The New Zealand Curriculum

Mathematics and Statistics Years 0–10

2025

Contents

Purpose statement

Ānō me he whare pūngāwerewere.

Behold, it is like the web of a spider.

This whakataukī celebrates intricacy, complexity, interconnectedness, and strength. The Learning Area of Mathematics and Statistics weaves together the effort and creativity of many cultures that over time have used mathematical and statistical ideas to understand their world.

The Mathematics and Statistics Learning Area equips students with conceptual and procedural knowledge that empowers them to explore and make sense of the world. Mathematics and Statistics allows students to appreciate and draw on the power of abstraction, visualisation, and symbolic representation to connect new knowledge to their current understandings of quantity, space, time, data, and uncertainty. Students are taught logical reasoning and critical thinking skills that help them to evaluate information, question assumptions, and express ideas clearly.

Through the study of mathematical and statistical reasoning, students learn how to differentiate what is probable from what is possible and draw reliable conclusions about what is reasonable. As students are taught to notice patterns and variation, select approaches, draw conclusions, and justify their solutions, they build confidence in their mathematical and statistical abilities and problem-solving skills, applying these to new contexts.

The Mathematics and Statistics Learning Area provides students with concepts and tools to investigate, represent, and connect situations, as well as to generalise, explain, and justify their findings. Students learn that Mathematics and Statistics is a creative discipline that sparks curiosity and wonder and that it has been shaped by the contributions of diverse people and cultures over time.

As students progress through the Learning Area, they deepen their understanding of how to use mathematics and statistics accurately, efficiently, and confidently in increasingly complex ways. They are encouraged to engage with important societal issues — such as ethically gathering, interpreting, and communicating data — and to observe and describe similarities, patterns, and trends across natural, technological, and social contexts.

Learning Area Structure

The year-by-year teaching sequences for Mathematics and Statistics lay out the knowledge and practices to be taught each year. The teaching sequences for Years 0–10 are organised into six strands: Number, Algebra, Measurement, Geometry, Statistics, and Probability.

Number focuses on numerical concepts and systems. It develops students' understanding of how numbers are used to represent quantities, estimate, measure, and perform calculations, and how number systems have evolved to meet practical and social needs.

Algebra focuses on generalisation and mathematical reasoning. It develops students' understanding of how patterns and relationships can be represented using symbols, graphs, and diagrams, and how algebraic thinking supports problem solving and communication.

Measurement focuses on quantifying phenomena using units and systems. It develops students' understanding of how to measure tangible and intangible quantities using standard and non-standard units, and how measurement systems vary across cultures and contexts.

Geometry focuses on shape, space, and transformation. It develops students' understanding of how to visualise, represent, and reason about objects and their position, orientation, and movement, drawing on geometric ideas used across cultures and in the natural world.

Statistics focuses on data and uncertainty. It develops students' understanding of how to collect, organise, and interpret data in context, and how statistical thinking supports informed decision making.

Probability focuses on chance and likelihood. It develops students' understanding of how to quantify uncertainty, make predictions, and evaluate the likelihood of events, supporting probabilistic reasoning in everyday and applied contexts.

The year-by-year teaching sequences, organised through strands and elements, set out what is to be taught. Their enactment is shaped by teachers, who design learning in response to their learners, adjusting the order and emphasis, and adding contexts and content as appropriate.

Introduction

Across years 0–10, Mathematics and Statistics takes students on a journey of increasingly sophisticated thinking about number, patterns, space, and data. Through purposeful exploration and practice, students build the knowledge and fluency they need to solve problems, reason logically, and make sense of the world around them.

The mathematical and statistical processes of investigating, representing and connecting situations, and generalising, explaining, and justifying findings are fundamental to all mathematical and statistical teaching and underpin the way students gain understanding of the knowledge and practices being taught.

Phase 1 (Years 0–3)

In Years 0–3, teaching focuses on building students' ability to investigate, classify, and describe quantities, shapes, and data. Teachers draw attention to properties of numbers and attributes of shapes. Materials and pictures support visualisation of these numerical and geometric concepts. Explicit teaching enables students to make connections between representations and to develop their reasoning.

Phase 2 (Years 4–6)

In Years 4–6, teaching focuses on students' use of a variety of representations to model number operations and to solve word problems. They extend their understanding of whole numbers to fractions and decimals, and they visualise, classify, and draw angles using benchmarks to support and justify their classifications. Students apply their knowledge of number operations to reasoning about measurements and to investigating variations in patterns, shapes, probabilities, and data. They begin to work with exponents, can tell the time, and convert between units of time.

Phase 3 (Years 7–8)

In Years 7 and 8, teaching focuses on students' use of logic and reasoning to identify, clarify, and solve problems, make connections between mathematical and statistical concepts, and investigate patterns and variation. They use appropriate conventions, vocabulary, and algebraic notation to clearly explain solutions and justify their approaches to solving problems. Students select, use, and adapt representations to visualise and extend their reasoning (e.g. number lines to represent integers, and equations to represent linear patterns). They make generalisations, identify and calculate unknown quantities (e.g. the size of angles), and use data visualisations to evaluate claims and make conjectures. They begin to explore irrational numbers and to operate fluently with integers.

Phase 4 (Years 9–10)

In Years 9 and 10, teaching focuses on students' use of proportional reasoning to transform numerical quantities, measurements, and shapes, including right-angled triangles. They begin to generalise their understanding and application of tables, equations, and graphs, including to explore patterns and the connections between different representations. They extend their understanding of area, perimeter, and volume for a variety of 2D shapes, including circles, and 3D shapes, including prisms. They use data visualisations to investigate, represent, and explain patterns, trends, and variation, and they apply their knowledge to situations involving chance.

The Mathematics and Statistics learning area prepares students with the knowledge and practices they need to access related curriculum subjects in Years 11–13, such as Statistics, Mathematics, and Physics.

Phase 1 (Years 0–3) teaching sequence

Number

Number	Knowledge *The facts, concepts, principles, and theories to teach.*				Practices *The skills, strategies, and applications to teach.*			
	During the first six months	**During the first year**	**During the second year**	**During the third year**	**During the first six months**	**During the first year**	**During the second year**	**During the third year**
Number structures	• The whole numbers from 0 to 20 form a sequence. • Each whole number has a unique name and numeral. • The names of numbers between 13 and 19 use the '–teen' suffix. • Numbers in counting order are ordered from smallest to largest. • Numbers can be placed on a number line to show order and magnitude. • Numbers can be used to represent ordinal position in sequences (e.g. 1st, 2nd, 3rd).	• The whole numbers from 0 to 100 form a sequence. • The base 10 number system is organised by place value (tens and ones for two-digit numbers). • The names of numbers between 20 and 99 use the '–ty' suffix. • Ordinal suffixes (e.g. –st, –rd, –nd, –th) can be used to represent a position in a sequence (e.g. 2nd, 3rd). • Te reo Māori number naming is based on place value (e.g. rua tekau mā tahi — two 10s and 1).	• The whole numbers from 0 to 120 form a sequence. • The base 10 number system is organised by place value (hundreds, tens, and ones for three-digit numbers). • The names of numbers between 101 and 120 use 'one hundred and –' phrasing. • The place value of digits helps with comparing and ordering.	• The whole numbers from 0 to 1000 form a sequence. The base 10 number system is organised by place value (thousands, hundreds, tens, and ones for four-digit numbers).	• Reading and writing whole numbers up to 20 • Counting forwards or backwards from any whole number between 1 and 10, and then between 1 and 20 • Comparing and ordering whole numbers up to 20 and ordinal numbers up to 5th, using words • Locating whole numbers on a fully labelled number line	• Reading and writing whole numbers up to 100, and representing them using base 10 structure • Counting forwards or backwards from any whole number between 1 and 20, and then between 1 and 100 • Comparing and ordering whole numbers and ordinal numbers using representations, words, or numerals, and suffixes to 100 • Using te reo Māori for numbers up to 30 • Locating numbers on a partially labelled number line (e.g. 17 on a number line labelled in 5s)	• Reading and writing whole numbers up to 120, and representing them using base 10 structure • Comparing and ordering whole numbers up to 120 • Using te reo Māori for numbers up to 100 • Recognising the place value of each digit in a two-digit number, and a three-digit number up to 120 • Approximately locating numbers up to 120 on a partially labelled number line (e.g. 61 on a number line labelled in tens)	• Reading and writing whole numbers up to 1,000, and representing them using base 10 structure • Comparing and ordering whole numbers up to 1,000 • Recognising the place value of each digit in a three-digit number
	• Small collections can be recognised without counting. • When counting collections, each object is counted once and only once (the one-to-one principle). • The last number counted is the number of objects in the collection (the cardinality principle).	• Counting can be organised in groups (e.g. ten ones can be renamed as one 10). • The same value can be represented with different groupings (e.g. 12 is six pairs or 12 ones or one 10 and two ones).	• Arranging objects into groups can help when finding their total. • Groups of 10s are used to structure and count larger collections. • Ten 10s can be renamed as one 100.	• Groups of 10s and 100s are useful ways to structure and count large numbers. • Ten 100s can be renamed as one 1,000.	• Subitising (recognising without counting) the number of objects in a small collection (3–5 objects) • Counting collections of up to 10 objects using one-to-one correspondence • Recognising when a quantity is greater than, less than, or the same as another quantity	• Subitising (recognising without counting) smaller groups of objects within a larger collection (e.g. 3 and 5 in a group of 8 objects) • Counting collections of objects using one-to-one correspondence, and then by pairs, for up to 20 objects • Finding the total number of objects up to 20 by grouping (using pairs, 5s, or 10s)	• Finding the total number of objects up to 120 by separating them into groups (e.g. groups of ten)	• Finding the total number of objects beyond 120 by first separating them into groups (e.g. groups of 10 or 100)
			• Rounding to the nearest 10 depends on the value of the ones place; a number line supports this	• Rounding to the nearest 100 depends on the value of the 10s place; a number line supports this • Numbers can be rounded to support estimation before calculating.			• Rounding numbers up to 120 to the nearest 10	• Rounding numbers to the nearest 10 or 100 • Estimating the answer to a calculation
		• Counting in 2s from zero or an even number produces even numbers. • Counting in 2s from an odd number produces odd numbers.	• Sequences generated by counting can overlap (e.g. counting in 2s and counting in 5s overlap for numbers that are multiples of 2 and 5). • Counting in 3s produces alternating patterns of odd and even numbers. • Numbers ending in the digits 0, 2, 4, 6, and 8 are even and numbers ending in 1, 3, 5, 7, and 9 are odd.			• Counting forwards and backwards in 2s and 10s from any whole number between 0 and 100	• Counting forwards in 3s from multiples of 3s • Counting forwards and backwards in 2s, 5s, and 10s from any whole number between 0 and 120 • Identifying odd and even numbers up to 120	• Counting forwards and backwards in 2s, 3s, 4s, 5s, and 8s from multiples of these numbers (e.g. 20, 15, 10, 5; 8, 16, 24, 32) • Counting forwards and backwards in 10s and 100s from any whole number between 0 and 1000

Number	**Knowledge** *The facts, concepts, principles, and theories to teach.*				**Practices** *The skills, strategies, and applications to teach.*			
	During the first six months	**During the first year**	**During the second year**	**During the third year**	**During the first six months**	**During the first year**	**During the second year**	**During the third year**
Operations	• Addition is putting parts together to find a total or whole. • Subtraction is separating a number into two or more parts or finding the difference between two numbers.	• Adding or subtracting 0 does not change a number (the additive identity property). • Changing the order in which numbers are added does not change the result (the commutative property of addition). • When subtracting numbers, the order of numbers is important (i.e. subtraction is not commutative).	• Number facts can be derived from known facts using place value (e.g. $70 + 20 = 90$ can be derived from $7 + 2 = 9$). • Addition and subtraction are inverse operations. • Numbers can be added and subtracted using representations, mental strategies, known facts, and place value.	• Number facts can be derived from known facts using place value (e.g. $700 + 200 = 900$ can be derived from $7 + 2 = 9$) • Renaming (regrouping) is needed when adding or subtracting across place values. • Column methods for addition and subtraction align digits in numbers by their place values.	• Memorising addition and subtraction facts up to 5 (e.g. $2 + 3 = 5$) • Naming the number before or after a given number in the counting sequence up to 10	• Memorising addition and subtraction facts up to 10, including $10 + 0 = 10$ (e.g. $7 + 3 = 10$) • Memorising doubles and halves to 10 • Naming the number before or after a given number in the counting sequence up to 20 • Adding and subtracting one- and two-digit numbers up to 20, including 0 • Joining and separating groups of up to 20 objects (e.g. $9 + 6$, $7 + \_ = 11$) • Adding ten to a one-digit number • Solving one-step problems involving addition and subtraction using objects and pictorial representations	• Memorising addition and subtraction facts up to 20 (e.g. $17 + 3 = 20$) • Memorising doubles and halves to 20 • Adding and subtracting numbers up to 100 (e.g. $32 + 20$ or $32 + 2$) • Adding and subtracting 3 one-digit numbers (e.g. $7 + 3 + 6$). • Adding 100 to a one-digit number • Solving one-step addition and subtraction problems involving numbers up to 100 • Solving multi-step addition and subtraction problems involving numbers up to 20	• Finding the complement of a number to 100 (e.g. $34 + \_ = 100$) • Adding and subtracting numbers up to 1000 (e.g. $329 + 3$, $329 + 80$, $329 - 200$, $137 + 54$) • Solving one-step addition and subtraction problems involving numbers up to 1000 • Solving multi-step addition and subtraction problems involving numbers up to 100
		• Multiplication involves combining equal groups. • Division involves equal grouping or sharing. • Counting objects in equal groups can be used to multiply (combining) or divide (sharing).	• Arrays and groups can be used to represent and solve multiplication and division problems. • Multiplying and dividing by 1 gives the same number (the identity property of multiplication). • Multiplying by zero always results in zero (the zero property of multiplication). • Two numbers can be multiplied in either order without changing the result; the same is not true when dividing (the commutative property of multiplication). • Multiplication and division are inverse operations.	• Multiplication can be completed by repeated addition, grouping, or using known facts, and represented using an array. • Division can be completed by equal sharing, grouping, repeated subtraction, or using known facts. • Dividing by zero is impossible.		• Multiplying and dividing using equal grouping or counting for products and dividends within 20	• Identifying the relationship between skip counting and multiplication facts for 2s, 5s, and 10s • Memorising multiplication and corresponding division facts for 2s, 5s, and 10s • Multiplying and dividing with products and dividends up to 100	• Multiplying or dividing using equal sharing, grouping, repeated addition or subtraction, or known facts • Memorising multiplication and corresponding division facts for 2s, 3s, 4s, 5s, 8s, and 10s • Multiplying a one- or two-digit number by a one-digit number (e.g. 4×6; 2×23) • Dividing whole numbers by a one-digit divisor with no remainders (e.g. $24 \div 3$, $32 \div 4$)
Rational numbers		• Fractions describe parts of a whole. • A whole can be divided into halves (i.e. two equal parts). • A whole can be divided into quarters (i.e. four equal parts). • A half means one part of a set that has been divided into two equal groups or parts.	• The denominator of a fraction shows the total number of equal parts a whole is divided into. • The numerator of a fraction shows the number of parts being counted or considered. • Fractions can be named (e.g. half) or written using words and symbols.	• Fractions can represent parts of sets, regions, measurements, and points on a number line. • A unit fraction represents one part of an equally divided whole. Its numerator is 1. • For unit fractions, the larger the denominator, the smaller the fraction (e.g. $\frac{1}{12} < \frac{1}{6}$).		• Recognising and representing halves and quarters as fractions of sets, quantities, and regions, using equal parts of the whole • Finding a half or quarter of a set using equal sharing and grouping • Connecting $\frac{1}{2}$ and $\frac{1}{4}$ through halving	• Recognising, reading, writing (using symbols and words), and representing halves, thirds, and quarters ($\frac{1}{3}, \frac{1}{4}, \frac{2}{4}, \frac{1}{2}, \frac{2}{3}, \frac{3}{4}$) as fractions of sets, quantities, and regions, using equal parts of the whole • Recognising the equivalence of $\frac{2}{4}$ and $\frac{1}{2}$	• Reading, writing, and representing fractions of sets, quantities, and measurements on a number line, and of regions, using small denominators • Counting in unit fractions up to 1 • Comparing unit fractions with denominators up to 12

