Numeracy across Geography,
Levels 7–10

Linking the Numeracy Learning Progressions
and the Victorian Curriculum

Numeracy underpins learning across the Victorian Curriculum F–10. While much of the explicit teaching of numeracy occurs in the Mathematics learning area, it is strengthened, made specific and extended in other learning areas as students engage in a range of learning activities with significant numeracy demands. The Numeracy Learning Progressions are designed to assist schools and teachers in all learning areas to support their students to successfully engage with the numeracy demands of the Victorian Curriculum F–10.

**The Numeracy Learning Progressions are provided as advisory material only and are not mandated as part of the Victorian Curriculum F–10. To view the Geography curriculum, visit the** [**Victorian Curriculum F–10 website**](https://victoriancurriculum.vcaa.vic.edu.au/the-humanities/geography/curriculum/f-10)**.**

In Geography students develop numeracy capability as they investigate concepts fundamental to geography, for example the effects of location and distance, spatial distributions and the organisation and management of space within places. They apply numeracy skills in geographical analysis by counting and measuring, constructing and interpreting tables and graphs, calculating and interpreting statistics, and using statistical analysis to test relationships between variables. In constructing and interpreting maps, students work with numerical concepts of grids, scale, distance, area and projections. Numeracy skills are also used when evaluating natural events or phenomena, such as when calculating the likelihood of rainfall as a percentage or the wind speeds of a cyclone.

The most relevant Numeracy Learning Progressions for Geography are Quantifying numbers, Operating with percentages, Comparing units, Positioning and locating, Understanding units of measurement and Interpreting and representing data.

Although number is an abstract concept that can be represented by a word, symbol (numeral) or image, it is central to quantitative thinking. **Quantifying numbers** describes how a student becomes increasingly able to count, recognise, read and interpret numbers expressed in different ways. This Learning Progression outlines key understandings needed to process, communicate and interpret numerical information in a variety of contexts. Students produce number names of any size and understand and represent place value, including ordering decimal numbers and negative numbers.

**Operating with percentages** in Geography involves students operating with percentages with a focus on understanding percentages and relative sizes. When exploring statistics students identify percentage increase and decrease.

**Comparing units** involves students understanding ratios, rates and proportions, particularly in regard to cartography and map interpretations.

**Positioning and locating** is a frequent numeracy demand in Geography. Students become increasingly able to recognise the attributes of position and location. A student learns to manipulate representations of shapes and objects regarding position and location, and to visualise and orientate objects to solve problems in spatial contexts, such as navigating. They use scales on maps is an application of proportional reasoning.

**Understanding units of measurement** involves students using and converting formal units of measurement when investigating landforms and applying understanding to measurements used in maps.

**Interpreting and representing data** involves students collecting, interpreting and displaying data in tables and graphical forms when making comparisons between geographical statistics.

Numeracy in the context of Geography

The tables in this document make explicit the links between the Numeracy Learning Progressions and content descriptions in both strands of the Geography curriculum. Relevant extracts of the achievement standards for Geography are also included.

In addition to these Numeracy Learning Progression links, the approximate relation to the Victorian Curriculum F–10 Mathematics levels has been included. For further information on the alignment of the Numeracy Learning Progressions and the Victorian Curriculum F–10 Mathematics, please refer to the [Numeracy Learning Progressions map on the VCAA website](https://www.vcaa.vic.edu.au/curriculum/foundation-10/crosscurriculumresources/Pages/Numeracy.aspx).

The ‘Numeracy in context’ section of the table provides examples of learning that connect to the Numeracy Learning Progressions, allowing for a deeper understanding of numeracy demands.

Links to Geographical Concepts and Skills

Place, space and interconnection

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| **Relevant Victorian Curriculum achievement standard extracts** | **Relevant Victorian Curriculum content descriptions** | **Numeracy Learning Progression links (plus approximate relation to Victorian Curriculum F–10 Mathematics levels)** |
| **Geography Levels 7 and 8** |
| * … students explain processes that influence the characteristics of places.
* They identify, analyse and explain interconnections and spatial characteristics and identity and explain their implications.
 | Explain processes that influence the characteristics of places [(VCGGC099)](https://victoriancurriculum.vcaa.vic.edu.au/Curriculum/ContentDescription/VCGGC099)Identify, analyse and explain spatial distributions and patterns and identify and explain their implications [(VCGGC100)](https://victoriancurriculum.vcaa.vic.edu.au/Curriculum/ContentDescription/VCGGC100)Identify, analyse and explain interconnections within places and between places and identify and explain changes resulting from these interconnections [(VCGGC101)](https://victoriancurriculum.vcaa.vic.edu.au/Curriculum/ContentDescription/VCGGC101) | **Quantifying numbers*** Understanding place value (3–6)

