Government of **Western Australia**
School Curriculum and Standards Authority

General Capabilities

Numeracy

Acknowledgement of Country

Kaya.
The School Curriculum and Standards Authority (the Authority) acknowledges that our offices are on Whadjuk Noongar boodjar and that we deliver our services on the country of many traditional custodians and language groups throughout Western Australia. The Authority acknowledges the traditional custodians throughout Western Australia and their continuing connection to land, waters and community.
We offer our respect to Elders past and present.

Contents

Numeracy

Image adapted from: Cumming, 2018

What is Numeracy?

Numeracy is defined as students' ability to use mathematical knowledge and skills effectively for learning and participation in daily life. Numeracy is fundamental to a student's ability to learn at school and to engage productively in society. It involves the recognition, formulation and interpretation of mathematics, and its application to real-world problems and contexts.

Through the Western Australian Curriculum, students become numerate as they develop the learning and thinking to use mathematics knowledge and skills more confidently across other learning areas at school and in their lives more broadly.

Numeracy is fundamental to a student's ability to learn at school and to engage productively in society.

How can you use the **Numeracy** learning continuum?

The Numeracy learning continuum identifies mathematical knowledge and skills and contextualises these through examples across learning areas. While much of the development 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 and subject-specific numeracy demands. These numeracy-rich situations are a part of learning across curriculum areas. Being able to use numeracy skills in a range of contexts contributes to success across learning areas. Students need opportunities to recognise that mathematics is constantly used outside the mathematics classroom, and that numerate people apply mathematical skills in a wide range of familiar and unfamiliar situations.

Using the Numeracy learning continuum assists teachers to:

- identify the specific numeracy demands of their learning area
- provide learning experiences and opportunities that support the application of students' general mathematical knowledge and skills
- correctly use mathematical language in the learning areas they are teaching.

Students demonstrate different rates of progress as they attain numeracy. The Numeracy learning continuum enables teachers to plan for the targeted teaching of numeracy, by providing age appropriate examples and materials suitable to address learning area content at the developmental stage of the student. While the levels are not intended to be achievement markers for year levels, as a guide, Levels 1–4 typically represent learning in the primary years of schooling, while Levels 5–6 describe numeracy standards typically met by students in Years 7–10 who meet the achievement standard for the year level curriculum.

The Numeracy continuum includes Level 1a. At 1a, children are developing an understanding of their world in the context of the language and/or behaviour related to number sense, patterns, measurement, shape and probability. Descriptions for 1a represent the early learning and thinking skills for numeracy, with a focus on the language of numeracy in everyday contexts which will prepare children for further progression. Children at this level explore mathematical situations and are encouraged by educators to engage in conversations that develop curiosity and knowledge focused on numeracy. Level 1 represents the numeracy skills and knowledge that subsequently develop in early childhood as children engage in higher-level thinking through less-familiar learning experiences directed by educators. Typically, Level 1a descriptions align with descriptions for Kindergarten, or for students who may need additional time or support to progress their numeracy development. Level 1 aligns with descriptions for learning that are likely to occur for most students during Pre-primary.

Organising elements

The Numeracy learning continuum is organised into six interrelated elements:

- Understanding and calculating with whole numbers
- Recognising and using patterns and algebraic relationships
- Using fractions, decimals, percentages, ratios and rates
- Using spatial reasoning
- Interpreting statistical information
- Using measurement.

The diagram below sets out these elements.

