Nau mai, haere mai! Tālofa lava. Mālō e lelei. Kia orāna. Fakaalofa lahi atu. Mālō ni.

Education Perfect has partnered with the Ministry of Education to provide online Maths resources for Years 9-10 students (including lessons and assessments) to all secondary schools across the motu. As part of that partnership, Education Perfect will also develop NZC-aligned content for Years 7 and 8.

Following the recent release of the updated Mathematics and Statistics Curriculum, we are following a two-stage approach to aligning our content:

- **Stage 1:** Ensure teachers have what they need to deliver the new NZC Maths from the start of the school year. This includes alignment of our comprehensive selection of existing materials and surfacing the new Y7-10 curriculum structure and terminology within the platform.

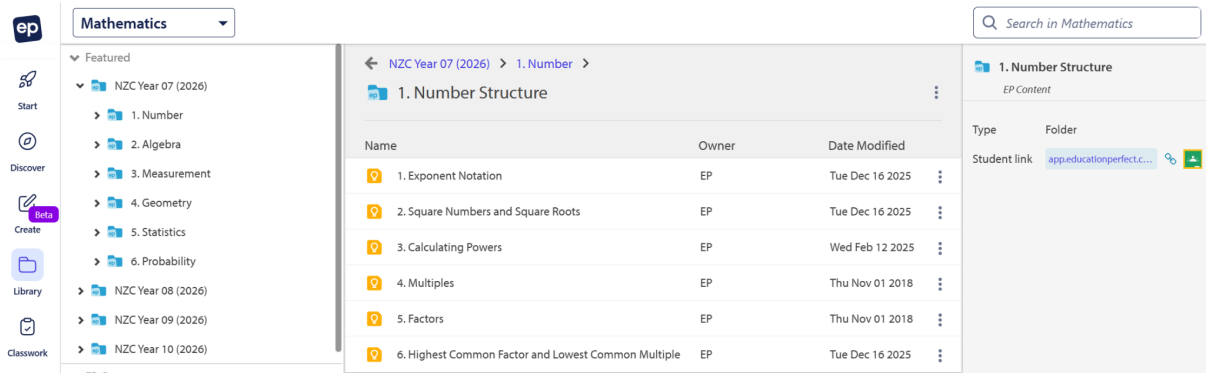
- **Stage 2:** Develop brand-new, purpose-built Years 7-10 courses, with an integrated model of learning, assessment and reporting against the new curriculum. This work will be released iteratively starting with the Number, Algebra and Measurement strands for Years 9-10. These resources will be updated continuously through regular additions with minimal disruption to teachers and students.

This map is to be used for Stage 1 only. We will produce and share updated curriculum maps as Stage 2 progresses.

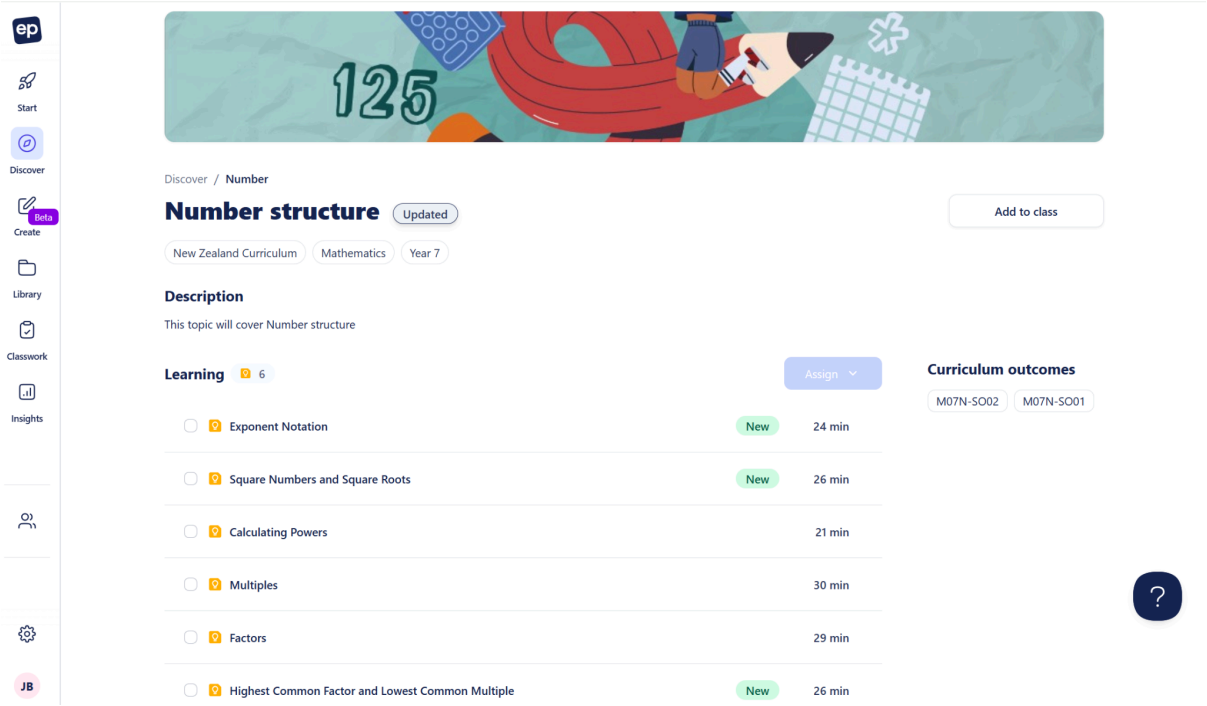
This map is designed to help teachers plan and implement the new NZ Maths curriculum in Years 7-10. It helps you integrate EP's existing resources into your programmes and courses. It also outlines our approach and course structures so you can navigate the platform seamlessly and with confidence.