**Positioning and locating*** Using formal maps and plans (3)

**Measuring time*** Relating units of time (4–5)
* Time zones (6–8)

**Understanding units of measurement*** Using formal units (3–5)

**Understanding chance*** Calculating probabilities (6–8)

**Interpreting and representing data*** Collecting and displaying data (4–5)
 |
| **Geography Levels 9 and 10** |  |
| * … students predict changes in the characteristics of places over time and identify implications of change for the future.
* They identify, analyse, and explain significant spatial distributions and patterns and significant interconnections within and between places, and identify and evaluate their implications, over time and at different scales
 | Predict changes in the characteristics of places over time and identify the possible implications of change for the future [(VCGGC127)](https://victoriancurriculum.vcaa.vic.edu.au/Curriculum/ContentDescription/VCGGC127)Identify, analyse and explain significant spatial distributions and patterns and identify and evaluate their implications, over time and at different scales [(VCGGC128)](https://victoriancurriculum.vcaa.vic.edu.au/Curriculum/ContentDescription/VCGGC128)Identify, analyse and explain significant interconnections within places and between places over time and at different scales, and evaluate the resulting changes and further consequences [(VCGGC129)](https://victoriancurriculum.vcaa.vic.edu.au/Curriculum/ContentDescription/VCGGC129) | **Positioning and locating*** Using formal maps and plans (3)
* Interpreting maps and plans (4–5)

**Interpreting and representing data*** Interpreting data scales (6)
* Graphical representations of data (8)
 |
| **Numeracy in context – Geography, Levels 7–10** |
| **Geography Levels 7 and 8** |
| **Quantifying numbers**Students identify, analyse and explain characters and places, which includes an understanding of number and place value. Students explore locations involving height, land size and population, and make comparisons. They read, write and record numbers, applying their knowledge of place value, including ordering negative numbers when exploring temperature. **Positioning and locating**When exploring characteristics and places, students interpret formal maps, including using a scale ratio, compass directions and an understanding of longitude and latitude. **Measuring time**Students explore geographical processes that influence characteristics of places. They explore changes over time and implications of these changes. Students determine elapsed time using different units and identify seasons associated with time zones.**Understanding units of measurement**Students explore spatial characteristics and measure, read and convert standard units of measurement. **Understanding chance**When exploring characteristics and implications, students describe the likelihood of events occurring, using fractions or percentages, and discuss their implications. **Interpreting and representing data**Students collect, sort and analyse data, as well as make comparisons and connections between places. They select data collection methods to suit the context and justify their selection, and they interpret data displayed using a multi-unit scale, reading values between the marked units. |
| **Geography Levels 9 and 10** |
| **Positioning and locating**When exploring characteristics and places students interpret formal maps, including using a scale ratio, compass directions and an understanding of longitude and latitude**Interpreting and representing data**Students collect, interpret and review data to explain significant interconnections between places and use this work to assist with evaluating change. They select data collection methods to suit the context and justify their choices. They determine and calculate the most appropriate statistic to describe their data and support reasoning.When exploring geographical statistics including population, students make reasonable judgements and justify criticisms of data sources (for example, inappropriate sampling from populations). In the sub-strand Place, space and interconnection, students identify, analyse and explain the interconnections between the distribution of rainfall and different biomes and use graphical representations relevant to the purpose of the collection of the data. |

Data and information

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| **Relevant Victorian Curriculum achievement standard extracts** | **Relevant Victorian Curriculum content descriptions** | **Numeracy Learning Progression links (plus approximate relation to Victorian Curriculum F–10 Mathematics levels)** |
| **Geography Levels 7 and 8** |
| * They ethically collect, record and select relevant geographical data and information from useful sources.
* They select and represent data and information in a range of appropriate forms including maps at different scales that conform to cartographic conventions.
* They analyse maps and other geographical data and information, and use geographical terminology, to develop identifications, descriptions, explanations and conclusions.
* They use digital and spatial technologies to represent and analyse data and information.
 | Collect and record relevant geographical data and information from useful primary and secondary sources, using ethical protocols [(VCGGC102)](https://victoriancurriculum.vcaa.vic.edu.au/Curriculum/ContentDescription/VCGGC102)Select and represent data and information in different forms, including by constructing appropriate maps at different scales that conform to cartographic conventions, using digital and spatial technologies as appropriate [(VCGGC103)](https://victoriancurriculum.vcaa.vic.edu.au/Curriculum/ContentDescription/VCGGC103)Analyse maps and other geographical data and information using digital and spatial technologies as appropriate, to develop identifications, descriptions, explanations and conclusions that use geographical terminology [(VCGGC104)](https://victoriancurriculum.vcaa.vic.edu.au/Curriculum/ContentDescription/VCGGC104) | **Quantifying numbers*** Understanding place value (3–6)