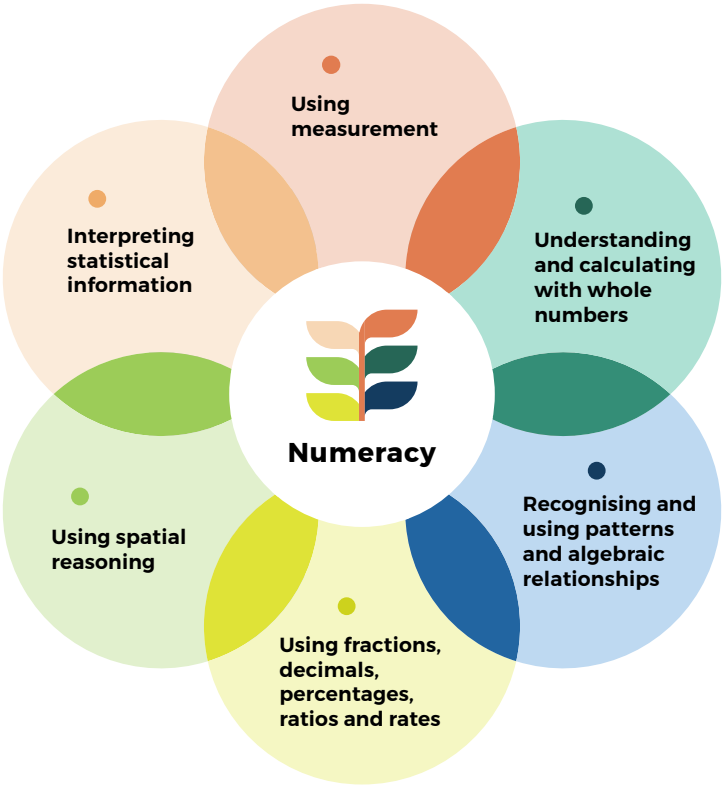


Figure 1:
Organising elements of Numeracy diagram

Understanding and calculating with whole numbers

This element involves students using whole numbers for different purposes. Students apply skills in estimating and calculating with whole numbers to solve and model everyday problems in a wide range of authentic contexts using efficient mental, written and digital strategies, recognising when an exact or approximate solution is required. They identify situations where money is used and apply their knowledge of the value of money to purchasing, budgeting and justifying the use of money. To develop numeracy, students:

- understand and use numbers in context
- estimate and calculate
- use money.

Recognising and using patterns and algebraic relationships

This element describes how students become increasingly able to identify and describe repeating and growing patterns in the environment and other everyday contexts. Students develop the capacity to generalise as they learn to recognise, represent, describe and use patterns for prediction and decision making. To develop numeracy, students:

- recognise and use patterns and algebraic relationships.

Using fractions, decimals, percentages, ratios and rates

This element involves students developing an understanding of multiplicative thinking and how it relates to fractions and decimals as parts of a whole. Students learn how fractions and decimals can be shown as ratios, rates and percentages and how these ideas are used in real-life situations. They visualise, order and describe shapes and objects to understand fractions and ratios and to see how proportions work in scale using enlargement and reduction. Students use the relationships of ratios, rates and percentages to solve problems in authentic contexts. To develop numeracy, students:

- interpret proportional reasoning
- apply proportional reasoning.

Using spatial reasoning

This element involves students making sense of the space around them. Students visualise, identify and sort shapes and objects, describing their key features in the environment. They use symmetry, shapes and angles to solve problems in authentic contexts. Students interpret maps and diagrams using scales, legends and directional language to identify and describe routes and locations. They learn to visualise and orientate objects to solve problems in spatial contexts.
To develop numeracy, students:

- visualise 2D shapes and 3D objects
- interpret maps and diagrams.

Interpreting statistical information

This element describes how students become increasingly able to recognise, use and interpret visual and numerical displays to describe data associated with authentic statistical contexts. They develop the ability to critically evaluate statistical reports.

Students learn to compare chance events in relation to variation and expectation. They describe outcomes of chance experiments, develop an understanding of randomness and recognise bias. Students make predictions and explain why expected results may differ from the actual results of chance events.
To develop numeracy, students:

- interpret chance events
- interpret and represent data displays.

Using measurement

This element involves students learning about comparing and quantifying attributes of measurement, such as length, area, volume, capacity, time, angles and mass. They initially use direct comparison to recognise and understand what it means to have more or less of a particular attribute, then progress from using informal units to standard units. Students estimate, measure, compare and calculate using metric units when solving problems in authentic contexts, recognising whether an exact or approximate solution is required. They read clocks, convert between time systems and time zones, identify and sequence dates and events using a calendar, and use timetables for a variety of purposes.
To develop numeracy, students:

- estimate and measure with metric units
- operate with clocks, calendars and timetables.