Number	**Knowledge** *The facts, concepts, principles, and theories to teach.*				**Practices** *The skills, strategies, and applications to teach.*			
	During the first six months	**During the first year**	**During the second year**	**During the third year**	**During the first six months**	**During the first year**	**During the second year**	**During the third year**
		• A quarter means one part of a set that has been divided into four equal groups or parts. • Equal sharing means division into groups with the same number of objects in each group. • Fractions of sets can be found by sharing.	• Equivalent fractions represent the same amount of the whole value (e.g. two quarters vs a half). • A half is 1 of 2 equal parts, a third is 1 of 3 equal parts, and a quarter is 1 of 4 equal parts. • Halves are larger than thirds, which are larger than quarters (when comparing fractions of the same whole).	• Fractions with the same denominator can be ordered by the size of the numerator. • Equivalent fractions name the same quantity and can be identified by reasoning about equal parts (e.g. $\frac{3}{6} = \frac{1}{2}$). • There are many ways to write one whole (e.g. $\frac{2}{2}, \frac{3}{3}, \frac{4}{4}, \frac{6}{6}$ are all equivalent to 1).			• Directly comparing two fractions involving halves, thirds, or quarters	• Comparing non-unit fractions with the same denominator up to 12 • Identifying when two fractions are equivalent, using representations
				• When adding or subtracting fractions with the same denominator, the denominators remain unchanged, and the numerators are combined. • Subtraction of fractions with the same denominator represents taking away parts of equal size.				• Adding and subtracting fractions with the same denominator within a whole (e.g. $\frac{1}{8} + \frac{2}{8} + \frac{3}{8} = \frac{6}{8}$)
			• The size of the whole can be determined if a fractional part is known (e.g. if $\frac{1}{2} = 5$, then the whole is 10).	• The relationship between part and whole is multiplicative, not additive.			• Finding a half, quarter, or third of a set by identifying groups and patterns (rather than sharing by ones) • Finding a whole when given a $\frac{1}{2}, \frac{1}{3}, \text{or } \frac{1}{4}$ of a length, shape, or set of objects or quantities	• Finding a unit fraction of a whole number by connecting to division (e.g. $\frac{1}{3}$ of 15 is found by $15 \div 3$) • Finding the whole when given a unit fraction by connecting to repeated addition or multiplication (e.g. if $\frac{1}{4}$ of a set is 3, the whole set is $4 \times 3 = 12$)
Financial mathematics		• New Zealand coins and notes have different values.	• New Zealand coins and notes can be ordered and grouped to find the total value.	• New Zealand currency is a decimal system of dollars made up of 100 cents. • Finding the total cost and giving change with money involves addition and subtraction.		• Recognising and knowing the value of New Zealand denominations of currency (i.e. coins and notes)	• Recognising and ordering New Zealand denominations according to their value, making groups of 'like' denominations, and calculating their value • Combining denominations of currency (either all notes or all coins) to make a particular value	• Representing currency values of mixed dollars and cents without using decimal notation (e.g. $2 and 50 cents) • Making amounts of money using one- and two-dollar coins and 5-, 10-, 20-, 50-, and 100-dollar notes • Using addition and subtraction to give change

Algebra

Algebra	Knowledge *The facts, concepts, principles, and theories to teach.*				Practices *The skills, strategies, and applications to teach.*			
	During the first six months	**During the first year**	**During the second year**	**During the third year**	**During the first six months**	**During the first year**	**During the second year**	**During the third year**
Equations and relationships		• The symbols $+$ and $-$ represent addition and subtraction, and the equal sign shows that two sides of an equation represent the same quantity. • An open number sentence is a statement that contains an unknown value.	• The symbols $\times$ and $\div$ represent multiplication and division in number sentences. • Numbers can be compared using “greater than” (>), “less than” (<), and equals (=).			• Completing open number sentences involving addition and subtraction of one-digit numbers (e.g. $2 + 5 = 3 + \_$) • Checking the truth of number sentences involving addition and subtraction of one-digit numbers (e.g. $7 - 5 = 6 - 4$, true or false?)	• Checking the truth of number sentences involving direct comparisons of whole numbers up to 120 (e.g. $16 > 60$, true or false?) • Checking the truth of number sentences and completing open number sentences involving addition, subtraction, multiplication, or division using tens frames, discrete materials, or number lines (e.g. $18 + \_ = 17 + 6$, $6 \div \_ = 2$, $2 + 2 + 2 = 3 \times 2$, true or false?)	• Checking the truth of number sentences involving direct comparisons of whole numbers up to 1,000 (e.g. $313 < 330$, true or false?) • Checking the truth of number sentences and completing open number sentences involving addition, subtraction, multiplication, or division (e.g. $217 - \_ = 105$, $12 \div 3 = 5 - 2$, true or false?)
	• Patterns are made up of elements (including numeric or spatial elements) in a sequence governed by a rule, and they arise in a range of situations (e.g. cultural patterns, patterns in the local environment, patterns on everyday objects). • Ordinal numbers (e.g. 1st, 2nd, 3rd) can be used to describe the elements in a sequence. • Repeating patterns have a repeating group of elements called the unit of repeat. • A missing element can be predicted from other elements in the pattern.			• A growing number pattern is a sequence of numbers that increase or decrease from one term to the next due to a consistent rule.	• Copying, continuing, creating, and describing a repeating pattern with two elements (e.g. cat, dog, cat, dog, ____, ____) • Using ordinal numbers up to 5th place to describe position in a sequence	• Copying, continuing, creating, and describing a repeating pattern with three elements • Identifying missing elements in a pattern (e.g. red, green, blue, red, _____, blue)	• Recognising and describing the unit of repeat in a repeating pattern, and using the unit of repeat and ordinal position in a repeating pattern to predict further elements (e.g. ACDC in the pattern ACDCACDCACDC)	• Recognising, continuing, and creating growing number patterns

Measurement

Measurement	Knowledge *The facts, concepts, principles, and theories to teach.*				Practices *The skills, strategies, and applications to teach.*			
	During the first six months	**During the first year**	**During the second year**	**During the third year**	**During the first six months**	**During the first year**	**During the second year**	**During the third year**
Measuring	• Length is the distance between two points. • Weight is how heavy something feels. • Capacity is the maximum amount of liquid a container can hold.		• Standard measuring units are universally agreed and commonly used units for making measurements that enable people to communicate clearly. • Measuring tools are usually marked with standard units to ensure consistent measurements of properties such as length, mass (weight), and capacity.	• Systems of measurement have a history; different cultures use different approaches (e.g. measurement in te ao Māori is based on the human body and natural relationships).	• Directly comparing two objects by an attribute (e.g. length, mass (weight), capacity)	• Comparing the length, mass (weight), or capacity of objects directly or indirectly (e.g. by comparing each of them with another reference object, used repeatedly) • Using comparative language for lengths and heights (longer, shorter, taller) and mass (heavier, lighter)	• Estimating and using an informal unit repeatedly to measure the length, mass (weight), or capacity of an object • Comparing and ordering several objects using informal units of length, mass (weight), or capacity • Estimating and measuring length (cm), mass (g), and capacity (mL), using tools with labelled markings and whole-number metric units	• Estimating and measuring length (cm and m), mass (g and kg), and capacity (mL and L), using tools with labelled markings and whole-number metric units • Comparing and ordering objects using whole-number metric units of length, mass, or capacity

<table>
<tr><th rowspan="2">Measurement</th><th colspan="4">Knowledge
The facts, concepts, principles, and theories to teach.</th><th colspan="4">Practices
The skills, strategies, and applications to teach.</th></tr>
<tr><th>During the first six months</th><th>During the first year</th><th>During the second year</th><th>During the third year</th><th>During the first six months</th><th>During the first year</th><th>During the second year</th><th>During the third year</th></tr>
<tr><td rowspan="6"></td><td colspan="2"></td><td>• When measuring length, area, or volume, the measurement units must remain the same and there must be no gaps or overlaps between them.</td><td></td><td></td><td></td><td></td><td></td></tr>
<tr><td rowspan="2"></td><td rowspan="2"></td><td rowspan="2">• The distance around the boundary of a 2D shape gives its perimeter.
• A polygon is a 2D straight-edged shape where the sides connect to form a closed shape.</td><td rowspan="2">• Perimeter is the sum of the lengths of sides of a 2D shape.
• Area is the measure of a region's size on a surface.</td><td rowspan="2"></td><td rowspan="2"></td><td colspan="2">• Measuring the perimeter of polygon using metric units</td></tr>
<tr><td></td><td>• Measuring the area of rectangles using squares of equal size</td></tr>
<tr><td></td><td></td><td colspan="2">• A turn is a rotation around a point.
• A turn can be directional and is described using clockwise (to the right) and anticlockwise (to the left).</td><td></td><td></td><td colspan="2">• Turning an object or person and describing how far they have turned, using full, half, quarter, and three-quarter turns as benchmarks</td></tr>
<tr><td rowspan="2">• The weekdays are Monday through Friday.
• The weekend consists of the days Saturday and Sunday.</td><td rowspan="2">• Time can be measured in a range of units: years, months, weeks, days, hours, minutes, and seconds.
• Time is measured using clocks, which can be analogue or digital.
• A sequence of events can be described using everyday language (e.g. before, after, tomorrow, yesterday, next, and last).
• The parts of the day include morning, midday, noon, afternoon, evening, night, and midnight.</td><td colspan="2">• Duration is the length of time between the start and end of an event.</td><td rowspan="2">• Connecting days of the week to familiar events and daily routines (e.g. via the class timetable)
• Naming and ordering the days of the week, including naming the day before and the day after</td><td rowspan="2">• Telling the time on analogue and digital clocks to the hour, using the language of 'o'clock'
• Selecting appropriate units of time to communicate approximate durations in years, months, weeks, days, hours, minutes, or seconds
• Sequencing events in a day using everyday language of time (e.g. after, before, earlier, later, tomorrow, yesterday, the day after, next)</td><td rowspan="2">• Naming and ordering the months and seasons
• Describing durations of familiar events using years, months, weeks, and days, or hours, minutes and seconds
• Telling the time on analogue and digital clocks to the hour, half-hour, and quarter-hour, using the language of ‘past’ and 'o'clock'
• Naming the month before and the month after
• Using ordinal numbers to identify months of the year</td><td rowspan="2">• Identifying the duration of events using years, months, weeks, days, hours, minutes, and seconds
• Telling the time on analogue and digital clocks to the nearest 5 minutes and the nearest minute, using the language of minutes past the hour and to the hour
• Describing the differences in duration between units of time (e.g. days vs weeks, months vs years)</td></tr>
<tr><td>• There are 60 minutes in an hour.
• There are 30 minutes in half an hour.</td><td>• There are 15 minutes in a quarter of an hour.
• There are 60 seconds in a minute.
• There are 24 hours in a day, 365 days in a year, and 366 days in a leap year.
• There are 52 weeks in a year.
• A leap year occurs every 4 years.
• Months are approximately four weeks long; the specific number of days in each month varies.
• Larger durations of time can be measured in decades (10 years), centuries (100 years), and millennia (1,000 years).</td></tr>
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Geometry

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<tr><th rowspan="2">Geometry</th><th colspan="4">Knowledge
The facts, concepts, principles, and theories to teach.</th><th colspan="4">Practices
The skills, strategies, and applications to teach.</th></tr>
<tr><th>During the first six months</th><th>During the first year</th><th>During the second year</th><th>During the third year</th><th>During the first six months</th><th>During the first year</th><th>During the second year</th><th>During the third year</th></tr>
<tr><td>**Shapes**</td><td>• 2D shapes have attributes such as size, colour, sides, angles, and corners that can be observed and described using geometric language.
• Shapes have the same name despite their colour or size.</td><td>• 3D shapes have attributes such as size, colour, faces, edges, and vertices that can be observed and described using geometric language.</td><td>• Te reo Māori supports identifying shape attributes (e.g. triangle | tapatoru, square | tapawhā rite, same | ōrite, different | rerekē).</td><td>• A regular polygon is a two-dimensional shape with all sides of equal length and all interior angles of equal measure.</td><td>• Identifying, sorting by one attribute, and describing familiar 2D shapes, including triangles, circles, and rectangles (including squares)</td><td>• Identifying, describing, and sorting by one attribute familiar 2D and 3D shapes presented in different orientations, including cubes, cylinders, and spheres</td><td>• Identifying, describing, visualising, and sorting 2D and 3D shapes, including ovals, semicircles, polygons (e.g. hexagons, pentagons), rectangular prisms (cuboids), pyramids, and cones, using the attributes of shapes</td><td>• Identifying, describing, visualising and sorting regular polygons with up to 10 sides</td></tr>
<tr><td>**Spatial reasoning**</td><td></td><td>• Shapes can be composed from smaller shapes or decomposed into smaller shapes.</td><td>• Shapes can flip (reflect), turn (rotate), slide (translate), and be used to create patterns.</td><td>• A line of symmetry is the line that divides a shape or an object into two equal and symmetrical parts.
• Line symmetry is where one half of an object or shape is a mirror image of the other half, across a line of symmetry.</td><td></td><td>• Composing a compound shape using smaller shapes by trial and error, and decomposing a shape into smaller shapes</td><td>• Flipping, sliding, and turning 2D shapes to make a pattern or compose a shape</td><td>• Recognising lines of symmetry in patterns or pictures, and creating or completing symmetrical patterns or pictures</td></tr>
<tr><td rowspan="3">**Pathways**</td><td rowspan="2">• Spatial language can be used for giving and following instructions (e.g. near, far, next to, beside, on top, under, over, down, up, left, right, turn).</td><td rowspan="2">• The position of a location can be described relative to another location, including a known environmental feature.</td><td rowspan="2">• Paths can be described using sequenced instructions for moving or locating an object (e.g. for moving to another part of the school).</td><td rowspan="2">• Directions such as forward, left, and right depend on the orientation of the observer.</td><td colspan="2">• Following instructions to move to a familiar location or locate an object</td><td rowspan="2">• Following and giving instructions to move to a different location, using direction, distances (e.g. number of steps), and half and quarter turns</td><td rowspan="2">• Following and creating a sequence of step-by-step instructions for moving people or objects to a different location, including half and quarter turns and the distance to be travelled</td></tr>
<tr><td></td><td>• Using positional language to describe the position and movement of objects (e.g. above, below, left, right, in-front, behind, top, bottom, inside, outside, on, under, next to)</td></tr>
<tr><td></td><td colspan="2">• Maps are 2D representations of places in the world showing the view from above with symbols to show locations and landmarks.</td><td>• Cardinal directions are the four principal points of a magnetic compass: north, east, south, and west.</td><td></td><td>• Using pictures, diagrams, or stories to describe the positions of objects and places.</td><td>• Interpreting diagrams to describe the positions of objects and places in relation to other objects and places.</td><td>• Using simple maps to locate objects and places relative to other objects and places.</td></tr>
</table>