**Comparing units*** Ratios (8)

**Positioning and locating*** Using formal maps and plans (3)
* Interpreting maps and plans (4–5)

**Understanding units of measurement*** Converting units (6–7)
* Calculating measurements (8)

**Interpreting and representing data*** Collecting and displaying data (4–5)
* Interpreting data scales (6)
 |
| **Geography Levels 9 and 10** |  |
| * They ethically collect relevant geographical data and information from reliable and useful sources.
* They select, organise and represent data and information in different forms, using appropriate digital and spatial technologies and through special purpose maps that conform to cartographic conventions.
* They analyse and evaluate geographical data, maps and information using digital and spatial technologies and Geographical Information Systems as appropriate to develop identifications, descriptions, explanations and conclusions that use geographical terminology.
 | Collect and record relevant geographical data and information, using ethical protocols, from reliable and useful primary and secondary sources [(VCGGC130)](https://victoriancurriculum.vcaa.vic.edu.au/Curriculum/ContentDescription/VCGGC130)Select, organise and represent data and information in different forms, including by constructing special purpose maps that conform to cartographic conventions, using digital and spatial technologies as appropriate [(VCGGC131)](https://victoriancurriculum.vcaa.vic.edu.au/Curriculum/ContentDescription/VCGGC131)Analyse and evaluate data, maps and other geographical information using digital and spatial technologies and Geographical Information Systems as appropriate, to develop identifications, descriptions, explanations and conclusions that use geographical terminology [(VCGGC132)](https://victoriancurriculum.vcaa.vic.edu.au/Curriculum/ContentDescription/VCGGC132) | **Operating with percentages*** Understanding percentages and relative size (6)
* Adding a percentage as multiplying (9)
* Repeatedly adding a percentage (10)

**Positioning and locating*** Using formal maps and plans (3)
* Interpreting maps and plans (4–5)

**Interpreting and representing data*** Interpreting data scales (6)
* Shape of data displays (7)
* Recognising bias (9–10)
 |
| **Numeracy in context – Geography, Levels 7–10** |
| **Geography Levels 7 and 8** |
| **Quantifying number** Students collect and record geographical data that involves an understanding of place value, including ordering negative numbers.**Comparing units**Students construct appropriate maps at different scales, they interpret ratios as a comparison between the same units of measurement and they express ratios as equivalent fractions or percentages. In cartography students apply knowledge of ratios and scale to increase or decrease size.**Understanding units of measurement**Students identify standard units of measurement in cartography and convert between standard units of measurement, including converting millimetres to centimetres and metres to kilometres when calculating distance. They recognise the relationship between metric units of measurement and the base-10 place value system.**Positioning and locating**Students locate position on maps using grid references, they identify features on maps and plans and they describe routes using landmarks and directional language. Students interpret the scale as a ratio used to create plans, drawings or maps. Students interpret maps involving scale, compass directions, and latitude and longitude to locate position. **Interpreting and representing data**Students collect and record geographical data from useful primary and secondary sources. They determine and calculate the most appropriate statistic to describe the data and justify data collection methods. Students select and represent their data in a variety of forms that are relevant to the purpose of the data.  |
| **Geography Levels 9 and 10** |
| **Operating with percentages**Students refer to percentages when gathering and reviewing quantitative evidence. They explore percentage increase and decrease over time. **Positioning and locating**Students locate position on maps using grid references, they identify features on maps and plans and they describe routes using landmarks and directional language. Students interpret the scale as a ratio used to create plans, drawings or maps. They interpret maps involving scale, compass directions, and latitude and longitude to locate position. **Interpreting and representing data**Students collect and record geographical data and information from secondary sources. They identify the most appropriate statistics to describe and illustrate data, including climate graphs, compound column graphs, population pyramids, scatter plots, tables, and topographic, thematic, choropleth and weather maps. They analyse satellite images and aerial photographs as sources of data. They use simple descriptive statistics such as mean, median and mode as measures when reviewing gathered data. They select a climate graph to illustrate the characteristics of a place, a line graph to demonstrate change over time and a population pyramid to show the structure of a population.Students use features of graphical representations to make predictions about changes to an environment being investigated over time and interpret graphs of continuous variables to determine growth rate or change in things such as population. Students understand the impact of outliers as anomalies in how a data set can be interpreted, for example understanding the impact of an isolated severe weather event on average rainfall.They justify criticisms of data sources that include biased statistical elements, such as from inappropriate sampling from populations.Students recognise and explain bias as a possible source of error in media reports of survey data and evaluate the validity of evidence provided by data to test claims on attitudes to human-induced environmental change. |

Links to Geographical Knowledge, Levels 7 and 8

Achievement standard, Levels 7 and 8

By the end of Level 8, students explain processes that influence the characteristics of places. They identify, analyse and explain interconnections and spatial characteristics and identity and explain their implications.