learning continuum

Understanding and calculating with whole numbers

Table 1

Student levels	Understand and use numbers in context: Descriptions	Examples
L1a	Demonstrate concepts of counting using everyday experiences	• Stating that something will happen on the count of one, two, three
L1	Say, read and write number names, numerals and collections up to 20	• Counting out the number of paintbrushes needed for a group of six classmates • Collecting and then giving out five beanbags for a game
L2	Read, write, order and use numbers up to four digits	• Estimating the growth of a plant and representing their prediction by making a chart • Representing dates on a number line showing their own lifespan
L3	Read, write, order and use numbers up to six digits	• Estimating the distance in kilometres from Perth to Canberra • Representing the number of kilograms of material processed by a local recycling plant each day • Reading scales to mm, g and mL when measuring amounts for an experiment, and recording these on graphs
L4	Read, write, order and use seven-digit numbers and beyond	• Ordering countries or states by population • Researching and recording the populations of native animals
L5	Compare, order and use positive and negative numbers to solve everyday problems	• Recording different boiling and freezing points in an experiment
L6	Use different ways to represent very large and very small numbers, including scientific notation	• Exploring instruments used to measure very large and very small measures • Reading that the world population is estimated to be seven billion and interpreting this to mean 7 000 000 000 or 7×10^9

Table 2

Estimate and calculate

Student levels	Descriptions	Examples
L1a	Recognise the effects of adding to and taking away from a collection of objects with concrete materials	• When listening to a nursery rhyme or story, saying whether a collection is getting bigger or smaller when the action of taking away or adding is discussed; for example, 'five little ducks' • When sharing fruit, indicating whether there is more or less fruit after everyone has eaten some
L1	Solve everyday addition and subtraction stories	• Demonstrating understanding that there is one less button on a shirt when a button has been lost • Setting up a pretend duck pond, demonstrating animals leaving and arriving and discussing the difference
L2	Estimate the solution to an addition or subtraction problem and then calculate the answer	• Estimating how many wheels are on ten bikes • Estimating how much change will be left from $10 if three $2 cupcakes are purchased
L3	Estimate the solution to a problem and then check the solution by recalling additive and multiplicative facts	• Estimating how many metres they will run if they complete five laps of a 200 m oval
L4	Estimate the solution to a problem and check calculations using efficient multiplicative mental and written strategies	• Estimating whether $30 will be enough to buy six mugs at $4.95 each by rounding to $5 • Estimating how many muffin trays will be needed to bake 120 muffins for a school fundraiser
L5	Solve complex problems by estimating and calculating using efficient mental, written and digital strategies	• Using a rate of application to determine the amount of paint required to cover a large area and determining how many tins of paint are required • Using the rate of deforestation to determine how much forest within a region will remain after 15 years
L6	Solve and model problems involving complex data by estimating and calculating using a variety of efficient mental, written and digital strategies	• Designing and conducting an experiment that uses submersion to determine the volume of an object • Estimating population size in a local ecosystem using sampling techniques • Using current rates of deforestation to model how much forest will remain over time on a global scale

Table 3

Use money

Student levels	Descriptions	Examples
L1a	Explore situations that involve the use of money	• Using pictures of the local community to describe places where payment methods can be used • Using payment methods in a play-based shopping context or to pay for a bus ticket when role-playing catching the bus
L1	Explore different forms of payment	• Sorting and choosing between different coins, notes and cards to pay for items in role-play • Purchasing items at a school fundraiser with coins or notes • Using tokens and vouchers to pay for various things at fairs and playgrounds
L2	Identify and use combinations of coins and notes for simple purchases in spending, saving and donating contexts	• Selecting the right money when role-playing buying lunch from the school canteen • Recognising that $3 can be made up of $2 + $1, $1 + 50c + 50c + 50c + 50c or the change from a $5 note when spending $2
L3	Explore saving and spending, recognising that limited amounts of money are available	• Choosing a savings goal, such as saving for a toy or game • Planning a simple recipe, adding up the cost of the ingredients and deciding what they can afford to buy
L4	Create simple financial plans, budgets and cost predictions	• Determining how long it will take to save for a bike, based on the amount of pocket money received each week • Using a spreadsheet to estimate the costs associated with an end-of-year camp; keeping track of money raised and determining the amount each student must pay
L5	Explore how different payment methods affect purchasing decisions	• Identifying interest payments on transactional statements • Writing a persuasive text arguing that modern payment methods make people less/more responsible with their money • Determining penalties for not adhering to the terms of credit of ‘buy now, pay later’ schemes
L6	Explain and perform calculations that relate to earning income	• Comparing the average income in different countries • Estimating how much money a part-time or casual coach would earn by calculating hourly pay, overtime, travel expenses and the number of hours worked each week • Explain why and how individuals manage financial investment risks and rewards in different types of investments, such as shares, real estate and superannuation