The map is organised by Year level and strand from the new NZC (e.g. Year 7 Number). In columns one and two, you will recognise the Knowledge and Practices columns from the recently released NZC document. In the third (green) column, 'EP's Code and Descriptor', our team of Maths experts assigns a code that summarises the Knowledge and Practices in each curriculum row. For example, ‘M07N-SO01’ refers to ‘Maths, Year 07, Number - Structures and Operations, row 1’ in the new NZC.

In the fourth column, you will find the EP topics and lessons that align to each curriculum code and descriptor (e.g. *Number structures* on page 1). These topics reflect commonly taught groupings and may allow more flexibility for planning than the broader sub-strands of the NZC. The blue link takes you directly to the relevant EP lesson on the platform. You can also find the full course structure (strands, topics and assessments) in your Content Library:



and your Discover view:



Each lesson is matched to the appropriate EP curriculum code and descriptor. These codes will help you both plan your programmes and track curriculum coverage in Stage 1. **Please note that Stage 1 includes lessons but no assessments**. These will be introduced as Stage 2 is released.

The codes also underpin Stage 2 content, which will include new lessons rich in NZ contexts, alongside purpose-built NZC-aligned assessments. Each assessment question will be tagged to a code and descriptor (i.e. Knowledge and Practices from the NZC). These tags will link to recommended gap-filling lessons to support individual student needs. The data generated through this tagging supports reporting at student, class, cohort and school level, against the new NZC.

Further information and training will be provided during and after the release of Stage 2 content.

We understand that implementing a new curriculum is a challenging time for schools. We believe Education Perfect, through our product, resources and team, can help smooth that transition for teachers and their ākonga. We look forward to working with you for the benefit of all students across the motu.

Mā pango, mā whero, ka oti te mahi.

With black and red together, the work will be done.

New Zealand Curriculum (2026)

7-10 Mathematics

EP Curriculum Map

Year 7 Number

Number structures and operations			
Knowledge **The facts, concepts, principles, and theories to teach.**	**Practices** **The skills, strategies, and applications to teach.**	**EP's Code & Descriptor**	**EP Topics & Lessons**
• 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.	• 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. $34{,}506 = 3 \times 10^4 + 4 \times 10^3 + 5 \times 10^2 + 6$)	**M07N-SO01** Represent whole numbers in expanded form using powers of 10, and use this to compare, order and explain the structure of large numbers.	**Number Structures** Calculating Powers

• 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.
	• 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
		M07N-SO02 Use factors, multiples, and divisibility rules to identify primes, square numbers and square roots, and to find highest common factors and lowest common multiples.	**Number Structures**
			Exponent Notation
			Square Numbers and Square Roots
			Multiples
			Factors
			Highest Common Factor and Lowest Common Multiple

New Zealand Curriculum (2026) | 7-10 Mathematics | EP Curriculum Map

Knowledge	Practices	EP's Code & Descriptor	EP Topics & Lessons
• 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	**M07N-SO03** Use number lines and additive inverses to locate, order, add and subtract integers, including in real world contexts.	**Number Operations** Positive Integers Ordering Negative Integers Adding & Subtracting Integers on the Number Line Rounding Negative Numbers
• 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. $327 \div 5 = 65.4$ or $65\ 2/5$)	**M07N-SO04** Round whole numbers to any specified power of 10 and round decimals to the nearest whole, tenth or hundredth; multiply and divide whole numbers, expressing remainders as whole numbers, fractions, or decimals; use rounding and estimation to predict results and check the reasonableness of calculations.	**Number Operations** Multiplication: Rounding and Compensation Introduction to Rounding Comparing Decimals Round and Estimate with Decimals Introduction To Multiplication Multiplication: Place Value Multiplication: Column Multiplication Introduction To Division Division: Long Division
• 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	**M07N-SO05** Apply the order of operations to evaluate expressions involving multiple operations.	**Number Operations** Order of Operations

New Zealand Curriculum (2026) | 7-10 Mathematics | EP Curriculum Map

Knowledge	Practices	EP's Code & Descriptor	EP Topics & Lessons

• 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. $5/16 = 0.3125$)
  ○ repeating and infinite decimal (e.g. $7/3 = 2.\dot{3}$, $1/7 = 0.\overline{142857}$)
  ○ non-repeating and infinite decimal (e.g. $\sqrt{2} = 1.414213\ldots$).
• 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 %.
	• 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. $5/3$ of 186)
	• Finding a whole amount when given a fraction (e.g. $5/4$ 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)
	• 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?”)
		M07N-SO06 Read, write, represent, compare, order, and convert between fractions, decimals and percentages; find equivalent fractions and simplify fractions; add and subtract decimals and fractions (including improper fractions and mixed numbers); multiply and divide by powers of 10; multiply fractions and decimals by whole numbers; divide fractions by whole numbers and whole numbers by unit fractions; find a fraction or common percentage of a whole number; find a whole when given a fraction or percentage; use proportional reasoning to explore multiplicative relationships between quantities.	**Proportional Reasoning**
			