They compare strategies for a geographical challenge, taking into account a range of factors and predict the likely outcomes.

They ethically collect, record and select relevant geographical data and information from useful sources. They select and represent data and information in a range of appropriate forms including maps at different scales that conform to cartographic conventions. They analyse maps and other geographical data and information, and use geographical terminology, to develop identifications, descriptions, explanations and conclusions. They use digital and spatial technologies to represent and analyse data and information.

Water in the world

| Relevant Victorian Curriculum content descriptions | Numeracy Learning Progression links (plus approximate relation to Victorian Curriculum F–10 Mathematics levels) |
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| **Geography Levels 7 and 8**Classification of environmental resources and the forms that water takes as a resource [(VCGGK105)](https://victoriancurriculum.vcaa.vic.edu.au/Curriculum/ContentDescription/VCGGK105)Ways that flows of water connect places as they move through the environment and the ways this affects places [(VCGGK106)](https://victoriancurriculum.vcaa.vic.edu.au/Curriculum/ContentDescription/VCGGK106)The quantity and variability of Australia’s water resources compared with those in other continents and how water balance can be used to explain these differences [(VCGGK107)](https://victoriancurriculum.vcaa.vic.edu.au/Curriculum/ContentDescription/VCGGK107)Nature of water scarcity and the role of humans in creating and overcoming it, including studies drawn from Australia and West Asia and/or North Africa [(VCGGK108)](https://victoriancurriculum.vcaa.vic.edu.au/Curriculum/ContentDescription/VCGGK108)The spiritual, economic, cultural and aesthetic value of water for people, including Aboriginal and Torres Strait Islander peoples and peoples of the Asia region, that influence the significance of places [(VCGGK109)](https://victoriancurriculum.vcaa.vic.edu.au/Curriculum/ContentDescription/VCGGK109)Causes of an atmospheric or hydrological hazard and its impacts on places, and human responses to it to minimise harmful effects on places in the future [(VCGGK110)](https://victoriancurriculum.vcaa.vic.edu.au/Curriculum/ContentDescription/VCGGK110) | **Operating with percentages*** Understanding percentages and relative size (6)

**Positioning and locating*** Using formal maps and plans (3)
* Interpreting maps and plans (4–5)

**Understanding units of measurement*** Using formal units (3–5)
* Converting units (6–7)

**Interpreting and representing data*** Collecting and displaying data (4–5)
* Shape of data displays (7)
 |
| **Numeracy in context – Geography, Levels 7 and 8** |
| **Operating with percentages**Students investigate water in the world and understand percentage as a relative size. They describe water usage and capacity with descriptive terms such as ‘75% full’ or ‘50% larger’ and apply knowledge of percentages in the likelihood of events occurring, including the likelihood of rainfall in a given season. **Positioning and locating**Students are able to recognise the attributes of position and location. They use scales on maps and use grid references. Students explore water scarcity around the world and use directional language, compass directions, and longitude and latitude to locate position.**Understanding units of measurement**The sub-strand Water in the world involves the measurement of volume and capacity. Students apply knowledge of formal units of measurement including millilitres (mL), litres (L) and kilolitres (kL).**Interpreting and representing data**Students collect data on resources (renewable and non-renewable; finite and infinite) and investigate examples of each type. They select data collection methods to suit the context and justify their choices, and they represent data in graphical displays. Students use simple descriptive statistics (mean and median) to represent typical values and determine the most accurate statistic to describe specific data.Interpreting and representing data is frequently evident in the sub-strand Water in the world as students review global statistics as well as water usage and scarcity around the world. |