Statistics

<table>
<tr><th rowspan="2">Statistics</th><th colspan="4">Knowledge
The facts, concepts, principles, and theories to teach.</th><th colspan="4">Practices
The skills, strategies, and applications to teach.</th></tr>
<tr><th>During the first six months</th><th>During the first year</th><th>During the second year</th><th>During the third year</th><th>During the first six months</th><th>During the first year</th><th>During the second year</th><th>During the third year</th></tr>
<tr><td>**Developing knowledge from data**</td><td></td><td colspan="2">• Data is information collected about the world.
• A variable refers to an attribute being studied (e.g. colour, height, age of children).
• A categorical variable (e.g. colour, brand) classifies objects into groups (categories).
• Categorical data can be counted.</td><td>• A numerical variable in data is a number that is a measure or a count.</td><td></td><td>• Collecting categorical data for an investigative question with limited categories (e.g. Do students in our class have one foot longer than the other?)
• Recording data using tally charts</td><td>• Collecting categorical data for an investigative question with limited categories (e.g. What are the favourite pets of students in our class?)
• Sorting categorical data into categories and considering if “other” should be a category for sorting rare responses
• Recording data using tally charts</td><td>• Collecting categorical data and sorting the responses
• Collecting numerical data by asking an investigative question with a response that is a count or a discrete measurement (i.e. a whole number) (e.g. How many teeth have been lost by the students in our class? What are the shoe sizes in the class?)</td></tr>
<tr><td>**Visualisation of data**</td><td></td><td>• Data visualisations are representations (including picture graphs) of all available values for a variable that show the frequency for each value.
• Picture graphs use a consistent image for each value; across the categories each image has the same height (for a vertical chart).</td><td>• Data visualisations are representations (including picture graphs and dot plots) of all available values for a variable that show the frequency for each value.
• Dot plots represent each data point with a dot of the same size.</td><td>• Data visualisations are representations (including dot plots and bar graphs) of all available values for a variable that show the frequency for each value.
• In a bar graph, each bar corresponds to a category or number, and the height of the bar (for a vertical chart) or the length (for a horizontal chart) directly corresponds to the frequency of the category or number.</td><td></td><td>• Creating picture graphs for categorical data</td><td>• Creating data visualisations for categorical data</td><td>• Creating data visualisations for categorical and numerical data</td></tr>
<tr><td>**Interpretation of data**</td><td></td><td colspan="3">• Data visualisations are representations that help reveal the story of a set of data.</td><td></td><td>• Describing a picture graph by giving the frequency for each category
• Answering questions about a picture graph, including which category has the most or least items</td><td>• Describing data visualisations using the variable name and the context and giving the frequency for each category
• Answering questions about data visualisations, including which category has the most or least items</td><td>• Describing data visualisations using the variable name and the context and giving the frequency for each category or number
• Answering questions about data visualisations, including which category has the most or least items and questions involving operations (e.g. How many teeth did our class lose in total?)</td></tr>
</table>

The language of Mathematics and Statistics for Phase 1 (Years 0–3)

	At six months *Students will be taught the following new words:*	**Year 1** *Students will be taught the following new words:*	**Year 2** *Students will be taught the following new words:*	**Year 3** *Students will be taught the following new words:*
Number	• 1st, 2nd, 3rd, 4th, 5th • add, plus, join • between • combine • compare, order • count • group • how many, total, all together • largest, smallest • more, less • next, before, after • number line • pair • subtract, separate, take away, minus • same	• digit • equal group • equal part • forwards, backwards • fraction, half, quarter, whole • set • sum, difference • tally	• cent, coin, dollar, note • denominator • double, halve, third • estimate, estimation • even, odd • money • multiply, divide • numerator • place value • round (a number) • skip count • quantity, amount • times • whole set	• change • equivalent fraction • fifth, sixth, eighth • renaming • unit fraction
Algebra	• continue • copy • pattern • repeat	• changed, unchanged • element • equal, • number sentence • repeating pattern • true, false • unit of repeat	• greater than, less than • predict	• complete, incomplete • growing pattern • rule • sequence • visualize
Measurement	• comparative and superlative words (long, taller, heaviest etc.) • days of the week, weekend • full, empty • heavy, light • height	• analogue, digital • tomorrow, yesterday, next, last • capacity • day, week, month, year • distance	• anti-clockwise, clockwise • full turn, half turn, quarter turn • half past • months of the year • polygon	• a.m, p.m • area • decade, century, millennia • gram • litre, millilitre

	At six months *Students will be taught the following new words:*	**Year 1** *Students will be taught the following new words:*	**Year 2** *Students will be taught the following new words:*	**Year 3** *Students will be taught the following new words:*
	• high, low • length • measure, weigh • same as • short, tall, wide, large, small, big • weight	• distant, far, near, close • earlier, later • heavier, longer, shorter • hour, minute, second • morning, midday, noon, afternoon, evening, midnight • o'clock • starting point, end point	• seasons of the year • shallow, deep, depth, width • surface • turn	• measuring jug or cup • metre, centimetre • metric • leap year • perimeter • quarter past, quarter to • ruler • three-quarter turn • unit • volume • weighing scale, balance scale
Geometry	• flip • positional language (beside, next to, above, below, under, up, down, on top of, inside, outside, in front of, behind.) • line • side, corner • size (big, small, long, short) • square, triangle, circle • straight, curved, round • turn	• 2D shape • 3D or solid shape • cube, cylinder, sphere • map • middle, centre • slide • rectangle	• angle • direction • edge, face, vertex • left, right • oval, semicircle, polygon (hexagon, pentagon), rectangular prism (cuboid), pyramid, cone • position	• horizontal, vertical • location • north, east, south, west • reflect, reflection • regular • right angle • rotate, rotation • symmetry, line of symmetry • transform, transformation • translate, translation
Statistics		• category • data, data visualisation • frequency • most, least • picture graph • variable, numerical, categorical	• dot plot	• bar graph • context

Phase 2 (Years 4–6) teaching sequence

Number

<table>
<tr><th rowspan="2">Number</th><th colspan="3">Knowledge
The facts, concepts, principles, and theories to teach.</th><th colspan="3">Practices
The skills, strategies, and applications to teach.</th></tr>
<tr><th>During Year 4</th><th>During Year 5</th><th>During Year 6</th><th>During Year 4</th><th>During Year 5</th><th>During Year 6</th></tr>
<tr><td rowspan="4">Number structures</td>
<td>Whole numbers can be represented in the base 10 number system, where each digit has a place value 10 times that of the digit on the right.
Each digit’s value depends both on its position (e.g. the tens position) and the numeral in the position. Zero is used as a placeholder.</td>
<td>The base 10 number system extends to millions (1,000,000).
Factors are whole numbers that divide another number exactly.
Factor pairs are two whole numbers that multiply together to give another whole number (e.g. 3 and 4 are a factor pair of 12).</td>
<td>The base 10 number system extends infinitely in two directions.</td>
<td>Reading, writing, comparing, and ordering whole numbers up to 10,000 and representing them using base 10 structure</td>
<td>Reading, writing, comparing, and ordering whole numbers up to 1,000,000 and representing them using base 10 structure
Finding factor pairs for numbers that result from multiplying any two whole numbers between 1 and 10</td>
<td>Reading, writing, comparing, and ordering any whole number and representing them using base 10 structure
Finding factor pairs for numbers that result from multiplying any two whole numbers between 1 and 12</td></tr>
<tr><td colspan="3">Rounding can support predicting or estimating the result of a calculation.
Rounding is based on identifying the nearest place value or unit (ten, hundred, thousand) for a given number; a number line supports this.</td>
<td>Rounding whole numbers to the nearest thousand, hundred, or ten
Rounding tenths to the nearest whole number</td>
<td>Rounding whole numbers to the nearest hundred thousand, ten thousand, thousand, hundred, or ten
Rounding tenths or hundredths to the nearest whole number</td>
<td>Rounding whole numbers to the nearest million, hundred thousand, ten thousand, thousand, hundred, or ten
Rounding hundredths to the nearest whole number or tenth</td></tr>
<tr><td rowspan="2"></td><td></td>
<td>Square numbers are produced by multiplying a number by itself.
Cube numbers are produced by multiplying a number by itself twice (e.g. 4 x 4 x 4).</td>
<td></td><td></td>
<td>Recognising square and cube numbers and the notation for squared (^{2}) and cubed (^{3})
Memorising the square numbers to 144 and cube numbers to 125</td></tr>
<tr><td colspan="2">Negative numbers are to the left of 0 on a horizontal number line and below 0 on a vertical number line.
Negative numbers are represented symbolically with a negative sign (−) and named ‘negative’ along with the numeral (e.g. -4 is named negative four).
Zero is neither positive nor negative.
Negative numbers arise in a range of situations (e.g. debt, temperature).</td>
<td>Counting forwards and backwards in 2s, 3s, 4s, 5s, 6s, 7s, 8s, 9s, 25s, and 50s from multiples of the counting unit
Counting in 10s, 100s, and 1,000s from any whole number up to 10,000</td>
<td>Counting forwards and backwards in 11s and 12s from multiples of the counting unit
Counting in 1,000s, 10,000s, and 100,000s from any whole number up to 100,000
Counting backwards through 0 to include negative whole numbers</td>
<td>Counting forwards and backwards with positive whole numbers, including working with negative numbers (e.g. starting at -6 and counting backwards in 2s)</td></tr>
<tr><td rowspan="3">Operations</td><td></td><td></td>
<td>In expressions that have more than one operation, the order of operations is important; operations are done as follows:
operations grouped inside brackets
exponents such as squaring
multiplication and division, from left to right
addition and subtraction, from left to right.</td>
<td></td><td></td>
<td>Calculating expressions using the order of operations</td></tr>
<tr><td colspan="3">Addition and subtraction can be carried out mentally, using known facts, place value and partitioning, or column methods.
Standard written algorithms (e.g. column addition, column subtraction) rely on place value, regrouping, and renaming.</td>
<td>Adding and subtracting up to four-digit numbers</td>
<td>Adding and subtracting increasingly large whole numbers</td>
<td>Adding and subtracting any whole numbers</td></tr>
<tr><td>Multiplication can be represented as repeated addition, scaling, or arrays, and larger numbers can be multiplied using an area model or column multiplication.</td>
<td>Division may result in a whole number quotient or a quotient with a remainder, represented as a whole number.
Division can be represented as grouping, sharing, or an area model and larger numbers can be divided using a standard written algorithm, where appropriate.</td>
<td>Remainders from division can be represented as whole numbers, fractions, or decimals, depending on the context.</td>
<td>Memorising multiplication and corresponding division facts for 2s to 10s
Using place value and known and derived facts to multiply and divide mentally, including multiplying by 0 and 1 and dividing by 1
Multiplying two-digit and three-digit numbers by a one-digit number</td>
<td>Memorising multiplication and corresponding division facts for 2s to 12s
Applying mental strategies, number facts, derived facts, factor pairs, and multiples to multiply and divide increasingly large numbers</td>
<td>Multiplying any whole number by a two-digit number (e.g. 542×12)
Dividing up to five-digit whole numbers by a one-digit divisor, with a remainder (e.g. $1283 \div 5 = 256$, remainder 3)
Connecting finding unit fractions of whole numbers to division (with</td></tr>
</table>

Number	Knowledge *The facts, concepts, principles, and theories to teach.*			Practices *The skills, strategies, and applications to teach.*		
	During Year 4	**During Year 5**	**During Year 6**	**During Year 4**	**During Year 5**	**During Year 6**
		• Standard written algorithms for multiplication and division rely on place value, regrouping, and renaming.		• Dividing up to a three-digit whole number by a one-digit divisor, with no remainder (e.g. $65 \div 5$)	• Multiplying three-digit and four-digit numbers by a one-digit number and multiplying two two-digit numbers • Dividing up to four-digit whole numbers by a one-digit divisor, with a remainder (e.g. $278 \div 4 = 69$ remainder 2)	remainders) (e.g. $\frac{1}{6}$ of 31 is equivalent to $31 \div 6 = 5\frac{1}{6}$) • Representing remainders from division as whole numbers, fractions, or rounded decimals, as appropriate to the context
Rational numbers	• The base 10 number system continues past the ones column, to the right, to create decimals such as tenths. • Decimals are fractions that have powers of 10 as their denominators, and they can be written as numbers using a decimal point. • A decimal point marks the column immediately to the right of the ones column as the tenths column. • Tenths can be created by dividing whole numbers by 10 and can be expressed as fractions or decimals. • Improper fractions and mixed numbers are different representations of the same quantity.	• Hundredths can be created by dividing whole numbers by 100 and can be expressed as fractions or decimals. • Equivalent fractions can be generated using common factors. • Percentages are decimal fractions with denominators of 100; they are represented using the percent (%) symbol.	• Thousandths can be created by dividing whole numbers by 1,000 and can be expressed as fractions or decimals. • Equivalent fractions can be generated and simplified using common factors. • Percentages can be used to compare quantities to a value or whole.	• Reading, writing, and representing tenths as fractions and decimals • Comparing and ordering tenths as fractions and decimals • Memorising and using the decimal equivalent of $\frac{1}{2}$ and fractions with denominators of 10 • Dividing one- and two-digit whole numbers by 10 to make decimals and identify tenths • Multiplying decimal tenths by 10 • Comparing and ordering fractions with the same numerator or same denominator • Relating fractions, improper fractions, and mixed numbers to their position on a number line • Identifying when two fractions are equivalent, using representations	• Reading, writing, and representing tenths and hundredths as fractions and decimals • Comparing tenths or hundredths as fractions and decimals • Comparing and ordering numbers with up to two decimal places (e.g. $0.12 < 0.2,\ 3.55 < 3.84$) • Memorising and using decimal equivalents of $\frac{1}{2}, \frac{1}{4},$ and $\frac{3}{4}$ and fractions with denominators or 10 or 100 • Converting common percentages (10%, 25%, 50%) to fractions and decimals • Dividing one-, and two-digit whole numbers by 10 or 100 to make decimals and identify tenths and hundredths places • Multiplying numbers with up to two decimal places by 10 and 100 • Comparing fractions where one denominator is a multiple of the other • Recognising families of equivalent fractions • Recognising equivalent mixed numbers and improper fractions	• Reading, writing, and representing tenths, hundredths, and thousandths as fractions and decimals • Comparing and ordering numbers with up to three decimal places • Memorising decimal and percentage equivalents of common fractions ($\frac{1}{2}, \frac{1}{4}, \frac{3}{4}, \frac{1}{5}, \frac{2}{5}, \frac{3}{5}, \frac{4}{5}$) including fractions with denominators that are 10 or 100 • Converting decimal tenths and hundredths to fractions and percentages (e.g. $0.31 = \frac{31}{100} = 31\%$) • Multiplying and dividing numbers by 10, 100, or 1,000 to make decimals and whole numbers (e.g. $1.3 \times 10 = 13$) and to identify tenths, hundredths, and thousandths places • Finding equivalent fractions • Comparing and ordering fractions where at least one denominator is a common multiple of all the others • Converting between mixed numbers and improper fractions
	• Addition and subtraction of fractions with the same denominator follow the same principles as whole numbers and can result in improper fractions or whole numbers.	• Fractions should have the same denominator before using them in addition or subtraction.		• Adding and subtracting fractions with the same denominators, including beyond a whole (e.g. $\frac{3}{8} + \frac{3}{8} + \frac{3}{8} = \frac{9}{8} = 1\frac{1}{8}$) • Adding and subtracting decimals to one decimal place (e.g. 1.3 + 0.2 = 1.5)	• Adding and subtracting fractions with the same denominator or when one denominator is a multiple of the other, including improper fractions (e.g. $\frac{2}{3} + \frac{1}{9} = \frac{7}{9}$) • Adding and subtracting decimals to two decimal places (e.g. $1.31 + 0.22 = 1.53$)	• Adding and subtracting fractions and mixed numbers when one denominator is a multiple of the other • Adding and subtracting decimals to three decimal places
	• Scaling changes quantities proportionally, using multiplication and division.	• Multiplication, division, fractions, decimals, and percentages can be used to solve problems involving relative quantities and measures.		• Using known multiplication and division facts to scale a quantity (e.g. to double or halve a recipe) • Finding a unit fraction of a whole number, using multiplication and division facts and where the answer is a whole number (e.g. $\frac{1}{3}$ of 300) • Finding the whole set or amount when given a unit fraction, using multiplication and division facts (e.g. $\frac{1}{4}$ of a set is 7, what is the whole set?)	• Finding a non-unit fraction of a whole number, using multiplication and division facts and where the answer is a whole number (e.g. $\frac{2}{3}$ of 24) • Finding a whole set from a fractional part of the set (e.g. if 8 is $\frac{2}{5}$ of a set, what is the whole set?) • Finding common percentages (10%, 25%, 50%) of whole numbers • Finding the whole (100%) when given 25% or 50%	• Finding a non-unit fraction of a whole number, using multiplication and division facts and where the answer is a whole number (e.g. $\frac{2}{3}$ of 240) • Finding a whole set or amount when given a non-unit fraction, using multiplication and division facts (e.g. $\frac{3}{4}$ of the set is 90, what is the whole set?)