			Equivalent and Simplified Fractions
			Mixed Numbers and Improper Fractions
			Adding Fractions with a Different Denominator
			Subtracting Fractions with a Different Denominator
			Multiply Fractions
			Divide Fractions
			Mixed Operations with Fractions
			Applications of Fractions
			Adding and Subtracting Decimals Using Place Value
			Multiply and Divide Decimals
			Applications of Decimals
			Percentages of a Quantity
			Express a Quantity as a Percentage
			Convert Between Percentages, Decimals and Fractions

Financial mathematics			
Knowledge	**Practices**	**EP's Code & Descriptor**	**EP Topics & Lessons**
• 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)	**M07N-FM01** Calculate total cost, change, and percentage discounts, using appropriate rounding for New Zealand currency.	**Financial mathematics** Shopping Count the Change Calculating Change Wall Street

Year 7 Algebra

Equations and relationships			
Knowledge	**Practices**	**EP's Code & Descriptor**	**EP Topics & Lessons**

• 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?)
	• Using substitution to find the value of an expression or formula (e.g. calculating $w + 12$ given $w = 4$)
		M07A-ER01 Use variables to represent unknown or changing quantities; use substitution to evaluate an expression or formula; form and solve one- and two-step equations with integer solutions; verify or complete number sentences involving the four operations, including the use of inequalities.	**Algebraic Expressions and Equations**
			
			Introduction to Variables and Expressions
			Substituting Variables
			Algebraic Methods for Solving Linear Equations

Knowledge	Practices	EP's Code & Descriptor	EP Topics & Lessons
• 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 $1b$ ○ 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 $a \times a \times a$ ○ a/b in place of $a \div b$ and $a \times 1/b$ ○ a in place of a^1 ○ 1 in place of a/a when $a \neq 0$.	• 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. $3a + a + a = 5a, 3b - 2b = b$)	**M07A-ER02** Use algebraic notation to express relationships and operations concisely; simplify algebraic expressions involving any of the four operations; rearrange formulae using one or two steps.	**Algebraic Expressions and Equations** Simplifying Addition in Algebra Balancing Equations
• 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 × 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	**M07A-ER03** Plot points in the four quadrants of the coordinate plane; recognise linear patterns in diagrams, tables and graphs and develop a rule for the pattern in words; identify the constant increase or decrease in a linear pattern and represent the rule in an equation; make conjectures about further elements in a linear pattern.	**Linear Relationships** The Cartesian Plane Tables of Values Plot Linear Graphs Linear Patterns and Graphs

Year 7 Measurement

Measuring			
Knowledge	**Practices**	**EP's Code & Descriptor**	**EP Topics & Lessons**
	• 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	**M07M-ME01** Select and use appropriate metric base units (metre, gram, litre) and prefixes such as kilo and centi to represent measurement size.	**Units of Measurement** Unit Prefixes Units of Length Units of Mass Units of Capacity

• 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: $A = ½bh$ or $A = bh/2$
  ○ for a square: $A = l^2$
  ○ for a rectangle: $A = lw$ or $A = bh$.
• Measurement formulae for volume are:
  ○ for a cube: $V = l^3$
  ○ for a rectangular prism: $V = lwh$.
	• 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)
		M07M-ME02 Find unknown values, including with appropriate units, in problems involving: perimeter including in composite shapes; area in rectangles, triangles and composite shapes; volume in rectangular prisms.	**Perimeter, Area and Volume**
			
			Perimeter of Composite Shapes
			Finding the Unknown Side of a Composite Shape
			Area of Composite Shapes
			Calculating Volume of Rectangular Prisms

Knowledge	Practices	EP's Code & Descriptor	EP Topics & Lessons
• 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	**M07M-ME03** Read, interpret, and use timetables and charts involving duration, including the use of fractions of time.	**Units of Measurement** Duration Timetables and Transport

Year 7 Geometry

Shapes			
Knowledge	**Practices**	**EP's Code & Descriptor**	**EP Topics & Lessons**

• 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. o 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.
	• Classifying triangles by both their angle and side properties	**M07G-SH01** Classify triangles by their angle properties (acute, right, obtuse) and side properties (equilateral, isosceles, scalene), recognising key features such as equal sides, equal angles, and special angle measures.	**Triangles and Angles**
			
			Types of Triangles
			Angles in Triangles
			Angles around a Point

Spatial Reasoning			
Knowledge	**Practices**	**EP's Code & Descriptor**	**EP Topics & Lessons**
• 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.	• 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 • 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	**M07G-SR01** Transform shapes in the coordinate plane by a single translation, reflection or rotation; draws nets for prisms and pyramids; reason about unknown angles around a point, on a line, in a triangle, and involving parallel lines and transversals.	**Transformations** Rotation and Reflection of Plane Shapes Translation and Congruence of Plane Shapes Patterns Found in Nature (Year 5-10) **Representing 3D Shapes** Types of Prisms Nets of Prisms Plan and Elevation Views **Triangles and Angles** Introduction to Angles Types of Angles Quadrilaterals Angles on Straight Lines Angles in Corners Vertically Opposite Angles Estimating the Size of Angles
Pathways			
	• 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)	**M07G-PA01** Interpret and communicate positions and pathways using coordinates, angle measures, and the eight main and halfway compass points.	**Positions and Pathways** Using Compasses and Scales Following Compass Directions Locations

Year 7 Statistics

Developing knowledge from data			
Knowledge	**Practices**	**EP's Code & Descriptor**	**EP Topics & Lessons**

• 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
		M07S-KD01 Plan and collect data to answer a statistical question, including an understanding of variable types; calculate mean, median and mode as measures of centre, and range as a measure of spread.	**Data Visualisation and Analysis**
			
			Introduction to Data Collection
			Introduction to Types of Data
			Mean
			Median
			Mode

