Mathematics K–6 continuum of key ideas

Number and Algebra

Early Stage 1

Whole Numbers

Count forwards to 30 from a given number
Count backwards from a given number in the range 0 to 20
Compare, order, read and represent numbers to at least 20
Read and use the ordinal names to at least 'tenth'
Subitise small collections of objects
Use the term 'is the same as' to express equality of groups
Use the language of money

Addition and Subtraction

Combine two or more groups of objects to model addition
Take part of a group away to model subtraction
Compare two groups to determine 'how many more'
Record addition and subtraction informally

Multiplication and Division

Investigate and model equal groups
Record grouping and sharing using informal methods

Stage 1

Whole Numbers

Part 1

Count forwards and backwards by ones from a two-digit number
Partition two-digit numbers using place value
Read, write and order two-digit numbers
Read and use ordinal names to at least 'thirty-first'
Recognise, describe and order Australian coins according to their value

Part 2

Count forwards and backwards by twos, threes, fives and tens from any starting point
Partition numbers of up to three digits using place value
Read, write and order three-digit numbers
Recognise, count and order Australian coins and notes according to their value

Addition and Subtraction

Part 1

Model addition and subtraction using concrete materials
Recognise and recall combinations of numbers that add to numbers up to 20
Model and apply the commutative property for addition
Record number sentences using drawings, words, numerals and the symbols +, – and =
Use and record a range of mental strategies for addition and subtraction of one- and two-digit numbers
Use the equals sign to record equivalent number sentences

Part 2

Make connections between addition and subtraction
Use and record a range of mental strategies for addition and subtraction of two-digit numbers
Solve word problems involving addition and subtraction

Multiplication and Division

Part 1

Rhythmic and skip count by twos, fives and tens from zero
Model and use equal 'groups of' objects as a strategy for multiplication
Model division by sharing a collection equally into a given number of groups to determine the number in each group
Model division by sharing a collection equally into groups of a given size to determine the number of groups

Part 2

Model and use repeated addition as a strategy for multiplication
Model and use arrays described in terms of 'rows' and 'columns' as a strategy for multiplication
Model and use groups, arrays and repeated subtraction as strategies for division
Record using drawings, words and numerals

Stage 2

Whole Numbers

Part 1

Count forwards and backwards by tens and hundreds from any starting point
State the place value of digits in numbers of up to four digits
Read, write and order numbers of up to four digits

Part 2

State the place value of digits in numbers of up to five digits
Read, write and order numbers of up to five digits
Record numbers of up to five digits using expanded notation

Addition and Subtraction

Part 1

Model and apply the associative property for addition
Use and record a range of mental strategies for addition and subtraction of two-, three- and four-digit numbers
Perform calculations with money, including calculating equivalent amounts using different denominations
Use the equals sign to record equivalent number sentences

Part 2

Use the inverse operation to check addition and subtraction calculations
Use and record a range of mental strategies for addition and subtraction of two-, three-, four- and five-digit numbers
Use the formal written algorithm for addition and subtraction
Solve word problems, including those involving money

Multiplication and Division

Part 1

Recall multiplication facts for twos, threes, fives and tens
Recognise and use the symbols × and ÷
Link multiplication and division using arrays
Model and apply to commutative property for multiplication
Use mental strategies to multiply one-digit numbers by multiples of 10
Use and record a range of mental strategies for multiplication of two single-digit numbers

Part 2

Recall and use multiplication facts up to 10 × 10 with automaticity
Relate multiplication facts to their inverse division facts
Determine multiples and factors of whole numbers
Use the equals sign to record equivalent number relationships involving multiplication
Use and record a range of mental and informal written strategies for multiplication and division of two-digit numbers by a one-digit operator
Use mental strategies and informal recording methods for division with remainders

Stage 3

Whole Numbers

Part 1

Read, write and order numbers of any size
State the place value of digits in numbers of any size
Record numbers of any size using expanded notation
Determine factors and multiples of whole numbers

Part 2

Recognise the location of negative numbers in relation to zero on a number line
Identify and describe prime and composite numbers
Model and describe square and triangular numbers

Addition and Subtraction

Part 1

Select and apply efficient mental, written and calculator strategies for addition and subtraction of numbers of any size
Use estimation to check answers to calculations
Solve word problems and record the strategy used, including problems involving money
Create a simple budget