Number	Knowledge *The facts, concepts, principles, and theories to teach.*			Practices *The skills, strategies, and applications to teach.*		
	During Year 4	**During Year 5**	**During Year 6**	**During Year 4**	**During Year 5**	**During Year 6**
						• Finding common percentages (1%, 10%, 20%, 25%, 50%, 75%) of whole numbers • Finding the whole (100%) when given a percentage (e.g. 75% is 24) • Reasoning proportionally with fractions, decimals, and percentages to compare two quantities and determine missing values
Financial mathematics	• New Zealand currency is a decimal system of dollars made up of 100 cents.	• Money uses our decimal place-value system to two decimal places.		• Calculating the total cost of several items costing whole-dollar amounts and with different prices, or of multiples of the same item, including giving change • Representing amounts of currency using different combinations of denominations (e.g. making \$5 and 80 cents in multiple ways using play money)	• Calculating the total cost of items costing dollars and cents and the change from the nearest ten dollars • Representing currency values of mixed dollars and cents using decimal notation • Rounding money amounts to the nearest dollar	• Calculating 10%, 25%, and 50% of whole dollar amounts (e.g. 50% of \$280) • Investigating questions involving purchases (e.g. ensuring there's enough money)

Algebra

Algebra	Knowledge *The facts, concepts, principles, and theories to teach.*			Practices *The skills, strategies, and applications to teach.*		
	During Year 4	**During Year 5**	**During Year 6**	**During Year 4**	**During Year 5**	**During Year 6**
Equations and relationships	• Numbers can be compared using "greater than" (>), "less than" (<), and equals (=). • Applying the same operation to both sides of a number sentence preserves the balance.	• The relative size of expressions involving numbers can be communicated using "greater than" (>), "less than" (<), and equals (=).	• Inequalities can also include 'or equal to' (≤, ≥) to show a relationship that allows for the possibility of equality.	• Checking the truth of number sentences and completing open number sentences involving addition and subtraction (e.g. $8205 - 4721 = 3484$, true or false?; $4200 - \_ = 4001$) • Checking the truth of number sentences and completing open number sentences involving multiplication and division (e.g. $11 \times 7 = 78$, true or false?; $\_ \div 10 = 12$).	• Completing number sentences that involve addition and subtraction by using equality (=) and inequality (<, >) symbols (e.g. $2{,}456 + 203{,}938 \quad 3{,}456 + 231{,}930$; $2{,}456 \times 2 \quad 1{,}228 \times 4$) • Checking the truth of number sentences and completing open number sentences (e.g. $999{,}999 - \_ = 899{,}999$)	• Checking the truth of and completing open number sentences that involve all four operations and that include the use of inequalities, respecting the order of operations (e.g. $8 \times 7 \leq 8 \times 5 + 4^2$, true or false?)
	• Growing patterns can increase or decrease by the addition or subtraction of a constant (arithmetically) or multiplication or division by a constant (geometrically).		• Tables provide a way of organising the positions and elements of a pattern to reveal relationships or rules. • A coordinate plane is formed when two perpendicular number lines intersect at (0, 0); usually the coordinate plane consists of a horizontal *x*-axis and a vertical *y*-axis. • Coordinates are represented as (x, y), where the x-value represents horizontal movement and the y-value represents vertical movement. Plotting points on a coordinate plane can help to visualise numeric patterns.	• Recognising, continuing, creating, and describing growing patterns (including numerical and non-numerical patterns) that change by adding, subtracting, or multiplying by a constant whole number (e.g. $5, 7, 9, 11, \ldots$; $3, 6, 12, 24, \ldots$)	• Recognising, continuing, creating, and describing growing patterns that change by a constant amount (e.g. 3, 4.5, 6, 7.5 ...)	• Developing a rule for a growing pattern in words and making conjectures about further elements in the pattern • Locating coordinate points on a coordinate plane, including points found on the x- or y-axis • Generating a table of values from a rule for a growing pattern and plotting these points on a coordinate plane

Measurement

Measurement	Knowledge *The facts, concepts, principles, and theories to teach.*			Practices *The skills, strategies, and applications to teach.*		
	During Year 4	**During Year 5**	**During Year 6**	**During Year 4**	**During Year 5**	**During Year 6**
Measuring	• Different measurement tools and scales use different-sized units; the unit must be recorded with the measurement amount.		• Measurements can be approximated by referencing previously measured benchmark lengths, volumes, or areas.	• Using familiar objects (e.g. body parts) and experiences (e.g. time taken to travel to school, the temperature outside) to create estimation benchmarks • Using the appropriate tool for measuring length, mass (weight), and capacity in mixed units (e.g. 1 m and 23 cm, 10 kg and 3 g, 2 L and 500 mL) • Measuring temperature in degrees Celsius	• Accurately measuring length with a ruler, mass (weight) with scales, capacity with measuring jugs, temperature with a thermometer, and duration with a timer, using appropriate metric or time-based units or a combination of units (e.g. 2 hours and 30 minutes)	
						• Estimating (using benchmarks) length, mass (weight), capacity, temperature, and duration, using appropriate metric or time-based units or a combination of units
		• Measurements can be communicated using mixed or decimal units. • There are 1000 millimetres in a metre, 10 millimetres in a centimetre, 100 centimetres in a metre, and 1000 metres in a kilometre.	• Prefixes are added to base metric units to signify larger or smaller quantities. The prefix: ○ 'milli–' (m) signifies a unit one thousand times smaller than the base unit ○ 'centi–' (c) signifies a unit one hundred times smaller than the base unit ○ 'kilo–' (k) signifies a unit one thousand times larger than the base unit. • Converting between metric units can involve multiplying and dividing by 10, 100, or 1000.		• Converting metric units of length (m and cm)	• Converting metric units of length (m and cm), mass (g and kg), and capacity (L and mL), including combining mixed units to produce units with up to 2 decimal places (e.g. 10 kg and 500 g = 10.5 kg)
	• Volume is a measure of regions in three-dimensional space. • The areas of rectangles (including squares) can be calculated by multiplication of side lengths.		• The area of a right-angled triangle is equal to half the area of a rectangle with the same base and height. • The volumes of rectangular prisms can be calculated by multiplication of side lengths.	• Measuring the perimeter of polygons using metric units (mm, cm, and m) • Measuring the areas of irregular shapes covered with squares and half squares • Calculating the areas of rectangular figures (including squares) using multiplication of side lengths • Measuring the volumes of rectangular prisms (cuboids) by filling them with identical 3D blocks	• Approximating the areas of irregular shapes covered with squares, half squares, and partial squares • Calculating the areas of rectangles (including squares) using multiplication of side lengths • Measuring the volumes of rectangular prisms (cuboids) filled with centicubes by determining the number of cubes in each layer and then multiplying by the number of total layers • Calculating the perimeters of regular polygons and other 2D shapes with straight sides • Recognising that shapes with the same area can have different perimeters, and vice versa	• Calculating, estimating, and comparing the volumes of cubes and rectangular prisms using standard units, including cubic centimetres (cm^3) and cubic metres (m^3) • Visualising, estimating, and calculating (using multiplication) the areas of rectangles and right-angled triangles (in cm^2 and m^2) and the volumes of rectangular prisms (in cm^3)

Measurement	Knowledge *The facts, concepts, principles, and theories to teach.*			Practices *The skills, strategies, and applications to teach.*		
	During Year 4	**During Year 5**	**During Year 6**	**During Year 4**	**During Year 5**	**During Year 6**
	• Angles are a measure of turn and can be measured using the unit of degrees; a full turn is 360 degrees, a half turn is 180 degrees, and a quarter turn is 90 degrees. • Rectangles and squares have four right angles.	• Angle classification can aid the estimation of angle size. • Angles are classified with reference to the benchmark angles of 90°, 180°, and 360°. o Acute angles are less than 90°. o Right angles are exactly 90°. o Obtuse angles are more than 90° and less than 180°. o Reflex angles are more than 180° and less than 360°.	• Angles at a point sum to 360°. • Angles on a straight line sum to 180°. • Vertically opposite angles are equal.	• Estimating the size of angles by comparing them to 90, 180, and 360 degrees	• Describing and classifying angles and turns using the terms acute, right, obtuse, straight, and reflex • Classifying and constructing angles up to 180°, using a protractor	• Classifying, measuring, and constructing angles up to 360°, using a protractor • Identifying and describing angles at a point, angles on a straight line, and vertically opposite angles, using angle notation • Reasoning about and finding unknown angles in situations involving angles at a point, angles on a straight line, and vertically opposite angles
	• A point in time is typically measured in hours and minutes past midnight. • Clocks relate seconds to minutes and minutes to hours according to a system based on 60.		• Time and duration arise in a range of situations including solar calendars (e.g. Roman, Gregorian) and lunar calendars (e.g. maramataka Māori, Chinese). • Timetables can be used to record the time and duration of events.	• Telling the time on analogue and digital clocks to the nearest minute • Measuring duration in hours, minutes, and seconds, including mixed time units (e.g. 1h and 42mins, 3mins and 21s) • Finding equivalent durations of time using different units (e.g. 3 weeks is 21 days; 90 seconds = 1.5 minutes; 48 hours = 2 days)	• Telling the time on analogue and digital clocks • Finding the duration of periods of time involving a.m. and p.m. notation and 24-hour time	• Converting between units of time (h, min, s) • Measuring duration in both 12- and 24-hour time systems • Finding elapsed time in minutes across an hour (e.g. the difference between 2:53 pm and 3:28 pm) • Using and interpreting timetables to calculate the duration of events (e.g. bus and train schedules)

Geometry

<table>
<tr><th rowspan="2">Geometry</th><th colspan="3">Knowledge
The facts, concepts, principles, and theories to teach.</th><th colspan="3">Practices
The skills, strategies, and applications to teach.</th></tr>
<tr><th>During Year 4</th><th>During Year 5</th><th>During Year 6</th><th>During Year 4</th><th>During Year 5</th><th>During Year 6</th></tr>
<tr><td>**Shapes**</td><td>• A regular polygon is a two-dimensional shape with all sides of equal length and all interior angles of equal measure.
• Circles have an infinite number of lines of symmetry.</td><td>• Parallel lines are always the same distance apart and never meet.
• Perpendicular lines intersect at right angles (90°).
• A prism is a 3D shape with two identical, parallel ends and flat faces.</td><td>• Quadrilaterals can be categorised into one or more of the following categories:
○ a trapezium, which has one pair of parallel sides
○ a parallelogram, which has two pairs of parallel sides
○ a kite, which has two pairs of equal-length adjacent sides
○ a rectangle, which has four right angles
○ a rhombus, which has four equal-length sides
○ a square, which has four right-angles and four equal-length sides.
• The order of rotational symmetry for a given shape is the number of times it appears in an identical orientation when completing a full turn (360°).
• The order of rotational symmetry for a circle is infinite.</td><td>• Identifying, classifying, and describing the attributes of regular and irregular polygons of up to 12 sides, using edges, vertices, and angles
• Identifying the number of lines of symmetry in 2D shapes</td><td>• Identifying, classifying, and describing the attributes of prisms, using cross sections, faces, edges, and vertices
• Identifying parallel and perpendicular lines, including those forming the sides of polygons</td><td>• Identifying, classifying, and explaining similarities and differences between 2D shapes (including different types of triangles and quadrilaterals) and between prisms and pyramids
• Identifying and describing the interior angles of triangles and quadrilaterals
• Identifying shapes with rotational symmetry and determining their order of rotational symmetry</td></tr>
<tr><td rowspan="2">**Spatial reasoning**</td><td>• Shapes may appear different when viewed from a different perspective.</td><td>• A net is a 2D representation of the surfaces of a 3D unfolded shape.</td><td>• A tessellation is a pattern made from a repeated shape or combination of shapes that can be rotated or reflected to fit together with no gaps or overlaps.</td><td>• Visualising 3D shapes and connecting them with 2D diagrams, verbal descriptions, and the same shapes drawn from different perspectives</td><td>• Connecting 3D shapes with nets</td><td>• Visualising, creating, and describing 2D geometric patterns and tessellations using rotation, reflection, and translation, and identifying the properties of the shapes that do not change</td></tr>
<tr><td colspan="3">• A reflection is when a shape is flipped over a line, creating a mirror image.
• A translation is when a shape is slid from one place to another without being turned.
• A rotation is when a shape is turned around a fixed point.</td><td>• Performing one-step transformations (reflections, translations, rotations) on 2D shapes</td><td>• Describing the transformations performed (reflections, translations, rotations) on 2D shapes</td><td>• Predicting the results of two-step transformations (reflections, translations, rotations) on 2D shapes</td></tr>
<tr><td>**Pathways**</td><td colspan="3">• An alphanumeric grid reference is a system that divides a map into labelled rows (letters) and columns (numbers), so that each square can be identified by combining a letter and a number (e.g. A1, B2).</td><td>• Using alphanumeric and general grid references to identify regions and plot positions on a grid map</td><td>• Interpreting and creating grid maps to plot positions and pathways, using grid references and directional language, including the four main compass points</td><td>• Interpreting and creating grid references and simple scales on maps, using directional language including the four main compass points, turn (in degrees), and distance (in m, km) to locate and describe positions and pathways</td></tr>
</table>

Statistics

Statistics	Knowledge *The facts, concepts, principles, and theories to teach.*			Practices *The skills, strategies, and applications to teach.*		
	During Year 4	**During Year 5**	**During Year 6**	**During Year 4**	**During Year 5**	**During Year 6**
Developing knowledge from data	• A variable is an attribute or measurement of the people or objects being studied: ○ categorical variables classify objects or individuals into groups ○ discrete numerical variables are counted ○ continuous numerical variables are measured.	• Measurements for continuous numerical data need to have the place value for rounding specified (e.g. to the nearest centimetre). • Bivariate data is data in a set that has two variables for each subject (e.g. dislikes and gender for each student).	• Bivariate data includes time-series data with two numerical values, one time-based. • The answers to a statistical investigative question will vary for different subjects. • The mean (average) measures the centre of numerical data. The mean is the sum of all the values divided by the total number of values. • The range measures the spread of numerical data. The range is the difference between the highest and lowest values.	• Collecting numerical data, and, if needed, rounding to an appropriate unit or part of a unit, based on the context (e.g. How many skips can we do in 30 seconds? How long does it take us to run 1000 m?)	• Collecting continuous numerical data by taking measurements, and then applying specified rounding rules • Collecting bivariate data with two categorical variables (e.g. what students in our class do at lunch time, and their gender)	• Collecting time-series data (e.g. how the mass of a kilogram of carrots varies over 5 days) • Calculating the mean for numerical data • Calculating the range for numerical data
Visualisation of data	• Data visualisations are representations of all available values for a variable showing the frequency for each value. • Data visualisations show patterns, trends, and variations. • Numerical data can be visualised with dot plots or bar graphs. • A good data visualisation includes, where appropriate: ○ a title that gives the purpose of the visualisation ○ variable(s) (e.g. labelled on the axis) ○ the group the data is from ○ units for a numerical variable ○ values or categories ○ frequency, with the scale starting at 0.	• Continuous numerical data can be organised in a table by grouping data into specific ranges of values. • Paired categorical data can be visualised with a clustered bar graph; one variable is represented on the horizontal axis, the other variable is shown by coloured bars clustered side-by-side, and the colours are explained in a key.	• Time-series data can be visualised with a time-series or line graph formed on a coordinate plane, with the x-axis representing time and the y-axis the second variable.	• Creating dot-plot or bar-graph data visualisations	• Creating tables for continuous numerical data, using groupings (e.g. 0–0.99, 1–1.99, 2–2.99) • Creating clustered bar graphs for paired categorical data	• Creating time-series graphs • Choosing and creating an appropriate data visualisation for a given set of data
Interpretation of data	• Interpreting a data visualisation includes describing its variables and their units, the context for the data, and the visualisation's key features: ○ its shape (e.g. the number of peaks) ○ its middle group(s) (where the middle of the data lies) ○ its spread (how spread the data is from the minimum (lowest) value to the maximum (highest) value).			• Answering questions about the frequency of a particular value in dot plots • Answering questions about individual values in a dot plot, while referring to the context • Interpreting data visualisations • Distinguishing between when to use a particular value or the frequency for a given value when answering questions about dot plots (e.g. How many pets does the person with the most pets have? What's the most common number of pets that anyone has?)	• Answering questions about the frequency of particular values or groups of values from a table for continuous numerical data • Answering questions about bivariate data in which a specific category in one variable appears more frequently than a specific category in another variable • Interpreting data visualisations	• Identifying whether a time-series graph shows a trend • Calculating an average and a range for continuous numerical data • Interpreting data visualisations, including those from contemporary media