Visualisation of data			
Knowledge	**Practices**	**EP's Code & Descriptor**	**EP Topics & Lessons**
• 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	**M07S-VD01** Choose and construct an appropriate data display (dot plot, bar graph, time-series graph) to visualise a set of data; identify and explain outliers, including their effect on the mean.	**Data Visualisation and Analysis** Displaying Data Dot Plots and Column (Bar) Graphs Side-by-Side Column Graphs Line Graphs Outliers

Interpretation of data			
Knowledge	**Practices**	**EP's Code & Descriptor**	**EP Topics & Lessons**

• 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
		M07S-ID01 Interpret data visualisations including those from the media and with an understanding of missing or misleading information; respond to statistical questions by describing frequency, shape and outliers, and by calculating and interpreting measures of centre and spread.	**Statistical Investigations**
			
			PPDAC: The Statistical Enquiry Cycle

Year 7 Probability

Experimental probability			
Knowledge	**Practices**	**EP's Code & Descriptor**	**EP Topics & Lessons**
• 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	**M07P-EP01** Carry out chance experiments of varying sizes (at least 30 trials through to at least 100 trials); calculate and compare experimental and theoretical probabilities in order to demonstrate the Law of Large Numbers.	**Probability** Finding Probabilities
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 $(number of ways the event can happen)/(total number of possible outcomes)$. • 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	**M07P-TP01** Use systematic methods (lists, tables, trees) to generate all possible outcomes; calculate and compare probabilities of events as decimals, fractions and percentages, including complementary events.	**Probability** Introduction to Chance

Year 8 Number

Number structures and operations			
Knowledge **The facts, concepts, principles, and theories to teach.**	**Practices** **The skills, strategies, and applications to teach.**	**EP's Code & Descriptor**	**EP Topics & Lessons**
• 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 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. $0.01 = 1/100 = 10^{-2}$)	**M08N-SO01** Represent whole numbers in expanded form using positive and negative powers of 10, and use this to compare, order, and explain the structure of whole numbers and decimals.	**Number Structures** Exponent Notation for Powers of 10
• Each composite number can be represented as a unique product of prime factors and summarised with exponent notation.	• 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. $36 = 2 \times 2 \times 3 \times 3 \times 3 = 2^2 \times 3^3$)	**M08N-SO02** Represent composite numbers as a product of prime factors using powers; evaluate square and cube roots for perfect squares and cubes, and use a calculator to approximate them for other numbers.	**Number Structures** Squares and Cubes Multiples Factors Highest Common Factor & Lowest Common Multiple Prime & Composite Numbers Prime Factors Zombie Outbreak (Year 8-10)
• 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 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. $3 + -7$)	**M08N-SO03** Use number lines to locate, order, add and subtract positive and negative numbers, including in real world contexts.	**Number Operations** Compare and Order Integers Comparing Decimals Add and Subtract Integers Magic Squares

Knowledge	Practices	EP's Code & Descriptor	EP Topics & Lessons
• 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, 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. $327 \div 15 = 21.8$ or $21\ 4/5$)	**M08N-SO04** Round whole numbers to any specified power of 10 and round decimals to the nearest whole, tenth, hundredth or thousandth; multiply and divide whole numbers, expressing remainders as whole numbers, fractions, or decimals; use rounding, estimation and benchmarks to predict results and check the reasonableness of calculations.	**Number Operations** Multiply and Divide Integers Division: Long Division Short Division - Without Remainders Short Division - With Whole Number Remainders Estimation
• 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 (× and ÷), and additive (+ and −) can be used to remember the order of operations.	• Evaluating expressions with integers, using the order of operations	**M08N-SO05** Apply the order of operations to evaluate expressions involving integers and multiple operations.	**Number Operations** Order of Operations with Integers

Knowledge	Practices	EP's Code & Descriptor	EP Topics & Lessons
• 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 • 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 $2/5$ of 42, $2/5 \times 42 = 84/5 = 16\ 4/5$) • 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 $3/5$ of a set, $8 \times 5/3 = 13\ 1/3$) • 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	**M08N-SO06** Read, write, represent, compare, order, and convert between fractions, decimals and percentages; multiply two fractions and a fraction by a whole number (including improper fractions and mixed numbers); multiply and divide by powers of 10; multiply a decimal by a whole number; find a fraction or percentage of a whole number; find a whole when given a fraction or percentage; express the division of a quantity as a ratio, and divide a quantity using a ratio.	**Proportional Reasoning** Simplifying Fractions Mixed and Improper Fractions Add and Subtract Fractions Converting Between Percentages, Fractions and Decimals: Introducing Eighths and Thirds Applications of Fractions Calculate Percentages Convert between Percentages, Fractions and Decimals Introduction to Ratios Simplify Ratios Divide Quantities Using Ratios Applications of Ratios Multiplying Decimals

Financial mathematics			
Knowledge	**Practices**	**EP's Code & Descriptor**	**EP Topics & Lessons**
• 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.	• 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 × $180) = $117)	**M08N-FM01** Create and compare financial plans such as savings, budgets, and payment options; apply percentage discounts to dollar amounts using appropriate rounding for New Zealand currency.	**Financial Mathematics** Introduction to Budgets Best Buys Using Unit Costs Payment Options Budgets and Savings Planning a Party

Year 8 Algebra

Equations and relationships			
Knowledge	**Practices**	**EP's Code & Descriptor**	**EP Topics & Lessons**