Recognising and using patterns and algebraic thinking

Table 4

Recognise and use patterns and algebraic relationships

Student levels	Descriptions	Examples
L1a	Recognise simple patterns in everyday contexts	• Recognising patterns in nature, music and artwork • Using everyday language to describe patterns when playing with blocks, beads and toys
L1	Copy and continue patterns using a range of materials, sounds and movements	• Continuing and creating simple patterns using different colours or shapes through weaving, beading or building • Repeating patterns in music, movement and dance
L2	Continue repeating patterns, with increasing or decreasing additive core elements	• Using a simple programming tool to create a program where a character moves in an increasing or decreasing pattern • Recognising an increasing pattern when observing growth patterns in plants
L3	Create and represent increasing multiplicative patterns and describe rules to represent the pattern	• Exploring the pattern of how distance changes with speed over time • Recognising and creating a pattern of doubling circles when creating a mandala
L4	Identify and describe pattern rules and relationships that help to identify trends	• Tracking different variables (e.g. hours of sleep, type or intensity of exercise) and assessing how these affect their performance in a specific physical task, like running or lifting weights
L5	Identify trends using number rules and relationships	• Recording their heart rate after different intervals of exercise and noticing that it increases by a predictable amount and levels off, then using the trend to understand recovery time
L6	Explain how the practical application of patterns can be used to identify trends	• Analysing long-term climate patterns and trends, including temperature changes and their correlation to geographical factors • Analysing data to describe patterns and relationships, such as the direction of growth of plant shoots and roots or the change in the acceleration of an object in relation to a change in ramp steepness

Using fractions, decimals, percentages, ratios and rates

Table 5

Student levels	Interpret proportional reasoning: Descriptions	Examples
L1a	Recognise ‘a whole’ and ‘parts of a whole’ in everyday contexts	• When sharing a cake, describing how the whole is different to the slices • When completing a puzzle, recognising that the parts make up the whole of the puzzle
L1	Explore grouping and sharing of small collections, recognising that a whole can be divided into equal parts	• Counting a small collection in two groups, knowing that both groups combine to equal the whole • Role-playing equal sharing by distributing objects one by one to all group members
L2	Visualise, recognise, describe and create halves, quarters and eighths	• Cutting an item of food in half and then half again and half again, and naming each fraction • Creating eight equal rectangles by folding paper in half, half again and half again, describing the action of each fold
L3	Visualise, describe and represent common equivalent fractions and make connections to their decimal representation	• Measuring and mixing solutions, reading instructions in decimals and then measuring using a jug labelled in fractions • Reading a recipe or healthy eating plan and connecting a half, a quarter and one tenth with their decimal representations
L4	Visualise, describe and represent equivalent fractions, decimals and simple percentages	• Explaining how to make a drink using water, lemonade and fruit juice using equivalent fractions and percentages
L5	Visualise and describe the proportions of percentages, ratios and rates	• Explaining the sizes of different cultural groups as proportions of the population of the local community • Discussing how paint colour mixing can be represented as ratios • Identifying 30 km/h as a rate, interpreting it as 30 km travelled in every one-hour period, and reasoning that this means that 60 km will be travelled in two hours • Measuring the body’s response to physical activity, such as heart rate
L6	Illustrate and order relationships for fractions, decimals, percentages, ratios and rates	• Expressing the concentration of a solution as a ratio, a fraction and a percentage (e.g. salt solution 1 g in 100 mL = 1:100 = 0.01 = 1%) • Converting between ratios and percentages when analysing scale drawings (e.g. 1:200 scale = 0.5% of actual size)

