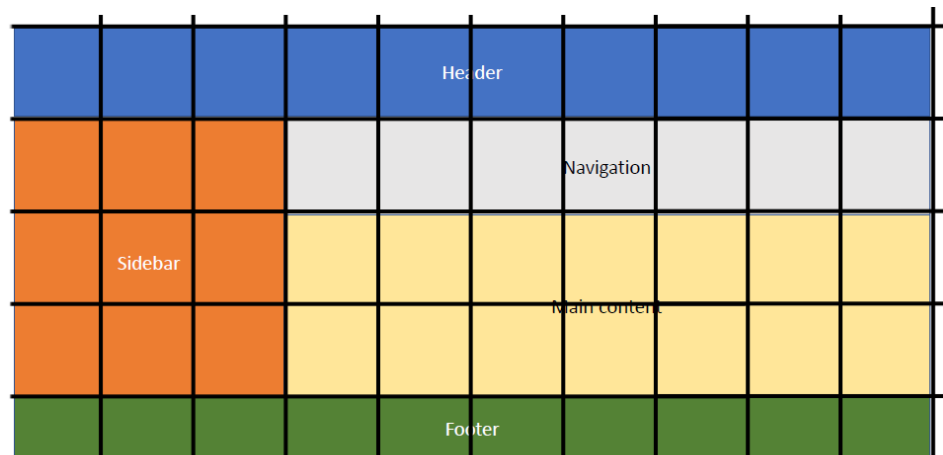
- How might ākonga describe the composition of webpage using mathematical language?
- What mathematics can you see in the images?
- What might ākonga need to know?
- How could ākonga make changes to the project?

Possible links to the content ideas for numeracy

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Work with decimals and percentages

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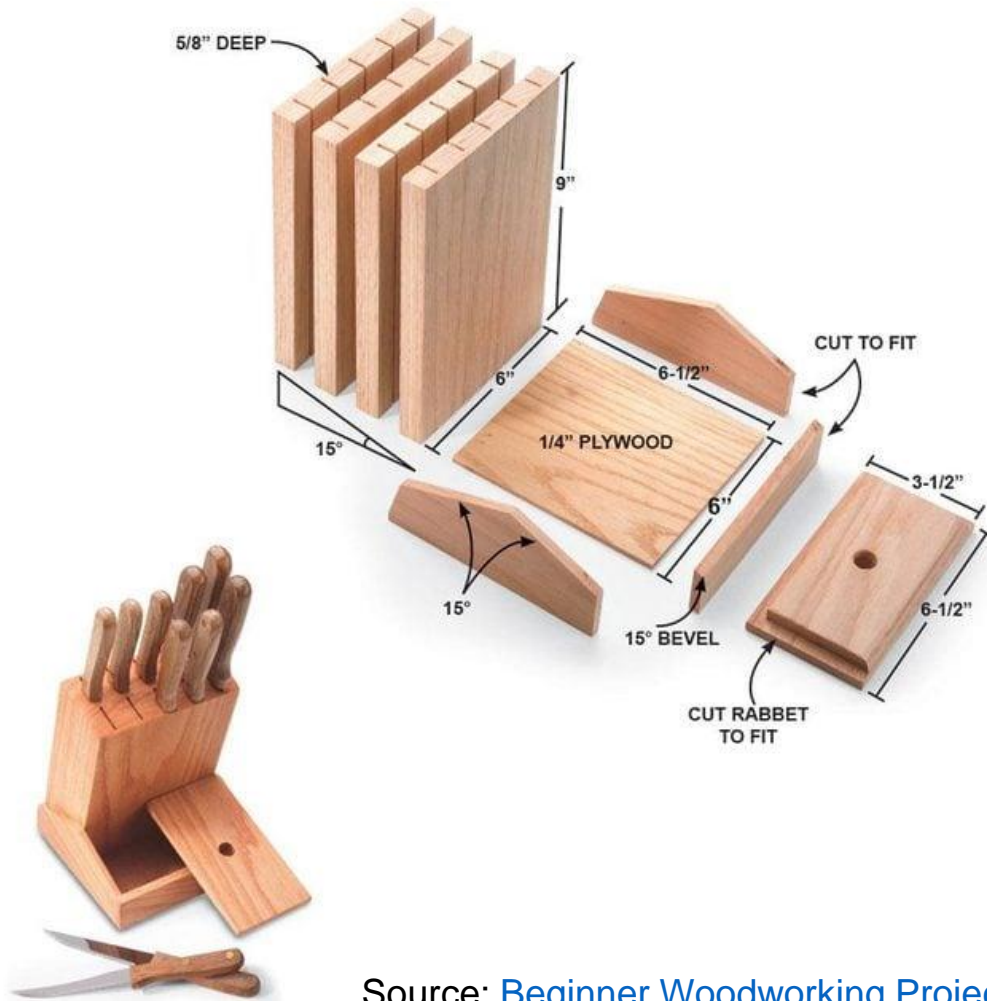
Use and interpret results of measurement

Ākonga consider the tools that are used in developing this webpage. This might include the programming language used and how measurements are used to ensure the components of the page are the right size.