• 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 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 $w = 4$)
		M08A-ER01 Use substitution to evaluate an expression or formula; form and solve linear equations with rational solutions; form and solve linear inequalities, representing the solution on a number line.	**Algebraic Expressions and Equations**
			
			Substituting Variables
			Simplifying Addition in Algebra
			Simplifying Multiplication in Algebra
			Introduction to Expanding
			Introduction to Factorising
			Algebraic Methods for Solving Linear Equations
			Linear Word Problems

New Zealand Curriculum (2026) | 7-10 Mathematics | EP Curriculum Map

Knowledge	Practices	EP's Code & Descriptor	EP Topics & Lessons
• 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 • 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. $5x-35=5(x-7)$)	**M08A-ER02** Simplify algebraic expressions involving any of the four operations; expand and factorise single brackets; rearrange formulae using one or two steps.	**Algebraic Expressions and Equations** The Commutative Law The Associative Law The Distributive Law
• 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	**M08A-ER03** Plot points in the four quadrants of the coordinate plane; recognise linear patterns in diagrams, tables and graphs and develop a rule for the pattern in words; identify the constant increase or decrease in a linear pattern and represent the rule in an equation; make conjectures about further elements in a linear pattern; investigate the patterns of triangular, square and cube numbers.	**Linear Relationships** The Cartesian Plane Tables of Values Plot Linear Graphs Linear Patterns and Graphs Describing Graphs Predicting Future Terms

Year 8 Measurement

Measuring			
Knowledge	**Practices**	**EP's Code & Descriptor**	**EP Lessons**
• 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 $1\ m^3\ =\ 1000\ L$.	• 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)	**M08M-ME01** Estimate and measure length, area, volume, capacity, mass, temperature, time, and angle using appropriate units; convert between metric units including for area, and for volume and capacity.	**Units of Measurement** Metric Units and Reading Scales Comparing Units of Length Converting Further Units of Mass Converting Between Units of Area Capacity and Volume
• The area of a parallelogram is given by $A\ =\ bh$ • The area of a trapezium is given by $A = 1/2(a + b)h$ or $A = (a + b)h/2$. • The volume of a triangular prism is given by $V\ =\ 1/2bhl$	• 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	**M08M-ME02** Calculate the area of parallelograms and trapeziums; find unknown values that relate length/perimeter with area; calculate the volume of triangular prisms and of composite figures.	**Perimeter, Area and Volume** 1. Calculating the Perimeter of a Shape with an Unknown Side Area of Composite Shapes Volume of Composite Shapes Calculating Volume of Triangular Prisms Playdough Prisms Toothpick Houses (Year 5-10)
• Duration questions can involve fractions of time and converting between units of time.	• 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)	**M08M-ME03** Read, interpret, and use timetables and charts involving duration; solve problems involving time that include the use of fractions of time and unit conversions.	**Units of Measurement** Duration Speed, Distance and Time Timelines

Year 8 Geometry

Shapes			
Knowledge	**Practices**	**EP's Code & Descriptor**	**EP Lessons**
• 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.	• Identifying and describing the parts of a circle: the radius, diameter, and circumference	**M08G-SH01** Identify and describe radius, diameter and circumference as key parts of a circle.	**Circles and Angles** Parts of a Circle
Spatial reasoning			
• 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.	• Transforming $2D$ shapes on the coordinate plane, including composite shapes, by a combination of translations, reflections, rotations, and scaling by any factor • 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	**M08G-SR01** Transform composite 2D shapes in the coordinate plane by a combination of translation, reflection, rotation and scaling; prove that the interior angle sum of a triangle is $180°$ and generalise a rule for the interior angle sum and exterior angles for any polygon; reason about unknown angles in situations involving polygons.	**Transformations** Rotation and Reflection of Plane Shapes Translation and Congruence of Plane Shapes **Circles and Angles** Angles around a Point Angles on Straight Lines Angles in Triangles Angles in Quadrilaterals Polygons and Interior Angles Angles around Parallel Lines

Pathways			
Knowledge	**Practices**	**EP's Code & Descriptor**	**EP Lessons**
• A map's scale is the ratio between a distance on the map and the corresponding distance in the physical world.	• Using map scales, compass points, distance, and turn to interpret and communicate positions and pathways in coordinate systems and grid reference systems	**M08G-PA01** Use map scales, compass points, distance, and turn to interpret and communicate positions and pathways in coordinate systems and grid reference systems.	**Positions and Pathways** Using Compasses and Scales Following Compass Directions Locations

Year 8 Statistics

Developing knowledge from data			
Knowledge	**Practices**	**EP's Code & Descriptor**	**EP Lessons**

• 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
		M08S-KD01 Plan and collect data to answer a statistical question, including an understanding of variable types; calculate mean, median and mode as measures of centre, and range as a measure of spread.	**Data Visualisation and Analysis**
			
			The Mean
			The Median
			The Mode
			The Range
			Quartiles
			Types of Data
			Collecting Data: Primary and Secondary

Visualisation of data			
Knowledge	**Practices**	**EP's Code & Descriptor**	**EP Lessons**
• 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	**M08S-VD01** Choose and construct an appropriate data display (dot plot, bar graph, time-series graph) to visualise a set of data; identify and explain outliers, including their effect on the mean.	**Data Visualisation and Analysis** Outliers Pick Your Display Method Introduction to Time Series Lolly Graphs

Interpretation of data			
Knowledge	**Practices**	**EP's Code & Descriptor**	**EP Lessons**

• 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
		M08S-ID01 Interpret data visualisations including those from the media and with an understanding of missing or misleading information; respond to statistical questions by describing frequency, shape and outliers, and by calculating and interpreting measures of centre and spread.	**Statistical Investigation**
			