Part 2

Select and apply efficient mental, written and calculator strategies to solve word problems and record the strategy used

Multiplication and Division

Part 1

Use and record a range of mental and written strategies to multiply by one- and two-digit operators
Use the formal algorithm for multiplication by one- and two-digit operators
Use and record a range of mental and written strategies to divide numbers with three or more digits by a one-digit operator, including problems that result in a remainder
Solve word problems and record the strategy used
Interpret remainders in division problems
Use estimation to check answers to calculations

Part 2

Select and apply efficient mental, written and calculator strategies to solve word problems and record the strategy used
Recognise and use grouping symbols
Apply the order of operations in calculations

Early Stage 1	Stage 1	Stage 2	Stage 3
Fractions and Decimals Establish the concept of one-half Record halves of objects using drawings	**Fractions and Decimals** ***Part 1*** Recognise, describe and represent one-half as one of two equal parts of whole objects, shapes and collections Use fraction notation $\frac{1}{2}$ ***Part 2*** Recognise, describe and represent halves, quarters and eighths of whole objects, shapes and collections Use fraction notation $\frac{1}{4}$ and $\frac{1}{8}$	**Fractions and Decimals** ***Part 1*** Model and represent fractions with denominators 2, 3, 4, 5 and 8 Count by halves, quarters and thirds, including with mixed numerals Represent fractions on number lines, including number lines that extend beyond 1 ***Part 2*** Model and find equivalence between fractions with denominators 2, 4 and 8; 3 and 6; and 5, 10 and 100 Apply the place value system to represent tenths and hundredths as decimals Make connections between fraction and decimal notation Model, compare and represent decimals with one and two decimal places Represent decimals on number lines	**Fractions and Decimals** ***Part 1*** Compare and order unit fractions with denominators 2, 3, 4, 5, 6, 8, 10, 12 and 100 Express mixed numerals as improper fractions and vice versa Model and represent strategies to add and subtract fractions with the same denominator Apply the place value system to represent thousandths as decimals Compare, order and represent decimals with up to three decimal places ***Part 2*** Represent, compare and order fractions with denominators 2, 3, 4, 5, 6, 8, 10, 12 and 100 Determine, generate and record equivalent fractions Write fractions in their 'simplest form' Add and subtract fractions, included mixed numerals, with the same or related denominators Multiply fractions by whole numbers Find a simple fraction of a quantity Use mental, written and calculator strategies to add and subtract decimals with up to three decimal places Use mental, written and calculator strategies to multiply decimals by one- and two-digit whole numbers Use mental, written and calculator strategies to divide decimals by one-digit whole numbers Multiply and divide decimals by 10, 100 and 1000 Solve word problems involving fractions and decimals, including money problems Make connections between equivalent percentages, fractions and decimals Use mental, written and calculator strategies to calculate 10%, 25% and 50% of quantities, including as discounts
Patterns and Algebra Sort and classify objects into groups Recognise, copy, continue, create and describe repeating patterns of objects and drawings	**Patterns and Algebra** ***Part 1*** Recognise, copy, continue, create and describe increasing and decreasing number patterns Recognise, copy, create, continue and describe repeating patterns of objects or symbols Model and describe odd and even numbers ***Part 2*** Describe patterns with numbers and identify missing elements Find missing numbers in number sentences involving one operation of addition or subtraction	**Patterns and Algebra** ***Part 1*** Identify, continue, create, describe and record increasing and decreasing number patterns Identify odd and even numbers of up to four digits ***Part 2*** Find missing numbers in number sentences involving addition or subtraction on one or both sides of the equals sign Investigate and use the properties of odd and even numbers Recognise, continue and describe number patterns resulting from performing multiplication Find missing numbers in number sentences involving one operation of multiplication or division	**Patterns and Algebra** ***Part 1*** Identify, continue create and describe increasing and decreasing number patterns with fractions, decimals and whole numbers Find missing numbers in number sentences involving multiplication or division on one or both sides of the equals sign ***Part 2*** Continue, create, record and describe geometric and number patterns in words Determine the rule for geometric and number patterns in words and use the rule to calculate values Locate and record the coordinates of points in all four quadrants of the Cartesian plane

Measurement and Geometry

Early Stage 1

Length

Identify the attribute of ‘length’ as a measure of an object from end to end
Describe length and distance using everyday language, including comparatives
Compare lengths using direct comparison
Record comparisons of length informally