Identify the **units of measure** used in the design and calculate with them.

eg. The measurements here are in pixels. Ākonga need to calculate proportions of total number of pixels.

Sample numeracy opportunities in Design and Visual Communication

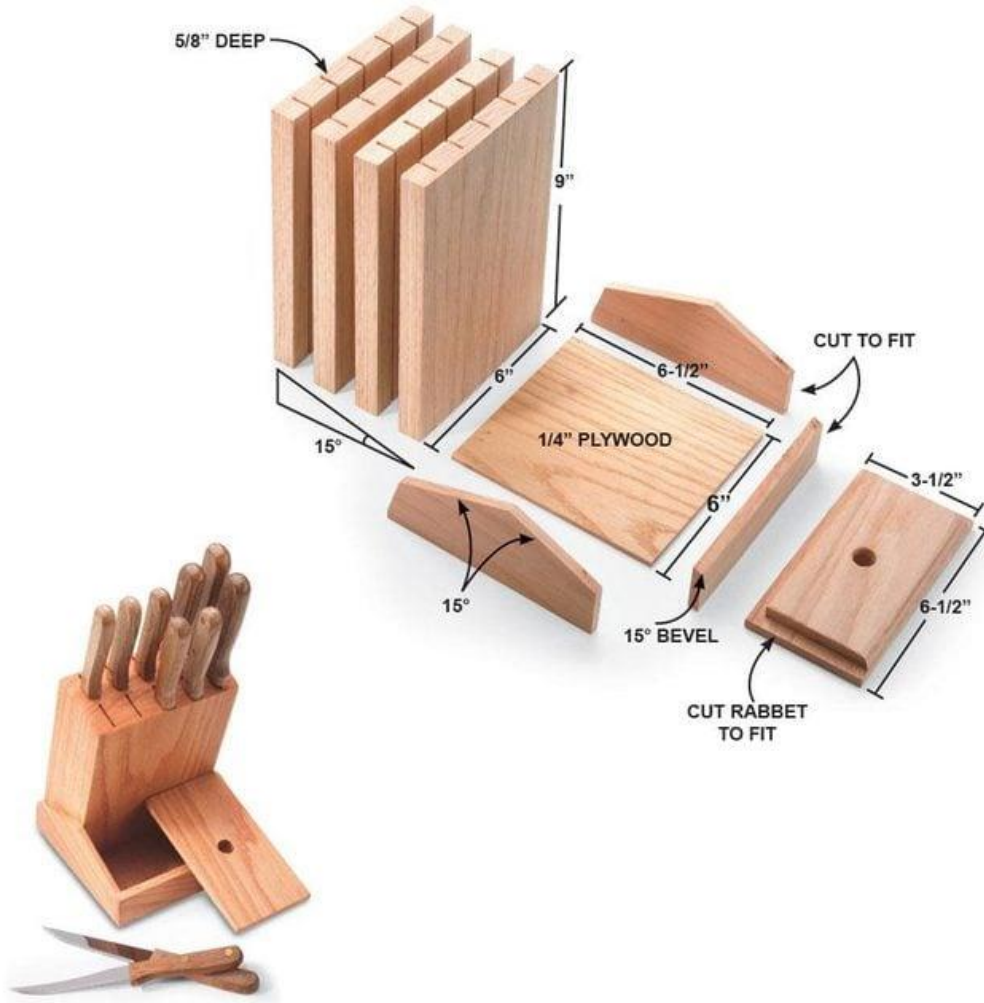


Consider the following:

- What mathematical concepts can you see in the image?
- What is different about how we would do this in Aotearoa New Zealand?
- What else might ākonga need to know?
- How could ākonga make changes to the project?

Source: [Beginner Woodworking Projects: 19 Quick, Easy & Small Ideas \(familyhandyman.com\)](https://familyhandyman.com/19-quick-easy-small-ideas/)

Possible links to the content ideas for numeracy



Recognise the (degree of) precision required

Ākonga understand how accuracy impacts on the quality of finish.

Use and interpret results of measurement

Ākonga consider the resources that are used in developing this outcome. This might include the materials used and how measurement was used to ensure the knife slits are equidistant.

Identify the **units of measure** used in the design and convert to appropriate units.

eg. The measurements here are in inches. Ākonga need to convert these measurements to metric units so that they can replicate the design.

Numeracy in Mathematics and Statistics

Mathematics and Statistics naturally encompasses numeracy.



Working with those around you, consider these questions:

1. How can you support teachers in other learning areas to be clear about the numeracy in their area?
2. How is your school building the numeracy skills of ākonga across the curriculum?
3. How will your school familiarise staff with the Common Practice Model and Maths Sequence, which will support the teaching of maths across the curriculum?
4. How are you building literacy **and** numeracy in Mathematics and Statistics?

The Ministry is in the process of developing a follow-up resource focussed on strategies to support numeracy across learning areas for release in 2024.

We are interested in your feedback. Your views can help develop additional resources. Email ncea.review.education.govt.nz with your feedback on this resource.



We **shape** an **education** system that delivers
equitable and **excellent outcomes**

He mea **tārai** e mātou te **mātauranga**
kia **rangatira** ai, kia **mana taurite** ai ōna **huanga**

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