			1. PPDAC: The Statistical Enquiry Cycle

Year 8 Probability

Experimental probability			
Knowledge	**Practices**	**EP's Code & Descriptor**	**EP Lessons**
• 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	**M08P-EP01** Carry out chance experiments of varying sizes (at least 30 trials through to at least 100 trials); calculate and compare experimental and theoretical probabilities in order to demonstrate the Law of Large Numbers.	**Probability** Finding Probabilities A Tree Snake Chance Game The Probability of Observations
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 $(number of ways the event can happen)/(total number of possible outcomes)$. • 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	**M08P-TP01** Use systematic methods (lists, tables, trees) to generate all possible outcomes; calculate and compare probabilities of events as decimals, fractions and percentages, including complementary events.	

Year 9 Number

Number structures and operations			
Knowledge **The facts, concepts, principles, and theories to teach.**	**Practices** **The skills, strategies, and applications to teach.**	**EP's Code & Descriptor**	**EP Topics & Lessons**
• A number written in scientific notation has the form $a \times 10^k$, where $1 \leq a < 10$ 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 $3/3$, 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.	• Identifying, reading, writing, representing, comparing, ordering, and converting between fractions, decimals, and percentages • 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. $3^{-2} = 1/9$) • 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)	**M09N-SO01** Read, write, represent, compare, order, and convert between fractions, decimals and percentages; find equivalent fractions and simplify fractions, including conversion between mixed numbers and improper fractions; express remainders from division as fractions or decimals; convert between negative powers and unit fractions; represent and compare whole and decimal numbers using scientific notation; identify powers of 2 through 2^{10}; approximate the location of roots on the number line.	**Number Structures** Decimal Place Value Comparing Decimals on the Number Line Multiples Factors Highest Common Factor & Lowest Common Multiple Prime & Composite Numbers Prime Factors Calculating Powers Positive and Negative Integer Indices Square Roots Introduction to Scientific Notation (Standard Form) - Large Numbers Introduction to Scientific Notation (Standard Form) - Small Numbers Mixed Numbers and Improper Fractions
• Rounding and estimation support efficiently predicting results and checking the reasonableness of calculations.	• Using rounding and estimation to predict results and to check the reasonableness of calculations • Rounding to the degree of precision required for the context	**M09N-SO02** Round to the degree of precision required for the context; use rounding and estimation to predict results and check the reasonableness of calculations.	**Number Operations** Rounding Negative Numbers Rounding Based on Given Values Consequences of Rounding

Knowledge	Practices	EP's Code & Descriptor	EP Topics & Lessons
• 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 ($\times$ and $\div$), Additive ($+$ and $-$)—can be used to remember the order of operations. • Every non-zero number has a multiplicative inverse (reciprocal), and their product is 1 (e.g. 5 and $1/5$ are reciprocals, so $5 \times 1/5 = 1/5 \times 5 = 1$).	• 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. $0.3 \times 0.15 = 3/10 \times 15/100$). • Checking for equivalence in expressions involving negative numbers (e.g. $-3^2 \neq -3^2$, $-2 + 3 = 3 + -2$, $2 \times -3 = -3 \times 2 = -2 \times 3$, $2/-3 = -2/3 = -2/3$)	**M09N-SO03** Add, subtract, multiply and divide integers, including using the order of operations; check the equivalence in expressions involving negative numbers; generalise about exponents of 0 and 1; add, subtract, multiply and divide fractions and decimals; generalise the rule for dividing by a fraction; connect multiplying or dividing decimals with multiplying or dividing their fraction equivalents.	**Number Operations** Adding Negative Numbers Subtracting Negative Numbers Multiply and Divide Integers Order of Operations with Integers Add and Subtract Decimals Add and Subtract Fractions Multiply and Divide Decimals Multiply and Divide Fractions

New Zealand Curriculum (2026) | 7-10 Mathematics | EP Curriculum Map

Knowledge	Practices	EP's Code & Descriptor	EP Topics & Lessons

• 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
		M09N-SO04 Find a fraction or percentage of a number; find the whole amount, given a fraction or percentage; express a number as a fraction or percentage of another; increase or decrease a number by a given proportion; represent and simplify ratios; divide a quantity using a ratio; find equivalent ratios or rates by scaling up or down.	**Proportional Reasoning**
			
			Convert between Fractions, Decimals and Percentages
			Fractions of an Amount
			Percentages of a Quantity
			Solving Fraction Problems
			Increase and Decrease by a Percentage
			Introduction to Ratios
			Divide Quantities Using Ratios
			Introduction to Rates

Number structures and operations			
• 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)	**M09N-FM01** Apply percentages, ratios, rates, and proportions in financial contexts, calculating mark-ups, discounts, simple interest, and GST.	**Financial Mathematics** Calculating Discounts Introduction to Interest Calculating Simple Interest Goods and Services Tax

Year 9 Algebra

Equations and relationships			
Knowledge	**Practices**	**EP's Code & Descriptor**	**EP Topics & Lessons**

• 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)
		M09A-ER01 Simplify algebraic expressions involving the four operations, including positive integer powers; expand single brackets and factorise using common factors; form and solve linear equations with rational coefficients and linear inequalities with positive coefficients; rearrange fomulae.	**Algebraic Expressions and Equations**
			