Place and liveability

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| Relevant Victorian Curriculum content descriptions | Numeracy Learning Progression links (plus approximate relation to Victorian Curriculum F–10 Mathematics levels) |
| **Geography Levels 7 and 8**Factors that influence the decisions people make about where to live and their perceptions of the liveability of places [(VCGGK111)](https://victoriancurriculum.vcaa.vic.edu.au/Curriculum/ContentDescription/VCGGK111)Influence of accessibility to services and facilities; and environmental quality, on the liveability of places [(VCGGK112)](https://victoriancurriculum.vcaa.vic.edu.au/Curriculum/ContentDescription/VCGGK112)Environmental, economic and social measures used to evaluate places for their liveability, comparing two different places [(VCGGK113)](https://victoriancurriculum.vcaa.vic.edu.au/Curriculum/ContentDescription/VCGGK113)Influence of social connectedness and community identity on the liveability of places [(VCGGK114)](https://victoriancurriculum.vcaa.vic.edu.au/Curriculum/ContentDescription/VCGGK114)Strategies used to enhance the liveability of places, especially for young people, including examples from Australia and Europe [(VCGGK115)](https://victoriancurriculum.vcaa.vic.edu.au/Curriculum/ContentDescription/VCGGK115) | **Operating with percentages*** Understanding percentages and relative size (6)

**Positioning and locating*** Using formal maps and plans (3)
* Interpreting maps and plans (4–5)

**Interpreting and representing data*** Collecting and displaying data (4–5)
* Shape of data displays (7)
 |
| **Numeracy in context – Geography, Levels 7 and 8** |
| **Operating with percentages**Students collect quantitative evidence when investigating geographical statistics and data. They understand percentage as a part of a whole and use percentage to compare relative size.**Positioning and locating**When investigating facilities, amenities, geomorphology and water access around the world, students read and interpret formal maps using grid references and a key, recognising landmarks and position. **Interpreting and representing data**Students collect information about available facilities in and services between different forms of settlements in a range of locations in Australia and other countries. They view statistics involving the importance of transportation and liveability in locations around the world. Students interpret and represent data using one-to-one graphical displays, including tables, histograms and stacked dot plots. |

Landforms and landscapes

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| Relevant Victorian Curriculum content descriptions | Numeracy Learning Progression links (plus approximate relation to Victorian Curriculum F–10 Mathematics levels) |
| **Geography Levels 7 and 8**Different types of landscapes and their distinctive landform features [(VCGGK116)](https://victoriancurriculum.vcaa.vic.edu.au/Curriculum/ContentDescription/VCGGK116)Geomorphic processes that produce landforms, including a case study of at least one landform [(VCGGK117)](https://victoriancurriculum.vcaa.vic.edu.au/Curriculum/ContentDescription/VCGGK117)The differences in at least one landform in Australia compared to other places and the geomorphic processes involved [(VCGGK118)](https://victoriancurriculum.vcaa.vic.edu.au/Curriculum/ContentDescription/VCGGK118)Human causes of landscape degradation, the effects on landscape quality and the implications for places [(VCGGK119)](https://victoriancurriculum.vcaa.vic.edu.au/Curriculum/ContentDescription/VCGGK119)Spiritual, cultural and aesthetic value of landscapes and landforms for people, including Aboriginal and Torres Strait Islander peoples, that influence the significance of places, and ways of protecting significant landscapes [(VCGGK120)](https://victoriancurriculum.vcaa.vic.edu.au/Curriculum/ContentDescription/VCGGK120)Causes of a geomorphological hazard and its impacts on places and human responses to it to minimise harmful effects on places in the future [(VCGGK121)](https://victoriancurriculum.vcaa.vic.edu.au/Curriculum/ContentDescription/VCGGK121) | **Operating with percentages*** Understanding percentages and relative size (6)

**Positioning and locating*** Using formal maps and plans (3)
* Interpreting maps and plans (4–5)

**Understanding units of measurement*** Using formal units (3–5)
* Converting units (6–7)
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| **Numeracy in context – Geography, Levels 7–10** |
| **Operating with percentages**Students analyse the effects of erosion and sedimentation that result from human activity, as well as the effects of river regulations and the impacts these regulations have on landscapes. Students represent relative sizes in percentages and use these to describe an outcome or impact, for example when reviewing land degradation and quantifying impacts on landforms. **Positioning and locating**Students investigate different landforms and landscapes, including coastal, riverine, arid, mountain and karst, using examples from around the world. They use features of a map, including a key and grid reference system.**Understanding units of measurement**Students explore different types of landscapes and their landform features, and they use units of measurement such as metres (m) and kilometres (km) to determine size. |

