

Supporting NCEA Numeracy in English



This resource is aligned to the New Zealand Curriculum (2007) and provides support for the teaching and learning of literacy and numeracy in preparation for the NCEA Co-requisite. It aims to support those students who are using the NCEA qualification pathway.

In English, numeracy provides ākonga with tools they can use to “take a stand – to research, evaluate, think, justify, argue an opinion, and share it with confidence.”¹

Numeracy and English have natural areas of overlap in information, media and statistical literacies, each of which requires students to question, critique and corroborate sources of information. Statistics are often used to inform (or misinform) and persuade an audience. By understanding the purpose and effect of statistics, ākonga can be supported to interpret and critically interrogate them, and learn how to use them effectively in their own writing, speaking and crafting of visual texts. By doing so, they extend their “access to the understanding, knowledge and skills they need to participate fully in the social, cultural, political, and economic life of [Aotearoa] New Zealand and the wider world.”²

In English, ākonga develop their numeracy skills when they:

- » make sense of numerical information in informational texts, for example, fractions, percentages and large numbers
- » interpret, analyse and evaluate arguments that involve statistical information
- » use statistics as a tool to inform and persuade others
- » build their understanding of subject-specific meaning of key statistical and probability-related terms.

This Numeracy Pedagogy Guide (NPG) takes a selection of mathematical and statistical content ideas from [Unpacking Numeracy](#)³ and illustrates small, effective steps that you can trial and weave into your teaching practice.



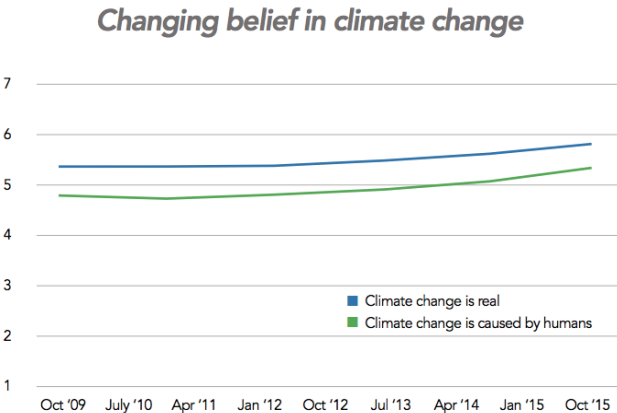
English Numeracy Pedagogy Guide



Operations with numbers	What can this look like in English?	What can I do as a kaiako of English?
Work with whole numbers up to billions, fractions, decimals to 3 places, percentages, and integers	Understand references to large numbers such as millions and billions encountered in texts. <i>Ākonga understand that 'm' and 'b' can be used as abbreviations for a million and a billion.</i> <i>Ākonga recognise that millions and billions can be used in a figurative sense as well as mathematically.</i> <i>Ākonga make sense of percentages in informational texts by relating them to approximate fractions and recognising whether they are referring to 'a few', 'many', or 'most' of a wider group.</i> <i>After reading the online article ‘Greed and destruction’: Call for closure of all scallop fisheries / RNZ News, ākonga can explain the significance of 93 percent of scallop populations disappearing in the past 10 years as being ‘most of the scallop population’.</i> <i>After reading the online article Composting initiative to ‘supercharge’ Māngere marae’s good works / RNZ News, ākonga can explain what percentage of waste in Auckland rubbish collections comes from businesses</i>	When ākonga encounter large numbers in texts, discuss whether the numbers are being used figuratively or literally. If necessary, clarify that one million is one thousand thousands, and a billion is one thousand millions⁴. When ākonga encounter percentages in texts, reinforce that percentages describe a proportion of a whole. This means, for example, that 25 percent of the population of Ōtepoti is fewer than 25 percent of Tāmaki Makaurau because the two populations differ in size. Explore ways to use percentages to craft ‘for or against’ arguments using the same set of statistics by highlighting the impact of language on readers’ perceptions, for example, ‘a skant 25 percent’ versus, ‘a concerning 25 percent’ of people. Discuss how writers often use approximations with basic fractions rather than percentages in information texts because many readers find these easier to interpret. For example, 35 percent might be reframed as ‘a little over one third’. Discuss whether saying ‘one in four people’ is more persuasive than saying ‘25 percent of people’ (despite these being equivalent proportions) and ways that this could be shown in a diagram, for example:

Spatial properties and representations of objects	What can this look like in English?	What can I do as a kaiako of English?
Recognise symmetry	Identify symmetry⁵ in poetry. <i>Ākonga identify symmetry in poetry, for example, in its rhythm or structure.</i> <i>Ākonga use symmetry to create a found poem, for example, decreasing the number of words in each line of a poem by one to reach a midway point in a poem, and then increasing the number of words by one until the mirror image of the poem is complete.</i>	Provide examples of poems that use symmetry as a device, for example: » Mirror by Rita Dove » The Back Seat of My Mother's Car by Julia Copus. Ākongā may also enjoy reading and creating poems based on the Fibonacci sequence.
Transform objects to design for purpose (i.e. enlarge, reflect, rotate, and translate)	Use repetition as form of translation in composition <i>Ākonga explore ways to use repetition in compositions, for example, in rhyme schemes and metre.</i>	Explore repetition in a range of genres, for example, rhyme schemes and metre in poetry. and Teachers could also look at rhyme schemes in poetry and metre Sonnets are good example of poems that have set rhyme schemes and metre (iambic pentameter)