Area

Identify the attribute of ‘area’ as a measure of the amount of surface
Describe area using everyday language, including comparatives
Compare areas using direct comparison
Record comparisons of area informally

Volume and Capacity

Identify the attribute of ‘capacity’ as a measure of the amount of substance a container can hold
Identify the attribute of ‘volume’ as a measure of the amount of space an object occupies
Describe capacity and volume using everyday language, including comparatives
Compare volumes and capacities using direct comparison
Record comparisons of capacity and volume informally

Mass

Identify the attribute of ‘mass’ as a measure of the amount of matter in an object
Describe mass using everyday language, including comparatives
Compare masses directly by hefting
Record comparisons of mass informally

Time

Compare and order the duration of events using everyday language
Sequence events in time
Connect days of the week to familiar events and actions
Tell time on the hour on digital and analog clocks

Stage 1

Length

Part 1

Use uniform informal units to measure, compare and estimate lengths

Part 2

Record lengths by referring to the number and type of uniform informal unit used
Compare and order shapes/objects based on length measured using uniform informal units
Recognise the need for formal units to measure length
Use metres and centimetres to measure and estimate lengths and distances
Record lengths using the abbreviations m and cm

Area

Part 1

Use uniform informal units to measure and estimate areas
Record areas by referring to the number and type of uniform informal unit used

Part 2

Compare and order surfaces based on area measured using uniform informal units

Volume and Capacity

Part 1

Use uniform informal units to measure, compare and estimate capacities
Use uniform informal units to measure and estimate volumes
Record capacities and volumes by referring to the number and type of uniform informal unit used

Part 2

Compare and order objects based on capacity and volume measured using uniform informal units

Mass

Part 1

Place objects on either side of a pan balance to obtain a level balance
Use a pan balance to compare two objects based on mass

Part 2

Use uniform informal units to measure, compare and estimate the masses of objects
Record masses by referring to the number and type of uniform informal unit used

Time

Part 1

Name and order months and seasons
Use a calendar to identify the date and determine the number of days in each month
Tell time to the half-hour

Part 2

Use a calendar to determine duration in months, weeks and days
Use informal units to measure and compare the durations of events
Experience activities with duration of one hour, half/quarter of an hour, one minute and a few seconds
Tell time to the quarter-hour, using the language of ‘past’ and ‘to’

Stage 2

Length

Part 1

Use metres, centimetres and millimetres to measure, compare, order and estimate lengths
Record lengths using the abbreviations m, cm and mm

Part 2

Select and use appropriate scaled instruments and units to measure and compare lengths
Estimate and measure perimeters of two-dimensional shapes
Convert between metres, centimetres and millimetres
Record lengths and distances using decimal notation to two decimal places
Use a scaled instrument to measure and compare temperatures
Record temperatures using the symbol for degrees (°)

Area

Part 1

Recognise the need for formal units to measure area
Use square centimetres and square metres to measure and estimate rectangular (and square) areas
Record lengths using the abbreviations cm^2 and m^2

Part 2

Measure and compare the areas of regular and irregular shapes using a square-centimetre grid
Compare areas measured in square centimetres and square metres

Volume and Capacity

Part 1

Recognise the need for formal units to measure capacity and volume
Use litres to measure, compare and estimate capacities and volumes
Use cubic centimetres to measure and compare volumes
Record capacities and volumes using the abbreviations L and cm^3

Part 2

Use litres and millilitres to measure, compare and estimate capacities and volumes
Record capacities and volumes using the abbreviations L and mL
Convert between litres and millilitres
Compare volumes of objects by submerging each in water

Mass

Part 1

Recognise the need for formal units to measure mass
Use kilograms to measure, compare, order and estimate masses
Record masses using the abbreviation kg

Part 2

Use kilograms and grams to measure and compare masses using a scaled instrument
Record masses using the abbreviations kg and g

Time

Part 1

Recognise the coordinated movements of the hands on a clock
Read and record time to the minute, using digital notation and the terms ‘past’ and ‘to’

Part 2

Convert between seconds, minutes, hours and days
Use and interpret am and pm notation
Read and interpret simple timetables, timelines and calendars

Stage 3

Length

Part 1

Use the kilometre to measure lengths and distances
Select and use appropriate instruments and units to measure lengths
Record lengths and distances using the abbreviations km, m, cm and mm
Find perimeters of common two-dimensional shapes and record the strategy