Table 6

Apply proportional reasoning

Student levels	Descriptions	Examples
	Level 1 is the starting point for this sub-element	
L1	Identify quantities such as more, less and the same in everyday comparisons	• Pouring an equal amount of liquid into two containers or identifying that one storage container holds more than another • Comparing and describing small collections using the terms 'more', 'less' and 'same'
L2	Solve problems using halves, quarters and eighths	• Using kitchen measuring equipment to show that two half-cup measures can be used instead of a one-cup measure • Creating a mosaic pattern by creating and rearranging halves, quarters and eighths of the same shape
L3	Solve problems using equivalent fractions for $\frac{1}{2}, \frac{1}{3}, \frac{1}{4}, \frac{1}{5}, \frac{1}{10}$ and $\frac{1}{100}$ and related decimals	• Finding the time difference between the fastest and slowest times for a class beep test • Converting and comparing measurements of ingredients, converting measures to millilitres (mL)
L4	Solve problems using equivalent fractions, decimals and simple percentages	• Connecting commonly used percentages, including 10%, 25% and 50%, to fractions and decimals (e.g. recognising that '50% off' is half price)
L5	Solve problems using simple percentages, ratios and rates	• Using proportional reasoning to adjust a recipe that serves 12 people to serve 18 people • Calculating each student's costs for an excursion in a given ratio, such as dividing $570 in the ratio of 2:1 • Calculating percentage increase or decrease in international migration in Australia, expressing the answer as an approximate value • Investigating how long it took people to travel between locations using different transport methods at different times in history
L6	Solve problems involving fractions, decimals, percentages, ratios and rates	• Tracking progress in fitness using ratios, percentages and fractions to evaluate improvements • Determining the width of a bookcase using the scale or ratio on its construction plan or determining the actual radius of a cell, given a diagram with a scale • Investigating how the rate at which a chemical reaction occurs can be altered by changing factors, including temperature, concentration and the surface area of a reactant

Using spatial reasoning

Table 7

Visualise 2D shapes and 3D objects

Student levels	Descriptions	Examples
L1a	Sort or match objects according to their features	• Sorting and describing objects by features of shape, size, and function using everyday language • Exploring stacking, rolling and spinning a range of objects in the construction area
L1	Sort and name common 2D shapes and 3D objects	• Grouping 2D shapes and 3D objects by their features • Conducting shape and object hunts around the school • Noticing similarities in the shapes of familiar things, e.g. 'It looks like a ball' • Using natural and classroom materials, sorting shapes and objects to build places on country
L2	Identify, manipulate, sort and describe common 2D shapes and 3D objects	• Creating a structure using a variety of shapes • Exploring how different 3D objects move if pushed, based on the features of the objects
L3	Explore, visualise, describe and create 2D shapes and connect the features to 3D objects, including visualising key features that cannot be seen	• Planning, building and describing a structure that has a purpose, using 3D objects • Rearranging and combining shape pieces to make another specified shape in art (tangrams)
L4	Identify line and rotational symmetry and describe transformations of 2D shapes	• Identifying line symmetry in the environment, artworks and patterns, such as in logos • Transforming shapes to create tessellating patterns
L5	Visualise, describe, and apply understanding of the features and properties of 2D shapes and 3D objects	• Exploring how shapes are used in graphic design, logo design or modern architecture, and describing how shapes and objects are used for visual impact or function
L6	Visualise, describe and analyse the way shapes and objects are combined and positioned in the environment for different purposes	• Exploring how the arrangement of particles in materials like metals or polymers impacts their strength, flexibility and other physical properties • Exploring how artists or architects use combinations of geometric shapes to influence the appearance and function of artworks or spaces

Table 8

Interpret maps and diagrams

Student levels	Descriptions	Examples
L1a	Demonstrate awareness of the position of themself and objects in everyday contexts	• Following actions to perform a song or dance • Describing what they are doing when playing on an obstacle course: going under or over, around or through
L1	Give and follow directions to demonstrate understanding of common positional and movement language in familiar environments	• Describing the route to a familiar location as a sequence of steps to be followed • Using the language of position and movement to describe the actions of a story character
L2	Locate positions and pathways on maps of familiar locations using the language of quarter, half and full turns	• Using the language of position and movement to direct a friend to a new location • Following a simple route on a map using landmarks and directional language • Representing a significant local site using a map to record landmarks and pathways
L3	Create and interpret simple grid maps describing positions and pathways, considering key features, scale and legends	• Creating, labelling and identifying features on maps of Africa or locating other countries in relation to Australia • Creating and interpreting a grid map showing the journey of a world navigator
L4	Identify and describe positions and pathways using grid reference systems and directional language such as north or north-east	• Using a street map to describe how to locate and plan a route to a friend's house • Using a Cartesian plane and coordinate system to create a pathway for a robot to follow
L5	Create and interpret 2D maps and diagrams and 3D models	• Using digital tools to create interactive historical maps that track the movement of people, goods or ideas over time • Identifying spatial distributions from map data, such as how food outlets are distributed within a shopping centre
L6	Create and interpret maps, models and diagrams using a range of mapping tools	• Designing a product and creating a blueprint or 3D model using CAD software, and analysing how different dimensions affect the overall function or appearance of the design