Probability

Probability	**Knowledge** *The facts, concepts, principles, and theories to teach.*			**Practices** *The skills, strategies, and applications to teach.*		
	During Year 4	**During Year 5**	**During Year 6**	**During Year 4**	**During Year 5**	**During Year 6**
Experimental probability		• Situations that involve chance, uncertainty, and randomness are called chance-based situations. Probability can be used to describe such situations. • A trial is a single run of a chance-based situation that results in one of a set of possible outcomes. • The possible outcomes for a chance-based situation can be arranged into events. • The probability of an outcome is the chance of it occurring. • Probabilities are associated with values between 0 and 1, where: ○ 0 is impossible ○ between 0 and 0.5 or $\frac{1}{2}$ ranges from very unlikely to unlikely ○ 0.5 or $\frac{1}{2}$ is equally likely ○ between 0.5 or $\frac{1}{2}$ and 1 range from likely to very likely ○ 1 is certain. • Likelihood can be visualised using a number line from 0 to 1. • The sample space is the set of all possible outcomes of an experiment. • The probability of an event, if events are believed to be equally likely, is the number of ways the event can happen divided by the total number of possible outcomes. ○ The sum of the probabilities of all outcomes is equal to 1.			• Conducting repeated chance experiments or games, identifying the outcomes, and describing differences between them using likelihood vocabulary • Identifying the likelihood of an everyday event as being impossible, unlikely, even-chance, likely, or certain (e.g. the event 'the sun will rise tomorrow' is certain) • Placing everyday events on a number line according to their likelihood (e.g. placing the event 'you will eat something later today' between $\frac{1}{2}$ and 1 as 'likely' or 'very likely')	• Listing the sample space of an event (e.g. the sample space for rolling a die is 1, 2, 3, 4, 5, 6) • Calculating the probabilities of individual outcomes • Calculating probabilities using a spinner, where each event is a fraction or combination of fractions on the spinner • Answering questions about the probability of combinations of outcomes, including checking that the sum of all the probabilities is 1

The language of Mathematics and Statistics for Phase 2 (Years 4–6)

	Year 4 *Students will be taught the following new words:*	**Year 5** *Students will be taught the following new words:*	**Year 6** *Students will be taught the following new words:*
Number	• approximate • convert • decimal • decimal place • decimal point • infinite • inverse operation • improper fraction • mixed number • multiple • rename • scale • simplest form • tenth	• change • divisor, dividend, quotient, remainder • factor • hundredth • multiple • negative, positive • non-unit fraction • percentage • product • proportion • remainder	• brackets • efficient • simplest form • square number, cube number • systematically • thousandth
Algebra	• conjecture • equation • relationship	• corresponding element • equality	• constant (amount of change) • coordinate plane, XY graph, x-axis, y-axis • inequality • ordered pairs
Measurement	• angle • benchmark • centi–, kilo– • degree (of angle) • degrees Celsius • kilogram • irregular • minutes past, minutes to • right angle • temperature	• attribute • deci–, milli– • kilometre, millimetre • acute angle, obtuse, reflex, right, or straight angle • timetable	• cubic centimetre (cm^3), cubic metre (m^3) • protractor • square centimetre (cm^2), square metre (m^2)

	Year 4 *Students will be taught the following new words:*	**Year 5** *Students will be taught the following new words:*	**Year 6** *Students will be taught the following new words:*
Geometry	• diagonal, horizontal, vertical • grid reference • parallel line • perspective • quadrilateral • rotation. • transformation	• cross section • net • perpendicular line • prism	• angles at a point, on a straight line, vertically opposite angles • interior angle • kite, parallelogram, rhombus, trapezium • map scale • right-angled triangle • rotational symmetry • tessellation
Statistics	• discrete numerical, continuous numerical • interpreting • spread • trends • variation	• bivariate data • paired categorical data • clustered bar graph	• mean • range • time-series data
Probability		• chance, uncertainty • chance-based investigation • equally likely outcome • evaluate • event	• experiment • impossible, unlikely, evenly likely, likely, certain • outcome • sample space

Phase 3 (Years 7–8) teaching sequence

Number

Number	Knowledge *The facts, concepts, principles, and theories to teach.*		Practices *The skills, strategies, and applications to teach.*	
	During Year 7	**During Year 8**	**During Year 7**	**During Year 8**
Number structures and operations	• In our number system each place value is a power of 10, and this continues infinitely. • Repeated multiplication can be expressed using exponent notation with positive exponents. • An exponent means 'raising to the power of' (e.g. 5^2 is 5 raised to the power of 2 or 5 to the second power). • Expanded form uses powers of 10 to indicate place value.	• In our number system, each place value is a power of 10, and this continues infinitely to the left and right. • Repeated division can be expressed using exponent notation with negative exponents. • Decimals can be represented using negative exponents (i.e. negative powers of ten).	• Reading, writing comparing, and ordering whole numbers using powers of 10 (e.g. $10{,}000 = 10^4, 1000 < 10^4$) • Representing numbers in expanded form using powers of 10 (e.g. $34{,}506 = 3 \times 10^4 + 4 \times 10^3 + 5 \times 10^2 + 6$)	• Reading, writing comparing, and ordering whole numbers and decimals using positive and negative powers of 10 • Representing whole numbers and decimals in expanded form using powers of 10 (e.g. $3.61 = 3 \times 10^0 + 6 \times 10^{-1} + 1 \times 10^{-2}$) • Representing negative powers of 10 as a fraction and a decimal, and vice-versa (e.g. $0.01 = \frac{1}{100} = 10^{-2}$)

	• Whole numbers greater than zero are either prime, composite, or the number 1.
	  ○ A prime number has exactly two distinct factors: 1 and the number itself.
	  ○ A composite number has more than two distinct factors.
	  ○ 1 is neither prime nor composite.
	• The highest common factor (HCF) of two numbers is the greatest number that is a factor of both the numbers.
	• The least common multiple (LCM) of two numbers is the smallest number that they are both factors of.
		• Each composite number can be represented as a unique product of prime factors and summarised with exponent notation.	• Using exponents and identifying square roots for square numbers up to at least 144
			• Using radicals ($\sqrt{}$) to represent square roots
			• Using divisibility rules to identify numbers that are divisible by 2, 3, 4, 5, 6, 8, 9, and 10
			• Identifying prime numbers to 100
			• Finding the highest common factor (HCF) of two numbers under 100, and finding the least common multiple (LCM) of two numbers under 10
				• Using exponents and identifying cube roots for cube numbers up to at least 125
				• Using radicals ($\sqrt{}$ and $\sqrt[3]{}$) to represent square and cube roots
				• Evaluating square and cube roots for perfect squares and cubes and using a calculator to approximate them for other numbers
				• Representing composite numbers as products of their prime factors, using exponents to summarise repeated factors (e.g. $36 = 2 \times 2 \times 3 \times 3 = 2^2 \times 3^2$)

	• The number system extends infinitely, including into negative numbers, and can be represented with a number line. • Integers are all the whole numbers, including positive whole numbers, negative whole numbers, and zero. • Every number has an additive inverse, and their sum is zero (e.g. -5 and 5 are additive inverses; $-5 + 5 = 0$ and $5 + -5 = 0$).		• Locating integers on a number line • Ordering whole negative and positive numbers using a number line • Identifying the additive inverse of any number • Representing addition and subtraction of integers using a number line • Using negative numbers to solve problems in a range of contexts, including the measurement of temperature and finance	• Locating negative and positive numbers on a number line • Comparing and ordering negative and positive numbers using a number line (e.g. $-3.4 < -3$) • Evaluating expressions involving negative numbers, addition, and subtraction (e.g. $3 + -7$)
	• Rounding, estimation, and using benchmarks support comparing numbers and checking whether findings are reasonable. • Division can result in a remainder expressed as a whole number, fraction, or decimal.		• Using rounding and estimation to predict results and to check the reasonableness of calculations (e.g. $0.73 + 0.8 + 0.999$ must be less than 3 since each are close to but less than 1) • Rounding whole numbers to any specified power of 10, and rounding decimals to the nearest whole number, tenth, or hundredth • Multiplying whole numbers • Dividing whole numbers by one- or two-digit divisors (e.g. $327 \div 5 = 65.4 \text{ or } 65\frac{2}{5}$)	• Using rounding, estimation, and benchmarks to predict results and to check the reasonableness of calculations (e.g. 14.7×5 must be between $14 \times 5 = 70$ and $15 \times 5 = 75$) • Rounding whole numbers to any specified power of 10, and rounding decimals to the nearest whole number, tenth, hundredth, or thousandth • Multiplying and dividing whole numbers (e.g. $327 \div 15 = 21.8 \text{ or } 21\frac{4}{5}$)
	• In expressions that have more than one operation, the order of operations is important; operations are done as follows: 1. operations grouped inside brackets 2. exponents such as squaring and cubing 3. multiplication and division, from left to right 4. addition and subtraction, from left to right. • A mnemonic, such as GEMA: grouped, exponents, multiplicative ($\times$ and $\div$), and additive ($+$ and $-$) can be used to remember the order of operations.		• Evaluating expressions using the order of operations	• Evaluating expressions with integers, using the order of operations

Number	Knowledge *The facts, concepts, principles, and theories to teach.*		Practices *The skills, strategies, and applications to teach.*	
	During Year 7	**During Year 8**	**During Year 7**	**During Year 8**
	• A fraction can describe a proportional relationship between two amounts. • Every fraction can be represented by an infinite set of equivalent fractions that occupy the same point on the number line. • Fractions can be converted to decimals using division, and the result can be: ○ a terminating decimal (e.g. $\frac{5}{16} = 0.3125$) ○ repeating and infinite decimal (e.g. $\frac{7}{3} = 2.\dot{3}$, $\frac{1}{7} = 0.\overline{142857}$) • In the simplest form of a fraction, the numerator and denominator do not share a common factor. • Scaling by powers of 10 and using number facts supports multiplication with decimals. • Multiplying a whole number by a fraction and finding that fraction of that whole number have the same result. • Percentages are decimal fractions with denominators of 100; they are represented using the percent symbol %.	• The product of two fractions can be found by multiplying the numerators and multiplying the denominators. • Percentages can be used to proportionally increase or decrease a quantity. • Ratios can be used to describe proportional relationships and unequal division of a whole. • Ratios, fractions, and percentages can all represent proportional relationships between two quantities.	• Identifying, reading, writing, and representing fractions, decimals, and percentages • Comparing, ordering, and converting between fractions, decimals, and percentages	
			• Finding equivalent fractions and representing fractions in their simplest form • Adding and subtracting fractions, including improper fractions and mixed numbers, and representing the answer in its simplest form • Adding and subtracting decimals • Multiplying and dividing numbers by powers of 10 • Multiplying whole numbers by fractions and representing the answer in its simplest form • Multiplying decimals by whole numbers (e.g. 0.7×5 and 0.7×50, which both relate to knowing $7 \times 5 = 35$) • Dividing fractions by whole numbers and representing the answer in its simplest form • Dividing a whole number by a unit fraction • Finding a fraction of a whole number (e.g. $\frac{5}{3}$ of 186) • Finding a whole amount when given a fraction (e.g. $\frac{5}{4}$ of the set is 85, what is the whole set?) • Finding common percentages of whole numbers • Finding the whole (100%) when given a percentage (e.g. 40% is 28) • Using proportional reasoning to explore multiplicative relationships between quantities (e.g. “If there are 3 red for every 7 blue balls, how many balls are there altogether when there are 18 red balls?”)	• Multiplying whole numbers by fractions, including by improper fractions, by mixed numbers, and by first converting to an improper fraction • Multiplying fractions and representing the answer in its simplest form • Multiplying and dividing numbers by powers of 10 • Multiplying positive decimals (e.g. 2.3×45) • Finding a fraction of a whole number, including when the result is a mixed number or improper fraction (e.g. for $\frac{2}{5}$ of 42, $\frac{2}{5} \times 42 = \frac{84}{5} = 16\frac{4}{5}$) • Finding a whole amount when given a fraction, including when the whole set is a mixed number or improper fraction (e.g. if 8 is $\frac{3}{5}$ of a set, $8 \times \frac{5}{3} = 13\frac{1}{3}$) • Finding percentages of whole numbers • Finding the whole (100%) when given a percentage (e.g. 3% is 27) • Identifying percentage equivalence in calculations (e.g. 45% of 20 is equal to 20% of 45) • Dividing a quantity into two parts, given the part:part or part:whole ratio • Expressing the division of quantity into two parts as a ratio
Financial mathematics	• Solutions to problems involving New Zealand currency are rounded to two decimal places. • Cash payments in New Zealand are rounded up or down to the nearest 10 cents.		• Calculating the total cost and change for a transaction involving any amount of money • Applying percentage discounts to whole dollar amounts (e.g. in a 20%-off sale)	• Creating and comparing weekly, monthly, and yearly finance plans (e.g. for saving plans, phone plans, budgets, and ‘buy now, pay later’ services) • Applying percentage discounts (e.g. a 35% discount on \$180 will give a new price of $\$180 - (0.35 \times \$180) = \$117$)

Algebra

Algebra	**Knowledge** *The facts, concepts, principles, and theories to teach.*		**Practices** *The skills, strategies, and applications to teach.*	
	During Year 7	**During Year 8**	**During Year 7**	**During Year 8**
Equations and relationships	• A variable can be used to represent: ○ an unknown number, often in formulae (e.g. s in s^2) ○ a quantity that can vary or change (e.g. $y = 3x + 4;\ A = bh$) ○ a specific unknown value to be solved (e.g. $3a = 18$). • The solution to an equation satisfies that equation. • Equations can be rearranged using inverse operations (e.g. addition and subtraction, multiplication and division). • Solutions to equations can be checked using substitution. • Equations can be solved through trial and error, but this can be an inefficient method.		• Forming and solving one- and two-step linear equations with integer solutions (e.g. $t + 7 = 12,\ 5s + 3 = 18$) • Checking the truth of and completing number sentences involving all four operations and including the use of inequalities (e.g. $0.8 \times 12 \leq 8 \times 0.5 + 8$, true or false?)	• Forming and solving linear equations with rational solutions (e.g. $t + 7 = 6.5,\ 5s + 9 = -18$) • Forming and solving linear inequalities and representing the solution on a number line (e.g. $t - 3 \geq -5$)
			• Using substitution to find the value of an expression or formula (e.g. calculating $w + 12$ given $w = 4$)	
	• Algebra has its own specialised notation to express relationships and operations concisely, including: ○ $3b$ in place of $b + b + b, 3 \times b$, and $b \times 3$ ○ b in place of $1\mathrm{b}$ ○ ab in place of $a \times b$ or $b \times a$ (in alphabetical order) ○ a^2 in place of $a \times a$, a^3 in place of $a \times a \times a$ ○ $\frac{a}{b}$ in place of $a \div b$ and $a \times \frac{1}{b}$ ○ a in place of a^1 ○ 1 in place of $\frac{a}{a}$ when $a \neq 0$.	• The distributive, commutative, and associative laws are true for all real numbers. • Algebraic expressions can be presented in many different ways including fully factorised, partially factorised, and fully expanded forms.	• Rearranging known formulae using one or two steps (e.g. making w the subject of $A = lw$) • Simplifying expressions involving any of the four operations by collecting like terms (e.g. $3a + a + a = 5a$, $3b - 2b = b$)	• Rearranging known formulae using one or two steps • Simplifying algebraic expressions involving sums, products, differences, and single brackets, and collecting like terms (e.g. $2(x + 3) + 1 = 2x + 6 + 1 = 2x + 7$) • Factorising simple algebraic expressions (e.g. $5x - 35 = 5(x - 7)$)
	• A coordinate plane extends to 4 quadrants that meet at the origin (0, 0). • Linear patterns have a constant increase or decrease, can be described by the rule $t = a \times n + d$, and can be graphed as a straight line on a coordinate plane.		• Identifying and plotting points in the four quadrants of the coordinate plane, using ordered pairs and values from a table • Using tables, graphs in the coordinate plane, and diagrams to recognise the relationship between the ordinal position and its corresponding element in a linear pattern, develop a rule for the pattern in words, and make conjectures about further elements in the pattern • Identifying the constant increase or decrease in a linear pattern, using variables and algebraic notation to represent the rule in an equation, and using the equation to make conjectures	
				• Investigating the patterns of triangular numbers, square numbers, and cube numbers, extending the patterns, creating tables of values, and plotting the values on the coordinate plane