Part 2

Record lengths and distances using decimal notation to three decimal places
Convert between kilometres, metres, centimetres and millimetres
Solve problems involving length and perimeter

Area

Part 1

Recognise the need for square kilometres and hectares to measure area
Record areas using the abbreviations km^2 and ha
Develop a strategy to find areas of rectangles (including squares) and record the strategy in words

Part 2

Develop a strategy to find areas of triangles and record the strategy in words
Solve problems involving areas of rectangles (including squares) and triangles

Volume and Capacity

Part 1

Use cubic centimetres and cubic metres to measure and estimate volumes
Select and use appropriate units to measure volume
Record volumes using the abbreviations cm^3 and m^3

Part 2

Connect volume and capacity and their units of measurement
Record volumes and capacities using decimal notation to three decimal places
Convert between millilitres and litres
Develop a strategy to find volumes of rectangular prisms and record the strategy in words

Mass

Part 1

Recognise the need for tonnes to measure mass
Record masses using the abbreviations t, kg and g
Select and use appropriate instruments and units to measure mass
Distinguish between ‘gross mass’ and ‘net mass’
Solve problems involving mass

Part 2

Record mass using decimal notation to three decimal places
Convert between tonnes, kilograms and grams

Time

Part 1

Convert between 12- and 24-hour time
Determine and compare the duration of events

Part 2

Interpret and use timetables
Draw and interpret timelines using a given scale

Early Stage 1	Stage 1	Stage 2	Stage 3
Three-Dimensional Space Describe features of common three-dimensional objects using everyday language Sort and manipulate three-dimensional objects found in the environment	**Three-Dimensional Space** ***Part 1*** Distinguish between flat and curved surfaces Use the term 'faces' to describe flat surfaces with straight edges Identify cones, cubes, cylinders, spheres and prisms presented in different orientations, in pictures and the environment Recognise that three-dimensional objects look different from different vantage-points ***Part 2*** Use the terms 'flat surface', 'curved surface', 'face', 'edge' and 'vertex' appropriately to describe three-dimensional objects Recognise faces of three-dimensional objects as two-dimensional shapes Distinguish between three-dimensional objects and two-dimensional shapes Represent three-dimensional objects in models and drawings	**Three-Dimensional Space** ***Part 1*** Identify, describe and compare features of prisms, pyramids, cylinders, cones and spheres Make models of three-dimensional objects Create nets from everyday packages ***Part 2*** Represent three-dimensional objects in drawings showing depth Sketch three-dimensional objects from different views Interpret and make drawings of objects on isometric grid paper	**Three-Dimensional Space** ***Part 1*** Name prisms and pyramids according to the shape of their 'base' Recognise that prisms have a uniform cross-section and pyramids do not Describe and compare properties of prisms and pyramids in terms of their faces, edges and vertices Connect three-dimensional objects with their nets ***Part 2*** Construct prisms and pyramids using a variety of materials, and given drawings from different views
Two-Dimensional Space Identify, name and describe circles, squares, triangles and rectangles presented in different orientations, in pictures and the environment Sort, manipulate, make and draw circles, squares, triangles and rectangles	**Two-Dimensional Space** ***Part 1*** Identify horizontal, vertical and parallel lines Identify and name triangles, quadrilaterals, pentagons, hexagons and octagons presented in different orientations, in pictures and the environment Use the terms 'side' and 'vertex' to describe and compare two-dimensional shapes ***Part 2*** Make and draw two-dimensional shapes in different orientations Identify, perform and record the result of one-step 'slides' and 'flips' Make symmetrical designs with a variety of materials Identify, perform, describe and record the result of full, half and quarter 'turns'	**Two-Dimensional Space** ***Part 1*** Identify and name the special quadrilaterals presented in different orientations Identify and describe shapes as 'regular' or 'irregular' Describe and compare features of shapes, including the special quadrilaterals Identify and draw lines of symmetry on shapes ***Part 2*** Combine common shapes to form other shapes and record the arrangement Split common shapes into other shapes and record the result Use transformations to create and describe symmetrical designs Create and record tessellating designs	**Two-Dimensional Space** ***Part 1*** Identify, name and draw right-angled, equilateral, isosceles and scalene triangles Compare and describe side properties of the special quadrilaterals and special triangles Explore angle properties of the special quadrilaterals and special triangles Classify and draw regular and irregular two-dimensional shapes from descriptions of their features Use the terms 'translate', 'reflect' and 'rotate' to describe transformations of shapes Identify line and rotational symmetries Make and compare enlargements of shapes/pictures ***Part 2*** Identify, describe, compare and draw diagonals of two-dimensional shapes Identify and name parts of circles Identify, use and describe combinations of translations, reflections and rotations
		Angles ***Part 1*** Identify and describe angles as measures of turn Compare angle sizes in everyday situations Identify 'perpendicular' lines and 'right angles' ***Part 2*** Draw and classify angles as acute, obtuse, straight, reflex or a revolution	**Angles** ***Part 1*** Recognise the need for formal units to measure angles Measure, compare and estimate angles in degrees (up to 360°) Record angle measurements using the symbol for degrees (°) Construct angles using a protractor (up to 360°) Describe angle size in degrees for each angle classification ***Part 2*** Identify and name angle types formed by the intersection of straight lines, including 'angles on a straight line', 'angles at a point' and 'vertically opposite angles' Use known angle results to find unknown angles in diagrams
Position ***Part 1*** Give and follow simple directions Describe position using everyday language Use the terms 'left' and 'right' to describe position in relation to self	**Position** ***Part 1*** Give and follow directions to move to familiar locations and to position objects Use the terms 'left' and 'right' to describe position in relation to self and from the perspective of a person facing in the opposite direction Describe a path from one location to another ***Part 2*** Interpret simple maps of familiar locations Represent the position of objects in models, photographs and drawings	**Position** ***Part 1*** Use grid-referenced maps to locate and describe positions and pathways Draw simple maps, with and without a grid ***Part 2*** Determine directions N, E, S, W and NE, SE, SW, NW, given one of the directions Interpret legends and directions on maps Use the scale to calculate the distance between two points on maps	**Position** Use grid-referenced maps to locate and describe positions Follow a sequence of directions, including compass directions, to find a particular location on a map Describe routes using landmarks and directional language *Note: There is only one part in the Position substrand in Stage 3.*