Changing nations

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| Relevant Victorian Curriculum content descriptions | Numeracy Learning Progression links (plus approximate relation to Victorian Curriculum F–10 Mathematics levels) |
| **Geography Levels 7 and 8**The causes and consequences of urbanisation, drawing on a study from Indonesia [(VCGGK122)](https://victoriancurriculum.vcaa.vic.edu.au/Curriculum/ContentDescription/VCGGK122)The causes and consequences of urban concentration and urban settlement patterns between Australia and the United States of America and reasons for these similarities and differences [(VCGGK123)](https://victoriancurriculum.vcaa.vic.edu.au/Curriculum/ContentDescription/VCGGK123)The reasons for and effects of international migration to Australia [(VCGGK124)](https://victoriancurriculum.vcaa.vic.edu.au/Curriculum/ContentDescription/VCGGK124)The reasons for and effects of internal migration in Australia and China [(VCGGK125)](https://victoriancurriculum.vcaa.vic.edu.au/Curriculum/ContentDescription/VCGGK125)The challenges of managing and planning Australia’s urban future [(VCGGK126)](https://victoriancurriculum.vcaa.vic.edu.au/Curriculum/ContentDescription/VCGGK126) | **Quantifying numbers*** Understanding place value (3–6)
* Representing place value (6)

**Positioning and locating*** Using formal maps and plans (3)
* Interpreting maps and plans (4–5)

**Measuring time*** Relating units of time (4–5)
* Time zones (6–8)

**Interpreting and representing data*** Collecting and displaying data (4–5)
 |
| **Numeracy in context – Geography, Levels 7–10** |
| **Quantifying numbers**Students read and write numbers, applying knowledge of the place value periods of ones, tens, hundreds, thousands and millions when investigating numbers associated with statistics in the sub-strand Changing nations. Students apply knowledge of place value to determine chronological order and sequencing of events when investigating international migration. **Positioning and locating**Students investigate international migration and use features of a map, including a key and grid reference system.**Measuring time**Students investigate the relationship between year, decade, century and millennium and give examples of when these units are used to quantify durations of significant geographical change.**Interpreting and representing data**Students represent and interpret data on migration and justify their selection of data collection methods to suit the context. They determine the most accurate statistic to describe the data (for example, for the year ending 30 June 2019, just under 30% of Australia’s resident population were born overseas[[1]](#footnote-1)) and read and interpret data from tables representing population and migration statistics over a period of time. |

Links to Geographical Knowledge, Levels 9 and 10

Achievement standard, Levels 9 and 10

By the end of Level 10, students predict changes in the characteristics of places over time and identify implications of change for the future. They identify, analyse, and explain significant spatial distributions and patterns and significant interconnections within and between places, and identify and evaluate their implications, over time and at different scales.

They evaluate alternative views on a geographical challenge and alternative strategies to address this challenge, using environmental, social and economic criteria, explaining the predicted outcomes and further consequences and drawing a reasoned conclusion.

They ethically collect relevant geographical data and information from reliable and useful sources. They select, organise and represent data and information in different forms, using appropriate digital and spatial technologies and through special purpose maps that conform to cartographic conventions. They analyse and evaluate geographical data, maps and information using digital and spatial technologies and Geographical Information Systems as appropriate to develop identifications, descriptions, explanations and conclusions that use geographical terminology.

Biomes and food security

| Relevant Victorian Curriculum content descriptions | Numeracy Learning Progression links (plus approximate relation to Victorian Curriculum F–10 Mathematics levels) |
| --- | --- |
| **Geography Levels 9 and 10**Distribution and characteristics of biomes as regions with distinctive climates, soils, vegetation and productivity [(VCGGK133)](https://victoriancurriculum.vcaa.vic.edu.au/Curriculum/ContentDescription/VCGGK133)Environmental, economic and technological factors that influence crop yields in Australia and across the world [(VCGGK134)](https://victoriancurriculum.vcaa.vic.edu.au/Curriculum/ContentDescription/VCGGK134)The interconnection between food production and land and water degradation; shortage of fresh water; competing land uses; and climate change, for Australia and other areas of the world [(VCGGK135)](https://victoriancurriculum.vcaa.vic.edu.au/Curriculum/ContentDescription/VCGGK135)Human alteration of biomes to produce food, industrial materials and fibres, and the environmental effects of these alterations [(VCGGK136)](https://victoriancurriculum.vcaa.vic.edu.au/Curriculum/ContentDescription/VCGGK136)Land and resource management strategies used by Aboriginal or Torres Strait Islander peoples to achieve food security over time [(VCGGK137)](https://victoriancurriculum.vcaa.vic.edu.au/Curriculum/ContentDescription/VCGGK137)Challenges in feeding the current and projected populations of Australia and the world, and responses to these challenges [(VCGGK138)](https://victoriancurriculum.vcaa.vic.edu.au/Curriculum/ContentDescription/VCGGK138) | **Comparing units*** Ratios (8)
* Rates (8)
* Applying proportion (9)