Measurement

Measurement	Knowledge *The facts, concepts, principles, and theories to teach.*		Practices *The skills, strategies, and applications to teach.*	
	During Year 7	**During Year 8**	**During Year 7**	**During Year 8**
Measuring		• Liquids can be measured by capacity and by volume; there are standard conversions between measurements, in particular 1 mL = 1 cm^3, 1L = 1000 cm^3, and 1 m^3 = 1000 L.	• Selecting and using an appropriate base measure (e.g. metre, gram, litre) within the metric system, along with a prefix (e.g. kilo–, centi–) to show the size of units	• Estimating and measuring length, area, volume, capacity, mass (weight), temperature, time, and angle, using appropriate units • Converting between metric units of area (mm^2, cm^2, m^2, and km^2) and volume (mm^3, cm^3 and m^3) • Converting between different volume units (cm^3, m^3, mL, L)
	• Area is a two-dimensional measure, so its units are squared (e.g. cm^2). • Volume is a three-dimensional measure, so its units are cubed (e.g. cm^3). • Formulae represent the relationship between measurements and can be used to determine unknown measurements from known measurements. • Shapes can be decomposed or recomposed to help find their measurements (e.g. their perimeters, areas, and volumes). • Measurement formulae for perimeter are: ○ for a square: $P = 4l$ ○ for a rectangle: $P = 2(l + w)$. • Measurement formulae for area are: ○ for a triangle: $A = \frac{1}{2}bh$ or $A = \frac{bh}{2}$ ○ for a square: $A = l^2$ ○ for a rectangle: $A = lw \text{ or } A = bh$. • Measurement formulae for volume are: ○ for a cube: $V = l^3$ ○ for a rectangular prism: $V = lwh$.	• The area of a parallelogram is given by $A = bh$. • The area of a trapezium is given by $A = \frac{1}{2}(a + b)h$ or $A = \frac{(a+b)h}{2}$. • The volume of a triangular prism is given by $V = \frac{1}{2}bhl$.	• Using formulae to find unknown measurements related to perimeter (e.g. the length of the unknown sides of a square given its perimeter, the length of an unknown side in a composite shape given its perimeter) • Using formulae to find unknown measurements related to area (e.g. the base of a triangle given its area and height, the area of a figure composed of a triangle and rectangle, given side lengths) • Using formulae to find unknown measurements related to volume (e.g. the dimensions of a cube given its volume, the volume of a rectangular prism given side lengths)	• Calculating the area of a parallelogram and a trapezium • Calculating the area of a shape, given some lengths and its perimeter, and vice versa • Calculating lengths of quadrilaterals, given their area and other sufficient information • Calculating the volume of triangular prisms • Calculating the volume of composite figures made up of cubes, rectangular prisms, and/or triangular prisms
	• Duration questions can involve fractions of time and converting between units of time.		• Reading, interpreting, and using timetables and charts that present information about duration	• Reading, interpreting, and using timetables, charts and results that present information about duration. • Converting times to a given unit (e.g. hours and minutes to minutes)

Geometry

<table>
<tr><th rowspan="2">Geometry</th><th colspan="2">Knowledge
The facts, concepts, principles, and theories to teach.</th><th colspan="2">Practices
The skills, strategies, and applications to teach.</th></tr>
<tr><th>During Year 7</th><th>During Year 8</th><th>During Year 7</th><th>During Year 8</th></tr>
<tr><td>Shapes</td><td>• Triangles can be categorised by their angles.
○ An acute triangle has three acute angles.
○ A right triangle has one right angle.
○ An obtuse triangle has one obtuse angle.
• Triangles can also be categorised by their sides.
○ An equilateral triangle has three equal-length sides.
○ An isosceles triangle has at least two equal-length sides.
○ A scalene triangle has different measures for each side length.
• All angles in an equilateral triangle are 60°.
• The base angles (opposite the equal sides) of an isosceles triangle are equal.</td><td>• The radius is the distance from the outside of a circle to the centre.
• The diameter is the length of a line through the centre of a circle that touches opposite points on the edge of the circle.
• The circumference is the distance around a circle.</td><td>• Classifying triangles by both their angle and side properties</td><td>• Identifying and describing the parts of a circle: the radius, diameter, and circumference</td></tr>
<tr><td rowspan="2">Spatial reasoning</td><td colspan="2" rowspan="2">• The sum of the exterior angles of a polygon is 360°.
• In a regular polygon, all exterior angles are the same; an exterior angle can be found by subtracting the interior angle from 180° or by dividing 360° by the number of sides.
• The interior angle sum of a triangle is 180°; for a quadrilateral, it is 360°.
• The interior angle sum of any polygon can be found using the formula 180(n−2)°, where n represents the total number of sides.</td><td>• Transforming 2D shapes in the coordinate plane by a single translation, reflection across a given mirror line, or a rotation about a given point by a multiple of 90 degrees
• Identifying the 2D shapes that compose 3D shapes
• Drawing nets for prisms and pyramids</td><td>• Transforming 2D shapes on the coordinate plane, including composite shapes, by a combination of translations, reflections, rotations, and scaling by any factor</td></tr>
<tr><td>• Reasoning about unknown angles in situations involving perpendicular lines, parallel lines, and transversals
• Solving for an unknown angle in a diagram by setting up and solving a multi-step equation based on supplementary, complementary, vertical, and adjacent angle relationships</td><td>• Proving that the interior angle sum of a triangle is 180°, and generalising a rule for the interior angle sum and exterior angles for any polygon
• Reasoning about unknown angles in situations involving internal and external angles of polygons</td></tr>
<tr><td>Pathways</td><td></td><td>• A map's scale is the ratio between a distance on the map and the corresponding distance in the physical world.</td><td>• Interpreting and communicating the location of positions and pathways using coordinates, angle measures, and the eight main and halfway compass points (e.g. NE, which is 45° E from N)</td><td>• Using map scales, compass points, distance, and turn to interpret and communicate positions and pathways in coordinate systems and grid reference systems</td></tr>
</table>

Statistics

Statistics	Knowledge *The facts, concepts, principles, and theories to teach.*		Practices *The skills, strategies, and applications to teach.*	
	During Year 7	**During Year 8**	**During Year 7**	**During Year 8**
Developing knowledge from data	• A variable is an attribute or measurement of the people or objects being studied. ○ A categorical variable classifies objects or individuals into groups. ○ Discrete numerical variables are counted. ○ Continuous numerical variables are measured. • The response to a statistical question can be summarised by a measure of central tendency. ○ The mean is the average of numerical data. ○ The median is the middle value for sorted numerical data. ○ The mode is the data value with the highest frequency for categorical data or discrete numerical data. • The response to a statistical question can be summarised by the range as a measure of spread. The range for numerical data is the highest value minus the lowest value.		• Planning and collecting data in order to respond to a statistical question (e.g. Are our feet the same length?) • Calculating the mean, median, and mode for numerical data • Calculating the range for numerical data	
Visualisation of data	• Categorical data can be visualised through dot plots and bar graphs. • Paired categorical variables can be visualised through a stacked bar graph or a clustered bar graph. • Bivariate time-series data can be visualised through a time-series graph. • A good data visualisation should allow viewers to discern the variable or variables and who the data was collected from, and then, depending on the type of visualisation, additional information such as units for numerical variables, frequency, proportions, patterns, and trends. • Outliers are individual data points that are very much bigger or smaller than most of the data points. • Outliers skew the mean value for a data set towards themselves, but not the median value. • Outliers are not necessarily an error, as there are some events that occur rarely in many situations.		• For a given set of data, choosing and constructing an appropriate data visualisation according to the data type (e.g. a dot plot, bar graph, time-series graph) • Noticing and explaining outliers in a given set of data	
Interpretation of data	• The response to a statistical question includes findings that are summarised and interpreted in context and using evidence. • The tapering sides of a data visualisation are known as tails and may taper at the same rate, producing a symmetrical shape, or an uneven rate, producing a skewed shape. ○ In positively skewed data, the right-tail tapers more slowly than the left tail. ○ In negatively skewed data, the left tail tapers more slowly than the right tail. • Interpreting a data visualisation includes describing its variables and their units, the context for the data, and the visualisation's key features: ○ its shape (e.g. the number of peaks, and whether the shape is symmetrical or skewed) ○ its central tendency (where the middle of the data lies, as indicated visually by the centre of the visualisation and numerically by the median) ○ its spread (how spread the data is from the minimum to the maximum value, and the numerical value of the range) ○ other features depending on the type of data and the data visualisation (e.g. the least and most frequent categories in categorical data, trends for time-series data). • A graph that is missing parts (e.g. title, axis labels, axis scales) or has errors may have been made to be misleading or to hide information.		• Responding to statistical questions by calculating an appropriate measure of central tendency and range for a variety of data tables and data visualisations • Interpreting data visualisations, including those from contemporary media • Identifying when a data visualisation cannot be interpreted accurately due to missing information • Identifying outliers by eye and taking them into account when using range as a measure of spread	

Probability

Probability	Knowledge *The facts, concepts, principles, and theories to teach.*		Practices *The skills, strategies, and applications to teach.*	
	During Year 7	**During Year 8**	**During Year 7**	**During Year 8**
Experimental probability	• Some chance-based situations, such as rolling a weighted die, can only be explored through probability experiments. • Results from sets of repeated trials for the same experiment may vary. • The Law of Large Numbers states that as the number of trials in a chance experiment increases, the experimental probability will approach the experiment's theoretical probability. • The estimated probability of an event from an experiment is the number of times the event happens divided by the total number of trials in the experiment (i.e. the relative frequency for that event).		• Carrying out a chance experiment and calculating the experimental probability of each outcome • Comparing experimental probability (using at least 30 trials) to theoretical probability, and explaining why they differ and how increasing the number of trials reduces this difference • Carrying out chance experiments of at least 100 trials and comparing the experimental probability of each individual outcome to its theoretical probability, in order to demonstrate the Law of Large Numbers	
Theoretical probability	• Lists, tables, and tree diagrams are useful systematic methods for generating all possible outcomes. • If all possible outcomes are assumed to be equally likely, the probability of an event is $\frac{\text{number of ways the event can happen}}{\text{total number of possible outcomes}}$. • Probabilities can be expressed as a fraction or decimal between 0 and 1, or as a percentage between 0% and 100%. • An event is a subset of the sample space and thus can be a single outcome or a combination of outcomes. • The probability of an event and its complement add to 1.		• Calculating probabilities for events as decimals, fractions, and percentages • Comparing the likelihood of different events • Calculating probabilities for complementary events	

The language of Mathematics and Statistics for Phase 3 (Years 7–8)

	Year 7 *Students will be taught the following new words:*	**Year 8** *Students will be taught the following new words:*
Number	• associative • benchmark • brackets • commutative • discount • distributive • divisibility rule • evaluating expressions • expanded form • exponent, power • GEMA • highest common factor (HCF) • integer • least common multiple (LCM) • order of operations • negative • prime numbers, composite numbers • radicals • repeating and non-repeating decimals • round up or round down (finance) • square root • terminating decimals	• budget • cube number • cube root • negative exponent • prime factors • ratio
Algebra	• algebraic notation • expanded form • formulae • like terms • linear equation • linear patterns • ordered pairs • origin • rearrange • substitution • variable • value	• algebraic expression • factorised form, factorising • simplifying expression • triangular numbers
Measurement	• angles (complementary, supplementary, vertical, adjacent) • composite shape • duration • recompose	• deriving (formulae)
Geometry	• base angles • equilateral, isosceles, scalene triangle • exterior angle and interior angle	• grid reference • radius, diameter, circumference • scale (map)
Statistics	• central tendency • median, mode • outlier • skewed data (positively, negatively), tapering and tails.	
Probability	• complements / complementary event • experimental or theoretical probability • estimated probability • law of large numbers • relative frequency	• tree diagrams • weighted die

Phase 4 (Years 9–10) teaching sequence

Number

<table>
<tr><th rowspan="2">Number</th><th colspan="2">Knowledge
The facts, concepts, principles, and theories to teach.</th><th colspan="2">Practices
The skills, strategies, and applications to teach.</th></tr>
<tr><th>During Year 9</th><th>During Year 10</th><th>During Year 9</th><th>During Year 10</th></tr>
<tr><td rowspan="7">**Number structures and operations**</td><td rowspan="2">• A number written in scientific notation has the form $a \times 10^k$, where $1 \le a < 10$ and k is an integer.
• Repeated division can be summarised using exponent notation with a negative exponent.
• There are an infinite number of rational numbers between any two numbers; these can be represented by terminating decimals, recurring decimals, and fractions.
• Multiplying a fraction by an equivalent form of 1, such as $\frac{3}{3}$, results in an equivalent fraction.
• When giving a fraction as an answer, there should be a positive or negative integer in the numerator and a positive integer in the denominator.
• Numbers, including fractions, decimals, and percentages, can be represented using number lines.</td><td rowspan="2">• Non-repeating, infinite decimals are irrational numbers; some of them are represented by special symbols, such as $\sqrt{2}$ and π.
• The terms index, power, and exponent are used interchangeably.
• For the number a^n, a represents the base, and n represents the exponent.
• Exponent rules govern how operations involving exponents work and include:
○ $a^m \times a^n = a^{m+n}$ (the product-of-exponents rule)
○ $\frac{a^m}{a^n} = a^{m-n}$ (the quotient-of-exponents rule)
○ $(a^m)^n = a^{m \times n}$ (the exponent-of-exponents rule)
○ $a^{-m} = \frac{1}{a^m}, (a \neq 0)$ (the negative exponent rule)
○ $a^0 = 1$ $(a \neq 0)$ (the zero exponent rule).
• Only like roots can be added and subtracted; multiples of a root are represented with coefficients (e.g. $\sqrt{3} + \sqrt{3} = 2\sqrt{3}$).
• There are rules for working with roots, including not leaving roots in a denominator:
○ $\sqrt{a} \times \sqrt{a} = a$
○ $\sqrt{a} \times \sqrt{b} = \sqrt{ab}$
○ $\sqrt{a} \div \sqrt{a} = 1$
○ $\sqrt{a} \div \sqrt{b} = \sqrt{\frac{a}{b}} = \frac{\sqrt{a}}{\sqrt{b}} \times \frac{\sqrt{b}}{\sqrt{b}} = \frac{\sqrt{ab}}{b}$.</td><td colspan="2">• Identifying, reading, writing, representing, comparing, ordering, and converting between fractions, decimals, and percentages</td></tr>
<tr><td>• Recording, comparing, and ordering whole and decimal numbers using scientific notation (e.g. 3.14×10^3)
• Finding equivalent fractions, simplifying fractions, and converting between improper fractions and mixed numbers
• Expressing remainders from division as fractions or decimals, depending on the context
• Identifying powers of 2 through to 2^{10}
• Converting between negative powers and unit fractions (e.g. $3^{-2} = \frac{1}{9}$)
• Approximately locating roots on the number line with reference to the closest perfect square (e.g. $\sqrt{48}$ is between $\sqrt{36} = 6$ and $\sqrt{49} = 7$, but closer to 7)</td><td>• Recording, comparing, ordering, and calculating with numbers in scientific notation
• Identifying irrational numbers (e.g. $\sqrt[3]{10}, \pi$)
• Generalising about whether square and cube roots of whole numbers are rational or irrational
• Calculating using integer exponents
• Calculating exactly using fractions, roots, and multiples of π</td></tr>
<tr><td rowspan="2">• Rounding and estimation support efficiently predicting results and checking the reasonableness of calculations.</td><td rowspan="2">• The rules for identifying significant figures are:
○ all non-zero digits are significant
○ zeros appearing anywhere between two non-zero digits are significant
○ leading zeros are not significant
○ trailing zeros are significant if there is a decimal point present, and are not significant otherwise
○ exact numbers have an unlimited number of significant figures.
• For numbers written in scientific notation as $a \times 10^k$, the number of significant figures is determined by applying the rules to the value of a.</td><td>• Using rounding and estimation to predict results and to check the reasonableness of calculations</td><td>• Using rounding, including to specified significant figures, and estimation to predict results and to check the reasonableness of calculations</td></tr>
<tr><td colspan="2">• Rounding to the degree of precision required for the context</td></tr>
<tr><td colspan="2">• The order of operations is important when evaluating or forming expressions. Operations are done as follows:
1. grouped operations (e.g. expressions under a square root, involving the numerator of a fraction, or inside brackets)
2. exponents or powers
3. multiplication and division, from left to right
4. addition and subtraction, from left to right.
• A mnemonic, such as GEMA — Grouped (e.g. $\sqrt{3^2 + 4^2}$), Exponents (e.g.$(-2)^3$), Multiplicative (× and ÷), Additive (+ and −) — can be used to remember the order of operations.</td><td>• Generalising about exponents of 0 and 1
• Adding, subtracting, multiplying, and dividing integers
• Generalising the rule for dividing by a fraction by starting with dividing a whole number by a fraction
• Adding, subtracting, multiplying, and dividing fractions and decimals
• Connecting multiplying or dividing decimals with multiplying or dividing fractions (e.g. $0.3 \times 0.15 = \frac{3}{10} \times \frac{15}{100}$).</td><td>• Adding, subtracting, multiplying, and dividing positive and negative numbers, including fractions and decimals
• Evaluating positive integer exponents for positive and negative numbers (e.g. $3^5, (-1)^4$)</td></tr>
</table>