Statistics and Probability

Early Stage 1	Stage 1	Stage 2	Stage 3
Data Collect information about themselves and their environment Organise actual objects into data displays Interpret data displays made from objects	**Data** ***Part 1*** Collect data and track what has been counted Create data displays using objects and pictures (one-to-one correspondence) and interpret them ***Part 2*** Pose questions and collect categorical data Create data displays using lists, tables and picture graphs (one-to-one correspondence) and interpret them	**Data** ***Part 1*** Plan methods for data collection Collect data, organise into categories and create displays using lists, tables, picture graphs and simple column graphs (one-to-one correspondence) Interpret and compare data displays ***Part 2*** Select, trial and refine methods for data collection, including survey questions and recording sheets Construct data displays, including tables, and column graphs and picture graphs of many-to-one correspondence Evaluate the effectiveness of different displays	**Data** ***Part 1*** Collect categorical and numerical data by observation and by survey Construct data displays, including tables, column graphs, dot plots and line graphs, appropriate for the data type Describe and interpret data presented in tables, column graphs, dot plots and line graphs ***Part 2*** Interpret and create two-way tables Interpret side-by-side column graphs Compare a range of data displays to determine the most appropriate display for particular sets of data Interpret and critically evaluate data presented in digital media and elsewhere
	Chance ***Part 1*** Recognise the element of chance in familiar situations Describe chance events using everyday language ***Part 2*** Identify practical activities and everyday events that involve chance Describe events as ‘likely’ or ‘unlikely’ Distinguish between ‘possible’ and ‘impossible’ events Identify some events as ‘certain’ or ‘impossible’	**Chance** ***Part 1*** Identify and describe possible ‘outcomes’ of chance experiments Predict and record all possible combinations in a chance situation Conduct chance experiments and compare predicted with actual results ***Part 2*** Describe possible everyday events and order their chances of occurring Identify everyday events where one occurring cannot happen if the other happens Identify events where the chance of one occurring will not be affected by the occurrence of the other	**Chance** ***Part 1*** List outcomes of chance experiments involving equally likely outcomes Represent probabilities using fractions Recognise that probabilities range from 0 to 1 ***Part 2*** Compare observed frequencies in chance experiments with expected frequencies Represent probabilities using fractions, decimals and percentages Conduct chance experiments with both small and large numbers of trials