			Substituting Variables
			Add and Subtract Algebraic Expressions
			Multiply and Divide Algebraic Expressions
			Expand Algebraic Expressions
			Factorise Algebraic Expressions
			Algebraic Methods for Solving Linear Equations
			Rearrange Algebraic Expressions
			Inequalities

Knowledge	Practices	EP's Code & Descriptor	EP Topics & Lessons

• 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 $(0, c)$.
• In the equation of a line 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 $y = c$.
	• 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
		M09A-ER02 Plot and connect points from a rule of the form $y = mx + c$ to form a linear graph; recognise linear patterns in diagrams, tables and graphs and develop a rule for the pattern in words; identify the values of m and c in the table or graph of a linear pattern and use these to represent the rule in an equation; make conjectures about further elements in a linear pattern.	**Linear Relationships**
			
			The Cartesian Plane
			Graph Linear Relationships
			Determine the Rule for a Linear Relationship
			Horizontal and Vertical Lines
			Describing Graphs
			Effect of Variation in the Parameters of Linear Functions
			Model with Linear Functions

Year 9 Measurement

Measuring			
Knowledge	**Practices**	**EP's Code & Descriptor**	**EP Lessons**
• 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	**M09M-ME01** Estimate, calculate, convert, and accurately represent measurements, recognising that results of calculations cannot be more precise than the least precise value used.	*Resources under development*
• 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, 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	**M09M-ME02** Select and use appropriate metric units for a given context; convert between metric units, using the appropriate prefixes.	**Measurement Precision and Scale** Converting Units of Length Units of Mass Converting Units of Capacity Converting Units of Volume Applications of Converting Units of Capacity

New Zealand Curriculum (2026) | 7-10 Mathematics | EP Curriculum Map

Knowledge	Practices	EP's Code & Descriptor	EP Lessons

• The constant π is found by dividing a circle's circumference by its diameter.
• For a circle of radius r, the circumference is 2πr.
	• 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
		M09M-ME03 Find the perimeter of $2D$ shapes; find the circumference of circles and the perimeter of half and quarter circles; find the area of parallelograms, trapeziums and kites, relating their formulae to the formula for the area of rectangle.	**Perimeter and Area**
			
			Perimeter of Composite Shapes
			Calculating the Perimeter of a Shape with an Unknown Side
			Circumference of Circles
			Area of Composite Shapes
			Area of Parallelograms
			Volume of Composite Shapes

• 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
		M09M-ME04 Prove Pythagoras' theorem and use it to verify if a triangle is right-angled; identify Pythagorean triples including finding another triple from a given Pythagorean triple; use Pythagoras' theorem to find the length of the hypotenuse, given the length of the other two sides.	**Pythagoras' Theorem**
			
			Parts of a Triangle and the Hypotenuse
			Pythagoras' Theorem

• There is a fixed relationship between speed, distance, and time: $speed = distance/time$. • In position-time graphs, the gradient represents speed.	• Finding distance, given speed and time • Finding time, given distance and speed	**M09M-ME05** Use the relationship $speed = distance/time$ to find distance or time, given the other two; interpret the gradient of a position-time graph as speed.	**Rates** Speed Plotting and Reading Travel Graphs Analysing Travel Graphs Applications of Linear Graphs

Knowledge	Practices	EP's Code & Descriptor	EP Lessons
• 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	**M09M-ME06** Reason about durations using different units of time, including decimal fractions of milliseconds when appropriate.	***Resources under development***

Year 9 Geometry

Shapes			
Knowledge	**Practices**	**EP's Code & Descriptor**	**EP Lessons**
• 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.	• 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	**M09G-SH01** Identify, describe and relate parts of a circle including radius, diameter, circumference and chords; reason about unknown angles involving intersecting lines, and parallel lines and transversals.	**Circles and Angles** Parts of a Circle Angles in Corners Angles on Straight Lines Angles Around a Point Vertically Opposite Angles Angles in Triangles Polygons and Interior Angles Polygons and Exterior Angles Angles around Parallel Lines Applications of Geometric Reasoning

Spatial reasoning			
Knowledge	**Practices**	**EP's Code & Descriptor**	**EP Lessons**
• 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	**M09G-SR01** Represent and construct rectangular and triangular prisms and pyramids from nets and plan views; transform 2D shapes in the coordinate plane by translation, reflection across a given point of symmetry, and rotation about a given point.	**Representing 3D Objects** Polyhedra Pyramids Nets of Pyramids Identifying Faces of Prisms and Pyramids Plan and Elevation Views **Transformations** Introduction to Congruence Translation and Congruence of Plane Shapes Rotation and Reflection of Plane Shapes Scaling on Cartesian Planes

Year 9 Statistics

Developing knowledge from data			
Knowledge	**Practices**	**EP's Code & Descriptor**	**EP Lessons**

• 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.
	• 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: o the minimum value
	  ○ the value of quartile 1, or Q1
	  ○ the value of the median or quartile 2, or Q2
	  ○ the value of quartile 3, or Q3
	  ○ the maximum value
	• Calculating the interquartile range as IQR = Q3 − Q1
		M09S-KD01 Understand that statistical questions include comparisons, relationships and time-series; plan and collect multivariate data to answer a statistical question, including an understanding of variable types; calculate five-point summaries and interquartile range for numerical data.	**Data visualisation and analysis**
			
			Displaying Data
			Primary and Secondary Data
			Introduction to Data Collection
			Experiment and Observation
			The Mean
			The Median
			The Mode
			The Range
			Effect of Shape on Mean and Median
			Comparing Dot Plots
			Comparing Box and Whisker Plots
			Clusters and Outliers