Number	Knowledge *The facts, concepts, principles, and theories to teach.*		Practices *The skills, strategies, and applications to teach.*	
	During Year 9	**During Year 10**	**During Year 9**	**During Year 10**
	• Every non-zero number has a multiplicative inverse (reciprocal), and their product is 1 (e.g. 5 and $\frac{1}{5}$ are reciprocals, so $5 \times \frac{1}{5} = \frac{1}{5} \times 5 = 1$).		• Checking for equivalence in expressions involving negative numbers (e.g. $(-3)^2 \neq -3^2$, $-2+3 = 3+(-2)$, $2 \times (-3) = (-3) \times 2 = (-2) \times 3$, $\frac{2}{-3} = \frac{-2}{3} = -\frac{2}{3}$)	
	• Percentages are a way of expressing a fraction of 100. • Percentages can be used to proportionally increase or decrease a quantity by multiplication and can be presented as decimal multipliers. ○ A percentage increase can be described by the additional percentage or the percentage of the final amount compared to the original amount (e.g. a 20% increase represents 120% of the original amount). ○ A percentage decrease can be described by the percentage lost or the percentage of the final amount compared to the original amount (e.g. a 20% decrease represents 80% of the original amount). • Ratios show part-to-part or part-to-whole comparisons of two or more quantities. • Ratios can be scaled up or down or simplified. • A rate proportionally compares two quantities that have different units of measure; when working with rates, 'per' means 'for every' in day-to-day contexts.		• Finding a fraction or percentage of a number • Finding the whole amount, given a fraction or percentage (e.g. 20% of an amount is 30. What is the original amount?) • Expressing a number as a fraction or percentage of another number	
			• Increasing or decreasing a number by a given proportion • Representing proportional relationships using whole-number ratios, including reducing the ratios to their simplest form • Dividing a quantity into two parts, given the part:part or part:whole ratio • Finding equivalent ratios and rates by scaling up or down	• Applying a proportional increase or decrease to a number • Calculating the percentage increase or decrease between two numbers (e.g. What is the percentage increase between 50 and 75?) • Comparing and using ratios and rate (e.g. finding speed, given distance and time)
Financial mathematics	• Percentages, ratios, rates, and proportions are often applied in financial situations.		• Applying percentage mark-ups and discounts • Calculating simple interest and GST on dollar amounts (e.g. finding 15% GST on $432)	• Converting New Zealand dollars into other currencies, and vice versa • Finding proportions of costs (e.g. the price of 400 g of an item, given the cost per kilogram) • Calculating compound interest on dollar amounts, by calculating simple interest month by month for short time periods (e.g. How much do you have after 3 months if you invest $100 at a 2.5%-per-month interest rate?)

Algebra

Algebra	Knowledge *The facts, concepts, principles, and theories to teach.*		Practices *The skills, strategies, and applications to teach.*	
	During Year 9	**During Year 10**	**During Year 9**	**During Year 10**
Equations and relationships	• The properties of operations (commutative, distributive, associative, inverse, and identity) and the order of operations apply to numbers and variables. • When operating on or writing equations with fractions, fractions of magnitude greater than 1 are usually written as improper fractions.		• Simplifying and manipulating algebraic expressions involving sums, products, differences, and positive integer powers, by: ○ collecting like terms ○ factorising using common factors ○ expanding products, including multiplying a single term by a bracketed term. • Generalising the properties of operations with variables (e.g. multiplication is distributive over subtraction) • Multiplying or dividing by -1 in inequalities (e.g.$-3 < 5$) • Forming and solving linear equations with rational number coefficients and linear inequalities with positive coefficients • Using substitution to find the value of an expression or a formula, given the values of its variables • Rearranging formulae (e.g. solving P $= 2l + 2w$ for w)	• Simplifying and manipulating algebraic expressions involving sums, products, differences, and positive integer powers, by: ○ collecting like terms ○ factorising using common factors ○ factorising quadratic expressions with a leading coefficient of 1 ○ expanding products, including multiplying a single term by a bracketed term, and multiplying two expressions each of the form $ax + b$, where a and b are integers ○ factorising by grouping (i.e. using the distributive law) (e.g. $x^2 + 2x - 8 = x^2 + 4x - 2x - 8 = x(x+4) - 2(x+4) = (x-2)(x+4)$) • Forming and solving linear equations and linear inequalities with rational number coefficients
		• Multiplying or dividing by a negative number reverses an inequality. • The constant rate of change of a linear graph is the vertical change (how far it goes up or down) divided by the horizontal change (how far it moves sideways). • Finding square roots of numbers and solving quadratic equations are related but have some differences. ○ Any positive real number has two square roots: one positive (the principal square root) and one negative (e.g. for 16, 4 and -4). ○ The square root operation $\sqrt{\ }$ refers specifically to the principal square root (e.g. $\sqrt{16} = 4$).		

Algebra	Knowledge *The facts, concepts, principles, and theories to teach.*		Practices *The skills, strategies, and applications to teach.*	
	During Year 9	**During Year 10**	**During Year 9**	**During Year 10**
		○ There are 0, 1, or 2 real-number solutions to $x^2 = a$, where a is a number. • The zero product property states that if two expressions multiply to be zero, then at least one expression must be zero (e.g. if $ab = 0$ then either a or b is 0, or if $(x-a)(x-b) = 0$ then either $(x-a) = 0$ or $(x-b) = 0$). • There are specific factorising relationships that are useful to recognise: ○ $x(x+a) = x^2 + ax$ ○ difference of two squares: $(x+a)(x-a) = x^2 - a^2$ ○ square of a sum: $(x+a)^2 = x^2 + 2ax + a^2$ ○ square of a difference: $(x-a)^2 = x^2 - 2ax + a^2$. • The solution to a linear inequality is a set of values which may be represented with a number line.		(e.g. $-\frac{2}{5}x + 5 \leq -10$), giving exact or rounded solutions, and representing the solution on a number line • Solving quadratic equations that are factorised or of the form $x^2 + c = 0$ (where c is an integer), and connecting the solutions to the x-intercepts of the related graph • Substituting into, rearranging, and simplifying expressions or formulae that involve squares or square roots (e.g. $A = \pi r^2$, $c^2 = a^2 + b^2$)
	• For a specific straight line, the gradient, m, and y-intercept, c, are fixed, and x varies with y according to the rule $y = mx + c$. • The y-intercept touches the y –axis and has coordinates $(0, c)$.		• Interpreting rules of the form $y = mx + c$ and using a combination of substitution and tables to plot points from the linear graph, connecting the points to form a line • Identifying the sign of m from tables of values, and linear graphs • Identifying the value of c for a straight line, from tables of values and from linear graphs • Using tables and graphs in the coordinate plane (showing all four quadrants), and diagrams to recognise the relationship between the ordinal position and its corresponding element in a linear pattern; developing a rule for the pattern in words; and making conjectures about further elements in the pattern • Identifying the constant increase or decrease in a linear pattern, using variables and algebraic notation to represent the rule in an equation, and drawing on the rule to make conjectures	• Interpreting and graphing linear equations in the form $y = mx + c$, using the gradient and y-intercept • Calculating the gradient and y –intercept of a line, using a graph • Comparing the relative magnitude of m in two or more linear graphs, using the concept of steepness and relating it to the magnitude of m • Finding the equation of a line, given two points or the gradient and a single point • Determining the effect on graphs in the coordinate plane of changing the coefficient of x^2 and the fixed value c, for a range of quadratic equations of the form $y = ax^2$ or $y = x^2 + c$, where a is a positive integer and c is an integer
	• In the equation of a line $y = mx + c$, m and c represent constants (they are unchanging), y and x can vary, and all the values of x and y that satisfy the equation create an infinite number of points that form the line. • The gradient is a ratio that can be interpreted as the 'steepness' of a linear graph. ○ A positive gradient slopes upwards when the graph is read from left to right. ○ A negative gradient slopes downwards when the graph is read from left to right. ○ A horizontal line has a gradient equal to zero. Its equation will be $y = c$.	• The gradient m of a straight line can be determined with the formula $m = \frac{rise}{run} = \frac{\Delta y}{\Delta x}$. • A vertical line has an infinite gradient. This cannot be expressed in the formula $m = \frac{rise}{run}$ as it becomes $m = \frac{rise}{0}$, which cannot be evaluated. • The equation of a vertical line is $x = b$, where the x-intercept is $(b, 0)$.		

Measurement

Measurement	Knowledge *The facts, concepts, principles, and theories to teach.*		Practices *The skills, strategies, and applications to teach.*	
	During Year 9	**During Year 10**	**During Year 9**	**During Year 10**
Measuring	• A solution to a calculation cannot be more precise than the least precise number used in that calculation.		• Estimating, calculating, converting, and accurately representing measurements	• Estimating, calculating, converting, and accurately representing measurements using significant figures
		• The number of significant figures in a measurement is the number of digits that contribute to the degree of accuracy of the measurement, given as the number of digits known with certainty plus one uncertain digit. • When calculating, it is best to use at least one more significant figure than is required in the final solution, and round at the end of the whole calculation.		

Measurement	**Knowledge** *The facts, concepts, principles, and theories to teach.*		**Practices** *The skills, strategies, and applications to teach.*	
	During Year 9	**During Year 10**	**During Year 9**	**During Year 10**
	• Conversions between different-sized metric units may be needed to give the appropriate units for a measurement or calculation. • The metric prefixes ‘kilo–’, ‘mega–’, ‘giga–’, and ‘tera–’ signify a unit that is one thousand, one million, one billion, and one trillion times larger than the base unit. • The metric prefixes ‘centi–’, ‘milli–’, ‘micro–’, and ‘nano–’ signify a unit one hundredth, one thousandth, one millionth, and one billionth the size of the base unit. • Derived units (e.g. cm^2, $\mathrm{km/h}$) reflect a relationship — a product or quotient — between two different measurements.		• Selecting and using appropriate measurement units for a given context, converting between metric units if necessary and using appropriate prefixes	• Converting between metric units, and using the appropriate prefixes in the metric system (e.g. kilo–, mega–, centi–, milli–, micro–)

	• The constant π is found by dividing a circle’s circumference by its diameter.
	• For a circle of radius r, the circumference is $2\pi r$.
		• The area of a circle is given by A $= \pi r^2$.
		• The surface area of a solid object is a measure of the total area that the surface of the object occupies.
		• The general formula for the volume of a prism is $V = Al$, where A is the consistent cross-sectional area and l is perpendicular to the plane of the cross-sectional area.
			• Finding:
			  ○ the perimeter of 2D shapes
			  ○ the circumference of circles
			  ○ the area of parallelograms, trapeziums, and kites, relating the formulae used to the formula for a rectangle
			• Deriving the formulae for the perimeter of half and quarter circles from the formula for a full circle
			• Calculating the perimeter of half circles and quarter circles
				• Finding:
				  ○ the area of circles and composite shapes that include circles or semicircles
				  ○ the surface area and volume or capacity of prisms, pyramids, and cylinders
				• Deriving the formulae for the area of half and quarter circles from the formula for a full circle
				• Deriving the formulae for the surface area of cubes, rectangular prisms, and cylinders
				• Calculating the area of half circles and quarter circles
				• Calculating the surface area of cubes, rectangular prisms, triangular prisms, cylinders, and composite figures
				• Calculating the volume of cylinders and irregular prisms with a consistent cross-sectional area

		• Resizing (enlarging or reducing) a shape changes its perimeter, area, or volume proportionally according to the dimensions of the units; linear metric conversions must be squared to convert area and cubed to convert volume.		• Scaling a shape by a factor, and determining the scale factor for the scaled shape’s area or volume

	• For right-angled triangles, Pythagoras’ theorem states that the square of the hypotenuse (longest side) is equal to the sum of the squares of the other two sides.
	• If (a, b, c) is a Pythagorean triple, then so is (ka, kb, kc), where k is a positive integer.
			• Using Pythagoras’ theorem to:
			  ○ verify that given side lengths in a right-angled triangle satisfy the theorem
			  ○ find the length of the hypotenuse in a right-angled triangle, given the lengths of the other two sides
			• Proving Pythagoras’ theorem (e.g. by rearranging four congruent right-angled triangles into a square)
			• Finding another Pythagorean triple from a given Pythagorean triple
				• Using Pythagoras’ theorem to:
				  ○ find the length of an unknown side in a right-angled triangle
				  ○ check if a triangle has a right angle
				  ○ calculate the distance between two points in the coordinate plane, yielding the distance formula $d = \sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}$

	• There is a fixed relationship between speed, distance, and time: $\mathrm{speed} = \frac{\mathrm{distance}}{\mathrm{time}}$. • In position-time graphs, the gradient represents speed.		• Finding distance, given speed and time • Finding time, given distance and speed	• Finding speed, distance, or time, given any two of the measurements
	• Decimal measures are used for very small durations (e.g. milliseconds); the rest of time measurement uses a different system, based principally on 12 and 60.		• Reasoning about duration using different units of time, including decimal fractions of milliseconds where appropriate	

Geometry

Geometry	**Knowledge** *The facts, concepts, principles, and theories to teach.*		**Practices** *The skills, strategies, and applications to teach.*	
	During Year 9	**During Year 10**	**During Year 9**	**During Year 10**
Shapes	• A circle is the path traced out by a point moving in a plane and always a fixed distance (the radius) from a central point. • Angles between parallel lines and a transversal can be corresponding, co-interior, or alternate; corresponding angles are equal, and alternate angles are equal.	• In similar shapes, corresponding angles are equal and the lengths of corresponding sides are proportional. • Congruent shapes are identical in shape and size.	• Identifying and describing parts of a circle (e.g. a chord; the diameter, radius, and circumference) and how they relate to each other • Reasoning about unknown angles in situations involving intersecting and parallel lines and transversals. • Verifying that two lines are parallel, using angles at the intersections of a transversal	• Using the properties of similarity in 2D shapes, including right-angled triangles, to find unknown lengths and angles
Spatial reasoning	• A set of points in a plane can be transformed by translation, reflection about a line, and rotation about a fixed point.		• Representing and constructing 3D shapes, including rectangular and triangular prisms and pyramids, from nets and plan views drawings • Transforming 2D shapes in the coordinate plane by translation, reflection about a given line of symmetry, and rotation about a given point by a multiple of 90 degrees	• Representing and constructing 3D shapes, including cylinders, from nets • Transforming 2D shapes, including composite shapes, by resizing them by any scale factor