Interpreting statistical information

Table 9

Student levels	Interpret chance events: Descriptions	Interpret chance events: Examples
L1a	Use everyday language to state opinions on the possibility of an event or outcome happening	• Using the language of chance in everyday incidental conversations and giving reasons when responding to questions such as, 'Will night follow day?', 'Will we eat breakfast at school today?', 'Will it rain today?', 'Will a unicorn be in the playground at lunch?'
L1	Recognise that some events might or might not happen, using everyday language of chance	• Describing the possibility of a familiar weather event, such as rain, when observing the appearance of the sky • Describing the chance that an event might occur when reading a familiar story
L2	Classify familiar events involving chance as possible or impossible, using everyday language of chance	• Using everyday language of chance to predict the likelihood of natural events, e.g. is it more likely that the ocean, puddle, dam or river will evaporate? • Writing a story about impossible events
L3	Describe and order possible outcomes from chance experiments using the language of chance and recognising variation in results	• Understanding and using terms denoting the likelihood of events, including colloquial terms such as 'no way' and 'for sure'
L4	Compare a range of everyday chance events, including those that are not equally likely, using numerical representations (fractions, decimals and percentages)	• Comparing expected average rainfall/temperature for a month with actual daily data from the local area
L5	Describe and explain why the actual results of chance events are not always the same as expected results	• Dropping a ball and measuring bounce height, then explaining the factors that can cause results to differ
L6	Explain the likelihood of multiple events occurring together	• Simulating genetic inheritance using Punnett squares to calculate the probability of a child inheriting a combination of traits, like brown eyes and blonde hair, from two parents

Table 10

Interpret data displays

Student levels	Descriptions	Examples
L1a	Display information using real objects and respond to questions about the information displayed	• Using a picture graph of all children in the class to answer the question, 'How many children are wearing red shirts?' • Placing coloured beads in rows to represent each student's favourite colour and using this to determine the most and least popular colours
L1	Make inferences and answer simple data questions by interpreting data in drawings or picture graphs	• Asking class members which football team they support and recording this information using the team logos • Sorting a collection of leaves from the school grounds to create a visual display and interpreting the display to answer questions
L2	Choose and answer questions of interest by collecting, comparing and displaying catergorical data as tallies, lists, tables and one-to-one block or picture graphs	• Constructing column graphs and picture graphs to represent the amount of water wasted by a dripping tap over a week • Creating a one-to-one block graph to compare how students travelled to school that day, and answering questions about the data
L3	Collect, record and display data as tables, diagrams, picture graphs and column graphs Describe and interpret real life data represented in many-to-one data displays, such as dot plots, column graphs and pictographs	• Presenting information about the foods eaten by animals in a column graph • Creating a many-to-one pictograph representing the place of birth of all students in the year group
L4	Describe and interpret real-life continuous data presented in a range of displays including line graphs and side-by-side column graphs	• Comparing and discussing line graphs showing pulse rates when at rest and after activity • Describing how features of real-life data displays may influence an audience
L5	Compare, interpret and assess the effectiveness of different data displays of the same information	• Using a display of secondary data to investigate changes in the mean and median rainfall and water consumption in different locations • Comparing data displays and recognising that some provide detailed information about data points while others provide a clear picture of the mode, shape, spread and outliers of the distribution
L6	Evaluate statistics and trends reported in the media by linking claims to data displays, statistics and representative data	• Writing an opinion piece using claims that are backed by verifiable statistics and data from reputable sources • Critically evaluate information and/or data and ideas from a range of sources related to economic activity to make generalisations and inferences about performance, propose explanations for patterns and anomalies and predict outcomes