Measurement	What can this look like in English?	What can I do as a kaiako of English?
Use and interpret results of measurement (including timetables and time charts).	Understand the approximate size of units commonly referred to in informational texts, for example, tonnes, metres, degrees Celsius and hectares. Ākonga use their knowledge of measurement to estimate and demonstrate the length of the waka described in this online article Iwi join together to welcome back 300-year-old waka RNZ, relative to the length of their classroom. Ākonga discuss how references to degrees Celsius and tonnes in the online article Marlborough Sounds salmon dying after hot summer RNZ relate to the author's purpose and audience. Understand different ways to describe time in information texts, for example, eighteen months is the same as a year and a half.	Highlight references to measurements in online articles and discuss how the inclusion of specific measurements relates to the purpose of the article, for example, to inform or persuade readers. Discuss assumptions the author of a text has made about readers' knowledge of (and associations with) different units, for example, tonnes and metres. If necessary, explain that one tonne is 1000 kilograms and one hectare is equivalent to two rugby fields⁶.

Statistics	What can this look like in English?	What can I do as a kaiako of English?
Recognise and use appropriate data displays to investigate questions or claims for summaries, comparisons and simple time series situations. 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.	Make connections between written statements and representations such as graphs, tables and infographics. <i>Ākonga make connections between written information and information displayed in graphs while reading summary excerpts from The New Zealand Attitudes and Values Study (2020).</i> Interpret the features of visual displays. <i>Ākonga evaluate how easy it is for readers to make sense of information provided in a graph. For example, a graph about beliefs in climate change (see page 7 of The New Zealand Attitudes and Values Study (2020)) is hard to interpret because the vertical axis doesn't have a label but the graph does show that there is likely to be a relationship between people believing that climate change is real and people believing that it is caused by humans because both follow the same trend.</i>  Investigate claims in articles and critically evaluate the reliability of the article. <i>Ākonga identify that the resource is from a reputable source (The University of Auckland) and that the excerpts are all based on published research, with links to the research provided.</i> Understand a writer's purpose for including statistical statements and data displays in texts.	When reading texts that include a data display, support ākonga to make connections between the display and written information by asking questions such as: » <i>What connections can you make between information in the text and in the graph?</i> » <i>What conclusions can you draw from this graph?</i> » <i>How effective is the graph in supporting the reader to understand a key idea or message in the text?</i> » <i>What gaps might there be in the information it displays?</i> » <i>How else could this information have been displayed?</i> When working with informational texts based on survey information, provide questions that support ākonga to evaluate the credibility and reliability of statistical data, for example: » <i>What was the purpose of the study?</i> » <i>Who collected it?</i> » <i>What information was gathered?</i> » <i>When was the information collected?</i> » <i>How was the information gathered?</i> » <i>Is the information consistent with other sources?</i> Support ākonga to make connections between the purpose of a text and the use of statistics, for example, what conclusions the writer may want readers to draw from them, whether they have been represented in a way that is clear and easy to understand, and whether they are reliable.

	<i>Ākonga identify that the resource provides a snapshot of information about attitudes and values that may be of interest to New Zealanders. The authors use statistical statements and data displays because their summaries are based on research.</i> Recognise that statistics can be used in ways that are misleading. <i>Ākonga identify how statistics are often included in the 'fake news' articles provided in this Netsafe resource Trainer - Your News Bulletin.</i>	
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Footnotes

¹ Ministry of Education. Rationale: Why study English? Te Kete Ipurangi. [Rationale / English / Home - Senior Secondary](#)

² Ministry of Education. The New Zealand Curriculum online, English: What is English about? Te Kete Ipurangi. [The New Zealand Curriculum](#)

³ The Unpacking Numeracy document outlines key content that ākonga will need to understand in order to achieve NCEA Numeracy.

⁴ [Place value houses](#) are a useful tool for supporting ākonga to make sense of large numbers, comparing numbers they are familiar with (such as one hundred) with larger numbers.

⁵ Reflectional or line symmetry means that one half of a shape is a mirror image of the other half. In English, this type of symmetry is evident when one half of a piece of writing (often a poem) is a mirror image of the other half. This can be visual (e.g., symmetry in a pattern poem) or rhythmic (e.g., steadily decreasing and then steadily increasing the number of syllables in lines of a poem).

⁶ Although hectares and tonnes are regularly referred to in news articles, they are not specifically part of the NCEA numeracy standard. However, it's useful for ākonga to understand that one tonne is 1000 kilograms and one hectare is 10,000 m² (which is equivalent to two rugby fields).