Statistics

Statistics	**Knowledge** *The facts, concepts, principles, and theories to teach.*		**Practices** *The skills, strategies, and applications to teach.*	
	During Year 9	**During Year 10**	**During Year 9**	**During Year 10**
Developing knowledge from data	• Multivariate data is data in a set that has more than two variables. • Data can be collected from observational studies in which the observers do not alter or control the behaviour of the subjects. • Statistical questions clearly identify the variable, group of interest, and the intent of an investigation. ○ A summary investigation is about a group. ○ A comparison investigation compares a variable across two clearly identified groups. ○ A relationship investigation looks for a connection between paired numerical or paired categorical variables. ○ A time-series investigation looks at a variable over time. • Primary data is data that is collected first-hand. • Secondary data is data collected by someone else.	• It is not always possible to get data from the entire population (as in a census). To make inferences about a population without a census, sampling is used. • Samples must be taken randomly from the population, otherwise there will be bias in the data, leading to inaccurate and misleading statistics. Samples are ideally chosen using simple random sampling, in which each item of the population has an equal probability of being chosen. • When sampling from a population, the distribution for a variable varies from sample to sample. To make a reliable inference about what is happening in the population, sample sizes need to be: ○ about 1,000 for categorical variables (with the sample obtained using technology) ○ at least 30 for numerical variables.	• Planning and collecting multivariate data to respond to a statistical question and where at least one variable is categorical and at least one is numerical • Calculating the five-point-summary for numerical data: ○ the minimum value ○ the value of quartile 1, or Q_1 ○ the value of the median or quartile 2, or Q_2 ○ the value of quartile 3, or Q_3 ○ the maximum value • Calculating the interquartile range as $IQR = Q_3 - Q_1$	• Planning and collecting multivariate data to respond to a statistical question using a sample or census • Reasoning why a mean or median would be a better measure of central tendency for a given statistical question
Visualisation of data	• A distribution is formed from all the possible values of a variable and their frequencies. It can be shown using data visualisations that show patterns, trends, and variations and that include dot plots, bar graphs, frequency tables, box plots, histograms, time-series graphs, scatter plots, and two-way tables. • A good data visualisation should allow viewers to discern the variable(s) and who the data was collected from, and then, depending on the type of visualisation, additional information such as frequency, proportions, patterns or trends, and units for numerical variables.		• Creating multiple data visualisations for an investigation • Selecting appropriate scales for data	

Statistics	Knowledge *The facts, concepts, principles, and theories to teach.*		Practices *The skills, strategies, and applications to teach.*	
	During Year 9	**During Year 10**	**During Year 9**	**During Year 10**
	• In relationship investigations: ○ sometimes one variable is thought of as predictive of the other variable; then the response or dependent variable is on the y-axis, and the 'predictive', explanatory, or independent variable is on the x-axis ○ an eyeballed line or curve of best fit can be added for paired numerical data.		• For relationship investigations, drawing an eyeballed line or curve of best fit to predict possible y-values (the response variable) for given x-values (the explanatory variable)	
Interpretation of data	• Elements of chance affect the certainty of results from observational studies and experiments. • Uncertainty should be taken into account when making claims.		• Critically considering data visualisations, including those from contemporary media, to see if they support or misrepresent the data	
	• Data visualisations need to be critically assessed to see if they support or misrepresent the data.	• To compare data on the same variable from two groups in the same population, the 75%-to-50% comparison rule for informal inferences is used. If the groups are called *A* and *B*, and If more than 50% of group *B*'s data is larger than 75% of group *A*'s data, then we can make the claim that *B* tends to be larger than *A* back in the population. • An interpolation involves making predictions within the range of a numerical data variable. • An extrapolation involves making predictions outside the range of a numerical data variable.	• Communicating findings in context to answer an investigative question, using evidence • Providing possible explanations for findings • Comparing findings to initial conjectures or assertions and existing knowledge • Evaluating findings and data-collection methods to check whether claims or statements are supported by the data	• Communicating findings in context to answer an investigative question, using evidence and with an awareness of variability • Making an informal inference in comparative situations about what might be happening in the population, based on visual considerations and using the 75%-to-50% comparison rule • Making informal predictions from scatter plots in relationship situations

Probability

Probability	Knowledge *The facts, concepts, principles, and theories to teach.*		Practices *The skills, strategies, and applications to teach.*	
	During Year 9	**During Year 10**	**During Year 9**	**During Year 10**
Experimental and theoretical probability	• Some chance-based situations, such as tossing a non-regular 3D shape, can only be explored through probability experiments. • Results from sets of repeated trials for the same experiment may vary. • The Law of Large Numbers states that as the number of trials in a chance experiment increases, the experimental probability will approach the experiment's theoretical probability. • Lists, tables, two-way tables, and tree diagrams are useful systematic methods for generating all possible outcomes. • In joint events, events can be dependent or independent. • Probabilities for joint events cannot simply be added, because doing so would double-count outcomes that are common to both events. • Mutually exclusive events cannot occur together. • The estimated probability of an event from an experiment is the number of times the event happens divided by the total number of trials in the experiment (i.e. the relative frequency for that event).		• Carrying out a chance experiment, including running simulations for a large number of trials using digital tools • Systematically listing outcomes for the sample space • Comparing experimental probability (from at least 30 trials) to theoretical probability for a chance experiment, and explaining why they differ and how increasing the number of trials reduces this difference • Carrying out chance experiments of at least 100 trials and comparing the experimental probability of each individual outcome to its theoretical probability, in order to demonstrate the Law of Large Numbers • Creating and describing data visualisations for the distribution of observed outcomes from a chance experiment • Calculating probability estimates for different outcomes	

The language of Mathematics and Statistics for Phase 4 (Years 9–10)

	Year 9 *Students will be taught the following new words:*		**Year 10** *Students will be taught the following new words:*
Number	• GST • index • irrational number • like roots • original amount • precision	• rate • reciprocal • recurring • scientific notation • simple interest	• compound interest • principal square root • significant figures
Algebra	• expanding • gradient, slope • intercept	• linear relationship • rate of change	• operator • quadratic equation, relationship • zero product property
Measurement	• accuracy • chord • congruent • derived unit • hypotenuse	• mega–, giga–, tera– • micro–, nano– • Pythagorean triple • speed	• distance formula • resizing • scale factor • surface area
Geometry	• alternate, co-interior, or corresponding angles	• intersect • transversal	• similarity
Statistics	• comparison investigation, relationship investigation, summary investigation, time-series investigation • distribution • explanatory variable	• line or curve of best fit • multivariate data • population • quartile	• sampling • informal inference • interpolation, extrapolation • 75%-to-50% comparison rule
Probability	• elements of chance • joint events • mutually exclusive	• probability estimate • simulation	

Assessment requirements

High-quality assessment information should be used to inform the development and implementation of teaching and learning programmes, communicate student progress and achievement to parents, and monitoring and evaluation of how well the school is supporting every student to progress and achieve across the curriculum.

Using assessment to understand student progress and achievement

Assessment is an essential component of quality teaching and learning. Timely, high-quality, assessment information enables informed decision-making by teachers, whānau, and school leaders to improve student outcomes and progress. Its ultimate purpose is to empower students to reach their full potential by making learning visible, measurable, and actionable.

Using robust assessment data allows teachers to tailor their teaching to what works best for their students, including identifying areas where additional support is required. It also enables schools to provide parents, whānau, and caregivers with clear, meaningful information about their child's progress at school.

School leaders are responsible for ensuring systems and strategies are in place to closely monitor student progress and achievement and to prioritise actions that support classroom teaching. This includes the use of specified assessment tools as outlined below.

Teachers actively assess student progress in relation to the year-by-year teaching sequences, using effective assessment practices. As teachers are monitoring progress and achievement, they pay particular attention to whether students are making sufficient progress to engage in the next year of learning.

Effective assessment practices involve consistently monitoring, responding to, and reporting on student progress and achievement. This includes synthesising information from observations, conversations with students, periodic tasks and data from assessment tools (including those specified below) to build a well-rounded understanding of each student's knowledge and capabilities.

Using formative assessment to inform explicit teaching

Formative assessment is essential to explicit teaching because it helps teachers check what students understand at each step of the learning process. It allows them to adjust their instruction in real time by clarifying, modelling, or reteaching, so that every student can confidently move forward with new learning.

Assessment enables teachers to notice and recognise students' development, consolidation, and proficient use of learning area knowledge within daily lessons, and to provide timely, targeted feedback. Teachers respond to assessment insights by adapting their practice, for example, by adjusting the level of scaffolding or support provided.

In addition to ongoing observations, teachers use purposefully designed formative assessment tasks at key points throughout a unit or topic. These tasks highlight the concepts and reasoning students understand and apply, helping teachers identify learning barriers and ensure every student can demonstrate what they know and can do.

When planning next steps in teaching and learning, teachers consider students' strengths and responses along with opportunities for consolidation. These next steps may include:

- designing scaffolds to support and enrich students learning
- providing opportunities for students to apply new learning
- planning lessons that revise, reteach, or consolidate learning.

Timely feedback and immediate attention to misconceptions helps students grasp new ideas efficiently and accurately, while also promoting deeper learning. Teachers use this feedback to prompt recall of prior knowledge, encourage connection between concepts and ideas, and expand students' understanding.

Specific assessment requirements — assessment tools

The assessment tools outlined here must be used in conjunction with other assessment approaches, such as observation, conversations, self-assessment, and learning activities. The results from these tools are shared with parents and whānau to keep them well informed about their child's progress.

Assessment tools for twice yearly assessment of maths for Year 3–8 students

The use of reliable assessment tools alongside teacher's day-to-day observations, helps teachers notice each student's next learning steps, track their progress, and ensure timely support for those who need it.

School boards and principals must make sure that staff administer twice-yearly assessments for each student in Years 3–8 to monitor their progress in maths using **one** of the following tools:

- SMART (Student, Monitoring, Assessment and Report Tool), provided by the Ministry of Education
- PATs (Progressive Achievement Tests), provided by the New Zealand Council for Educational Research
- e-asTTle (during 2026 only), provided by the Ministry of Education.

For some students, teachers may need to address barriers associated with the environment, equipment, or engagement to enable them to successfully participate in and demonstrate their knowledge during assessments.

For a small number of students with additional learning needs it may not be appropriate to use the specified tools. In these cases, alternative assessment methods should be used to assess progress maths learning progress for the twice-yearly assessments, as agreed in the student's support plan.

Overall assessments of how students are progressing against curricula expectations

Monitoring each student's progress and achievement across all learning areas is essential. This requires the use of high-quality information informed by effective assessment practices, including robust and reliable assessment tools. It is important to monitor how each student is progressing and achieving across each learning area, using good quality information that is informed by effective assessment practices, including the use of robust and reliable assessment tools. It is critical that teachers have confidence in the evidence they use to support their instructional decisions.

To ensure consistency in how teachers make and communicate informed decisions about students' progress in Mathematics & Statistics school boards and principals must ensure that staff use the common progress descriptors, **Emerging, Developing, Consolidating, Proficient,** and **Exceeding** — for each student, as outlined below.

Emerging Students require support to meet curriculum expectation for their year level and/or goals as described in their personalised learning plan.

Developing Students are making some progress towards curriculum expectations for their year level.	
Consolidating Students are meeting many curriculum expectations for their year level and are steadily strengthening their understanding across learning areas.	
Proficient Students are meeting curriculum expectations for their year level.	
Exceeding Students are exceeding curriculum expectations for their year level.	

When making an informed decision, teachers need to consider progress and achievement across each knowledge strand of the learning area and select the progress descriptor that best describes how the student's progress is tracking towards the end of year expectation. Teachers should then use these strand level informed decisions to make an overall assessment of progress across the learning area. To do this, teachers should refer to the learning area sequence for each year level.

If assessments conducted during the school year show that a student is at the *Consolidating, Proficient,* or *Exceeding level*, then their progress is considered to be on track. For students identified at *Proficient* and *Exceeding*, teachers should provide extended learning opportunities and enrichment activities that reflect the breadth and depth of the curriculum.

If a student is at the *Emerging* or *Developing level,* their progress is considered to not be on track to meet curriculum expectations for their year level. For these students, teachers will need to adjust classroom practice, develop individualised responses, or trigger additional learning support. When appropriate, teachers should report against the goals outlined in the student's support plan.

If end-of-year assessments indicate that a student is at the *Proficient* or *Exceeding level*, their progress is considered to have met curriculum expectations. Students assess at the *Emerging*, *Developing,* or *Consolidating levels*, are considered to have not yet met curriculum expectations for their year level.

For students with additional learning needs, who have individualised progress goals and assessments outlined in their support plans, the common descriptors should generally still be used. However, in these cases, the descriptors reflect the student's overall progress against their individual goals rather than the year level curriculum expectations. School leaders must ensure that monitoring systems clearly indicate when descriptors are being applied to individualised goals, while also maintaining visibility of progress toward year-level curriculum expectations.

Reading, writing, and maths teaching time requirements

The teaching and learning of reading, writing[1], and maths[2] is a priority for all schools. So that all students are getting sufficient teaching and learning time for reading, writing, and maths, each school board with students in Years 0–8 must, through its principal and staff, structure their teaching and learning programmes and/or timetables to provide:

- 10 hours per week of teaching and learning focused on supporting students' progress and achievement in reading and writing, and recognising the important contribution oral language development makes, particularly in the early phases of learning
- 5 hours per week of teaching and learning focused on supporting students' progress and achievement in maths.

Where reading, writing, and/or maths teaching and learning time is occurring within the context of national curriculum statements other than English or Mathematics & Statistics, the progression of students' reading, writing, and/or maths dispositions, knowledge, and skills at the appropriate level must be explicitly and intentionally planned for and attended to.

Boards must also continue to give effect to the existing Structuring teaching time for reading, writing and maths foundation curriculum policy statement for The New Zealand Curriculum.

[1] While the terms reading and writing are used, these expectations are inclusive of alternative methods of communication, including New Zealand Sign Language, augmentative and alternative communication (AAC), and Braille.

[2] For simplicity, 'maths' is used as an all-encompassing term to refer to the grouping of subject matter, dispositions, skills, competencies, and understandings that encompasses all aspects of numeracy, mathematics, and statistics.

Regulatory context and implementation requirements

The National Curriculum for schooling consists of two pathways that together provide the statement of official policy relating to teaching, learning, and assessment in state and state-integrated schools in New Zealand:

- Te Marautanga o Aotearoa, which is designed for delivery in te reo Māori immersion and bilingual settings
- the New Zealand Curriculum, which is designed for delivery in all other state and state-integrated settings.

This document is *Curriculum Statement (The New Zealand Curriculum – Mathematics and Statistics Years 0–10) 2025*. *Curriculum Statement (Te Marautanga o Aotearoa – Pāngarau Years 0–10) 2025* is published separately.

Curriculum Statement (The New Zealand Curriculum – Mathematics and Statistics Years 0–10) 2025 is published by the Minister of Education under section 90(1) of the Education and Training Act 2020 (the Act) as a foundation curriculum policy statement and a national curriculum statement. These are the statements of official policy in relation to the teaching of Mathematics & Statistics that give direction to each school's curriculum and assessment responsibilities (section 127 of the Act), teaching and learning programmes (section 164 of the Act), and monitoring and reporting of student performance (section 165 of the Act and associated Regulations). School boards must ensure that they and their principal and staff give effect to these statements. Mathematics and Statistics is a required learning area within the New Zealand Curriculum, to be taught through to Year 10 in full to all students. For a very small number of students with additional learning needs, individualised progress goals may be agreed in partnership with them and/or their family as part of a student's support plan.

The sections of *Curriculum Statement (The New Zealand Curriculum – Mathematics and Statistics Years 0–10) 2025* that are published as a foundation curriculum policy statement are the assessment requirements. These set out requirements for teaching, learning, and assessment that underpin the Mathematics & Statistics national curriculum statement and give direction for effective Mathematics & Statistics teaching and learning programmes. The rest is published as a national curriculum statement. This sets out what all students are to be taught over their time at school, including the desirable levels of knowledge, understanding, and skill to be achieved in Mathematics & Statistics.

Curriculum Statement (The New Zealand Curriculum – Mathematics and Statistics Years 0–10) 2025 comes into effect on 1 January 2026, replacing the existing Mathematics and Statistics statements through to Year 10 (curriculum level 5). The remainder of the national curriculum statement for Mathematics and Statistics gazetted in 2009 remains in force for Years 11–13 (curriculum levels 6–8). Schools should choose the appropriate Mathematics & Statistics statements for their students' needs. For example, schools may choose to make use of the Years 0–10 teaching sequence for some senior secondary students if they are working below curriculum level 6.

Depending on their contexts, some schools may not be ready for full implementation on day one of the 2026 school year. These schools will need to make a start by developing, and then executing, a plan that achieves full implementation as soon as practicable over the course of 2026.

Different implementation requirements in place for schools run by a specified kura board. A specified kura board means the board of any of the following:

- a kura kaupapa Māori
- a designated character school with a character that is hapū- or iwi-based or that affiliates with Ngā Kura ā-Iwi o Aotearoa
- a state integrated school with a special character that is hapū- or iwi-based.

For schools run by a specified kura board, the national curriculum statement comes into force on 1 January 2027 and the foundation curriculum policy statement applies to the national curriculum statement from that date. The transition time for specified kura boards is to allow time for the Crown to engage with Kaupapa Māori education providers through their representative bodies in advance of these decisions affecting their kura.