Using measurement

Table 11

Estimate and measure with metric units

Student levels	Descriptions	Examples
L1a	Use actions and/or appropriate language of measurement to describe length, temperature, mass, capacity and area in familiar environments using arbitrary tools	• Using hand gestures to describe the length of an object • Hefting an object and using everyday language of measurement to identify it as heavy or light
L1	Measure by directly comparing objects and indicate whether the measurements are the same or different using comparative language associated with the attribute	• Directly comparing the length of two objects and indicating which one is longer • Hefting two objects to say which is heaviest or lightest • Compare shopping bags to determine which one holds the most
L2	Estimate, measure and order objects using direct and indirect comparisons and informal units; communicate using language associated with the attribute	• Comparing the mass of objects using a balance scale • Measuring the length of a doorway and a desk using uniform informal units, noticing gaps and overlaps
L3	Explore, measure and compare the length, capacity and mass of everyday objects using metric units and scaled instruments	• Using a measuring jug with a calibrated scale to measure an amount to the nearest millilitre • Selecting an appropriate scaled instrument such as a tape measure or trundle wheel to measure the boundary of a garden bed
L4	Choose and use appropriate metric units for length, area, capacity and mass to solve everyday problems; convert between units of length	• Conducting a ‘measurement Olympics’ with activities such as long jump, paper plane throws, water carrying race and object lift • Converting between millilitres (mL) and litres (L) when scaling a recipe
L5	Convert between common metric units for volume and capacity and use perimeter, area and volume formulae to solve authentic problems	• Estimating and working out the area of a vegetable garden in square metres and calculating how much sugarcane mulch to buy to cover it
L6	Solve complex problems involving surface area and volume of prisms, cylinders and composite solids	• Calculating and identifying the impact of rounding and measurement errors on the outcome of results in construction

Table 12

Operate with clocks, calendars and timetables

Student levels	Descriptions	Examples
L1a	Describe the sequence of familiar events and routines using the everyday language of time	• Associating familiar activities with times of the day using pictorial or digital formats • Discussing an excursion using language such as 'tomorrow' or 'in one more sleep'
L1	Sequence days of the week and familiar daily routine events using the everyday language of time	• Retelling a familiar story or sorting pictures from a familiar event into time order • Talking about timing of familiar school events, e.g. 'Library day is Friday' and 'That is two days away'
L2	Read digital and analogue clocks to the whole, half and quarter hour, sequence events by months and seasons and identify durations between dates on a calendar	• Identifying that library day at school happens every week on the same day and that there are seven days between library days
L3	Read digital and analogue clocks to the minute, convert between hours and minutes, use 'am' and 'pm', and use calendars to locate and compare time events	• Using a clock to determine how long it is until the end of the school day
L4	Convert between 12- and 24-hour time systems to determine duration of events and journeys	• Working out how long it would take to travel from Perth to Broome
L5	Interpret representations of national and international time zones using 12- and 24-hour time and determine duration of events across multiple time zones	• Recording the correct time when creating a new event for a social media website when participants are across different time zones
L6	Interpret representations of national and international time zones using 12- and 24-hour time and determine duration of events across multiple time zones	• Scheduling a virtual meeting for global team members in various parts of the world

Glossary

A

additive

A situation or relationship that involves addition, subtraction or both.

analogue clock

A clock with hours marked from 1 to 12 arranged in a circle and moving hands to show the time.

angle

Formed by two straight lines meeting at a common endpoint, called the vertex. An angle can describe the measure of turn between its two arms (lines).

area

The amount of interior space bounded by the perimeter of a shape.

attribute

A quality, feature or characteristic of an object or figure.

B

bias (statistics)

A systematic favouring of certain outcomes more than others, due to unfair influence (knowingly or otherwise).