**Operating with percentages*** Understanding percentages and relative size (6)

**Positioning and locating*** Using formal maps and plans (3)
* Interpreting maps and plans (4–5)

**Interpreting and representing data*** Collecting and displaying data (4–5)
* Graphical representations of data (8)
 |
| **Numeracy in context – Geography, Levels 7–10** |
| **Comparing units**Students investigate the importance of pH levels and temperatures in biomes in regard to the vulnerability of coral. They investigate how coral ecosystems are impacted if this ratio is changed. They examine the spatial and seasonal quantity of soil moisture available for agriculture when exploring influential factors on crop yields. Students explain the difference between direct and indirect proportion and apply their understanding (for example, direct – increase in the global population and demand for food; indirect – increase in salinity and decrease in crop yields).**Operating with percentages**Students understand percentage as relative size and use their understanding to describe characteristics in biomes and food security, such as that marine biomes cover approximately 70% of Earth. They apply knowledge of percentages to discuss impacts and effects, including losses, of climate change. **Positioning and locating**Students investigate characteristics of biomes in Australia and in the world. They interpret the scale used as ratio on plans and maps and identify key features and locations using directional language. **Interpreting and representing data**Students construct and interpret tables that classify and describe key characteristics of different types of biomes. They use graphical representations relevant to the purpose of the collection of the data and, through their study of growth charts, temperature charts and population statistics, recognise that continuous variables depicting growth or change often vary over time. |

Geographies of interconnection

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| Relevant Victorian Curriculum content descriptions | Numeracy Learning Progression links (plus approximate relation to Victorian Curriculum F–10 Mathematics levels) |
| **Geography Levels 9 and 10**Perceptions people have of place, and how this influences their connections to different places [(VCGGK139)](https://victoriancurriculum.vcaa.vic.edu.au/Curriculum/ContentDescription/VCGGK139)Ways in which transportation and information and communication technologies are used to connect people to services, information and people in other places [(VCGGK140)](https://victoriancurriculum.vcaa.vic.edu.au/Curriculum/ContentDescription/VCGGK140)Ways that places and people are interconnected with other places through trade in goods and services, at all scales [(VCGGK141)](https://victoriancurriculum.vcaa.vic.edu.au/Curriculum/ContentDescription/VCGGK141)Effects of the production and consumption of goods on places and environments throughout the world and including a country from North-East Asia [(VCGGK142)](https://victoriancurriculum.vcaa.vic.edu.au/Curriculum/ContentDescription/VCGGK142)Effects of people’s travel, recreational, cultural or leisure choices on places, and the implications for the future of these places [(VCGGK143)](https://victoriancurriculum.vcaa.vic.edu.au/Curriculum/ContentDescription/VCGGK143) | **Operating with percentages*** Understanding percentages and relative size (6)

**Positioning and locating*** Using formal maps and plans (3)
* Interpreting maps and plans (4–5)

**Interpreting and representing data** * Collecting and displaying data (4–5)
* Graphical representations of data (8)
 |
| **Numeracy in context – Geography, Levels 7–10** |
| **Operating with percentages**Students understand percentage as relative size and use their understanding to describe statistics, such as 59% of people around the world have access to the internet. **Positioning and locating**Students investigate influences on connections around Australia and the world. They interpret the scale used as ratio on plans and maps and identify key features and locations using directional language.**Interpreting and representing data** Students collect and interpret data on which transportation and information and communications technologies are used to connect people to services, such as in rural and remote places in Australia. They interpret data tables, and determine and calculate the most appropriate statistic to describe the data. |

Environmental change and management

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| Relevant Victorian Curriculum content descriptions | Numeracy Learning Progression links (plus approximate relation to Victorian Curriculum F–10 Mathematics levels) |
| **Geography Levels 9 and 10**Different types and distribution of environmental changes and the forms it takes in different places [(VCGGK144)](https://victoriancurriculum.vcaa.vic.edu.au/Curriculum/ContentDescription/VCGGK144)Environmental, economic and technological factors that influence environmental change and human responses to its management [(VCGGK145)](https://victoriancurriculum.vcaa.vic.edu.au/Curriculum/ContentDescription/VCGGK145)Environmental worldviews of people and their implications for environmental management [(VCGGK146)](https://victoriancurriculum.vcaa.vic.edu.au/Curriculum/ContentDescription/VCGGK146)Causes and consequences of an environmental change, comparing examples from Australia and at least one other country [(VCGGK147)](https://victoriancurriculum.vcaa.vic.edu.au/Curriculum/ContentDescription/VCGGK147)Aboriginal and Torres Strait Islander peoples’ approaches to custodial responsibility and environmental management in different regions of Australia [(VCGGK148)](https://victoriancurriculum.vcaa.vic.edu.au/Curriculum/ContentDescription/VCGGK148)Application of environmental economic and social criteria in evaluating management responses to an environmental change, and the predicted outcomes and further consequences of management responses on the environment and places, comparing examples from Australia and at least one other country [(VCGGK149)](https://victoriancurriculum.vcaa.vic.edu.au/Curriculum/ContentDescription/VCGGK149) | **Quantifying numbers*** Understanding decimal place value (3–6)