C

capacity

A term used to describe how much a container will hold. It is often used in relation to fluids. The benchmark unit of capacity is litres.

categorical data

Data that is grouped into discrete categories which describe a quality or characteristic of something which is not numerically measured; for example, shoe size or hair colour.

chance experiment (trial)

A process that involves planning and conducting a repeatable experiment involving chance where more than one possible outcome may occur. Experiments can be single or multi-step and results can vary across trials.

column graph

A graph for organising and displaying categorical data. Equal-width rectangular bars are constructed for each category with height equal to the observed frequency of the category.

concrete materials

Physical, tangible objects that can be manipulated to represent and explore mathematical concepts; for example, counters, blocks, dominoes, tens frames or natural objects (shells, gumnuts, rocks).

construct

To draw, make, build or digitally create a mathematical object such as a figure, pattern, algorithm or proof.

continuous variable

A numerical variable that can take any value that lies within an interval. In practice, the values taken are recorded to the accuracy of measurement of the instrument used to obtain these values.

coordinates

A set of values that define the position of a point or an object in a space. The coordinate system being used will govern the nature of the coordinates.

D

data

A set of observations or measurements. Primary data is collected by the user; secondary data is collected by others.

data displays

Visual formats for organising, representing and summarising data.

digital tools

Electronic devices, programs, websites or online resources that can be used to support the learning and practice of mathematics.

distribution (statistics)

The spread of data which can be shown graphically or in a table.

E

error

The difference between an actual value and its measured or estimated value.

estimate

To find an approximate answer to a calculation or quantity, often by rounding numbers to make them simpler.

F

fraction

A number expressed as a ratio of two whole numbers, $\frac{a}{b}$.

I

Inference (statistics)

A conclusion reached on the basis of evidence and reasoning.

informal units

Units whose values are decided on in a given context; for example, the use of a pace to measure distance (non-uniform unit) or the use of paperclips to measure length (uniform unit).

M

mass

The amount of matter in an object.

mean

The sum of values in a dataset divided by the total number of values in the dataset. One of the measures of centre (average).

median

The value in a set of ordered data that divides the data into two parts; frequently called the 'middle value'.

metric unit

A standard unit of measurement used in the metric system.

multiplicative

Problems or contexts that involve multiplication or division.

O

object

A three-dimensional solid.

outlier

A data value that appears to stand out from the other members of the dataset by being unusually high or low.

P

perimeter

The total length of the boundary of a plane figure or space.

population

The complete set of a group (for example, of individuals, objects or places) that is being studied.

prism

A three-dimensional object with two parallel, congruent faces. The other connecting faces are rectangles or parallelograms. Prisms are named after the shape of their congruent faces.

probability

The chance of something happening, shown on a scale from 0 to 1 (inclusive).

R

rate

A comparison of two quantities measured in different units; for example, the rate of distance to time, known as speed, because distance and time are measured in different units (such as kilometres and hours).

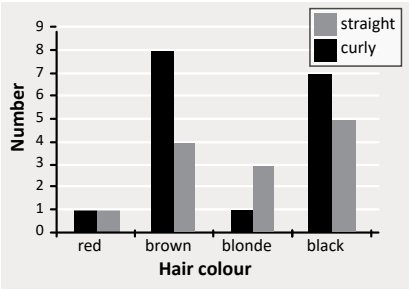
ratio

A comparison of magnitudes of sets, quantities of the same kind or algebraic expressions. It is often used as a comparison $a:b$ of the size of two (or more) quantities relative to each other.

S

side-by-side column graph

A type of column graph that can be used to organise and display the data that arises when a group of individuals or things are categorised according to two or more criteria.



spread

A statistic that indicates how widely the values of a dataset are distributed. Common measures of spread include range, interquartile range, quantiles and percentiles.

standard unit

An internationally agreed-upon, formal unit of measurement that ensures accuracy, consistency and universal understanding when measuring. For example, in the metric system, the standard units for length, mass and time are respectively metre, kilogram and second.

surface area

The measure of the total area of the faces of a three-dimensional object.

T

tessellate

To cover a surface completely with a pattern of figures without any gaps or overlaps.

time zones

The 24 divisions of the globe, where each change of 15 degrees longitude corresponds to one hour.

transformation

A change in position or size. Transformations include dilations (enlargements or compressions), reflections, rotations and translations.

U

units

The basis for counting or measurement or both; for example, the number 1 is the unit for counting and the metre is the standard unit for measurement of length in the metric system.

V

variable

Something measurable or observable that is expected to change either over time or between individual observations.

variation

The differences seen in results when an experiment is repeated or when comparing different sets of data.

volume

The amount of space occupied by an object.

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