**Positioning and locating*** Using formal maps and plans (3)
* Interpreting maps and plans (4–5)

**Interpreting and representing data*** Collecting and displaying data (4–5)
* Graphical representation of data (8)
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| **Numeracy in context – Geography, Levels 7–10** |
| **Quantifying numbers**Students read and write numbers applying knowledge of the place value periods of ones, tens, hundreds, thousands and millions when investigating numbers associated with statistics in the sub-strand Environmental change and management. Students apply knowledge of place value to determine chronological order and sequencing of events when investigating environmental change over time. **Positioning and locating**Students investigate environmental changes over time in Australia and at least one other country. They interpret the scale used as ratio on maps and identify key features and locations using directional language.**Interpreting and representing data**Students evaluate change over time through graphical representations relevant to the purpose of the collection of the data. They list and compare causes and consequences of environmental change within Australia and at least one other country. Students determine and calculate the most appropriate statistic to describe the data and recognise that continuous variables depicting growth or change often vary over time. |

Geographies of human wellbeing

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| Relevant Victorian Curriculum content descriptions | Numeracy Learning Progression links (plus approximate relation to Victorian Curriculum F–10 Mathematics levels) |
| **Geography Levels 9 and 10**Interconnecting causes of spatial variations between countries in selected indicators of human wellbeing [(VCGGK150)](https://victoriancurriculum.vcaa.vic.edu.au/Curriculum/ContentDescription/VCGGK150)Reasons and consequences for spatial variations in human wellbeing on a regional scale within India or another country of the Asia region; and on a local scale in Australia [(VCGGK151)](https://victoriancurriculum.vcaa.vic.edu.au/Curriculum/ContentDescription/VCGGK151)Different ways of measuring and mapping human wellbeing and development, and how these can be applied to measure differences between places [(VCGGK152)](https://victoriancurriculum.vcaa.vic.edu.au/Curriculum/ContentDescription/VCGGK152)Issues affecting the development of places and their impact on human wellbeing, drawing on a study from a developing country or region in Africa, South America or the Pacific Islands [(VCGGK153)](https://victoriancurriculum.vcaa.vic.edu.au/Curriculum/ContentDescription/VCGGK153)Role of initiatives by international and national government and non-government organisations to improve human wellbeing in Australia and other countries [(VCGGK154)](https://victoriancurriculum.vcaa.vic.edu.au/Curriculum/ContentDescription/VCGGK154) | **Number patterns and algebraic thinking*** Generalising patterns (4–5)

**Operating with percentages*** Adding a percentage as multiplying (9)
* Repeatedly adding a percentage (10)

**Positioning and locating*** Using formal maps and plans (3)
* Interpreting maps and plans (4–5)

**Interpreting and representing data*** Collecting and displaying data (4–5)
* Graphical representations of data (8)
 |
| **Numeracy in context – Geography, Levels 7–10** |
| **Number patterns and algebraic thinking**As geographers at this level students identify, describe and explain the interconnection between spatial variations in human wellbeing between countries and regions. They describe rules for continuing patterns and use words or symbols (including letters) to express relationships. **Operating with percentages**Students calculate percentage increase and decrease. They calculate measurable impacts surrounding wellbeing in Australia and other countries around the world, expressing these as percentages related to the collected data.**Positioning and locating**Students investigate human wellbeing in Australia and other countries around the world. They interpret the scale used as ratio on maps and identify key features and locations using directional language.**Interpreting and representing data**Students collect, interpret and represent data on variations in wellbeing in Australia and other countries around the world. They make comparisons between results and draw conclusions based on the representations of the data. |

1. Australian Bureau of Statistics (2020, October 06), [*Migration, Australia*](https://www.abs.gov.au/statistics/people/population/migration-australia/latest-release#:~:text=In%20the%20year%20to%2030,cent%20who%20were%20international%20students), Australian Bureau of Statistics, Australian Government. [↑](#footnote-ref-1)