Visualisation of data			
Knowledge	**Practices**	**EP's Code & Descriptor**	**EP Lessons**
• 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	**M09S-VD01** Create appropriate data visualisations that show patterns, trends and variation for an investigation (including dot plots and bar graphs, frequency tables and histograms, box plots, scatter plots and time-series graphs).	**Data visualisation and Analysis** Dot Plots and Column (Bar) Graphs Box and Whisker Plots

• 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)	**M09S-VD02** For relationship investigations, understand explanatory (independent) vs response (dependent) variables, draw lines or curves of best fit, and predict values for the response variable for given values of the explanatory variable.	**Data visualisation and Analysis**
			
			Introduction to Bivariate Data
			Analysing Scatterplots
			Introduction to Time Series

Interpretation of data			
Knowledge	**Practices**	**EP's Code & Descriptor**	**EP Lessons**
• 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	**M09S-ID01** Critically evaluate data visualisations and claims, including those from the media, to see if they are reliably supported by the data or are a misrepresentation.	***Resources under development***
• Data visualisations need to be critically assessed to see if they support or misrepresent the data.	• 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	**M09S-ID02** Communicate findings in context and with evidence to answer a statistical question; compare findings to initial conjectures and provide possible explanations; evaluate findings and data collection methods to check the validity of claims.	**Statistical Investigations** PPDAC: The Statistical Enquiry Cycle Evaluating Statistical Reports and Claims: Data Reporting

Year 9 Probability

Knowledge	Practices	EP's Code & Descriptor	EP Lessons
• 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	**M09P-PR01** Systematically list outcomes and probabilities for the sample space; calculate probabilities of joint events including dependence and independence; carry out chance experiments, including digital simulations; compare experimental and theoretical probabilities including an understanding of the effect of increasing the number of trials; create, describe and use visualisations for probabilities distributions.	**Probability** Introduction to Probability Experimental Probability Two-Way Tables Using Two-Way Tables Probability Trees

Year 10 Number

Number structures and operations			
Knowledge **The facts, concepts, principles, and theories to teach.**	**Practices** **The skills, strategies, and applications to teach.**	**EP's Code & Descriptor**	**EP Topics & Lessons**

• 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:
  ○ $a^m * a^n = a^{m+n}$ (the product-of-exponents rule)
  ○ $a^m/a^n = a^{m-n}$ (the quotient-of-exponents rule)
  ○ $(am)^n = a^{m*n}$ (the exponent-of-exponents rule)
  ○ $(a^{-m} = 1/a^m$ $(a \neq 0)$ (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:
  ○ $\sqrt{a} \times \sqrt{a} = a$
  ○ $\sqrt{a} \times \sqrt{b} = \sqrt{ab}$
  ○ $\sqrt{a} \div \sqrt{a} = 1$
  ○ $\sqrt{a} \div \sqrt{b} = \sqrt{a/b} = \sqrt{a}/\sqrt{b} \times \sqrt{b}/\sqrt{b} = \sqrt{(ab)/b}.$
	• Identifying, reading, writing, representing, comparing, ordering, and converting between fractions, decimals, and percentages
	• Recording, comparing, ordering, and calculating with numbers in scientific notation
	• Identifying irrational numbers (e.g. cube root of $\sqrt[3]{10}, \pi$)
	• 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.
		M10N-SO01 Read, write, represent, compare, order, and convert between fractions, decimals and percentages; compare and calculate with numbers in scientific notation; identify irrational numbers, including in square and cube roots; calculate using the exponent rules with integer exponents; calculate exactly using fractions, multiples of π, and roots, including using the laws of roots.	**Number Structures**
			
			Index Notation
			Introduction to Irrational Numbers
			Approximating Irrational Numbers
			Applications of Irrational Numbers
			Square Roots
			Square Roots of Non-Perfect Squares
			Positive and Negative Integer Indices

Knowledge	Practices	EP's Code & Descriptor	EP Lessons

• 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.
	• Using rounding, including to specified significant figures, and estimation to predict results and to check the reasonableness of calculations
	• Rounding to the degree of precision required for the context
		M10N-SO02 Round to the degree of precision required for the context, including the use of significant figures; use rounding and estimation to predict results and check the reasonableness of calculations.	**Number Operations**
			
			Ordering Numbers and Estimating Calculations in Scientific Notation (Standard Form)
			Adding and Subtracting with Scientific Notation (Standard Form)
			Multiplying and Dividing in Scientific Notation (Standard Form)
			Terminating Decimals and Rounding
			Recurring Decimals
			Significant Figures and Scientific Notation (Standard Form)

• 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 ($\times$ and $\div$), Additive ($+$ and $-$)—can be used to remember the order of operations.
• Every non-zero number has a multiplicative inverse (reciprocal), and their product is 1 (e.g. 5 and $1/5$ are reciprocals, so $5 \times 1/5 = 1/5 \times 5 = 1$).
	• 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, $(-1)^4$
		M10N-SO03 Add, subtract, multiply and divide positive and negative numbers, including fractions and decimals and multiple operations; evaluate positive integer exponents for positive and negative numbers.	**Number Operations**
			
			Order of Operations with Integers
			Adding and Subtracting Decimals
			Multiplying Decimals
			Dividing Decimals
			Adding Fractions with a Different Denominator
			Subtracting Fractions with a Different Denominator
			Multiplying Fractions
			Dividing Fractions

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Knowledge	Practices	EP's Code & Descriptor	EP Topics & Lessons

• 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
	• 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)
		M10N-SO04 Find a fraction or percentage of a number; find the whole amount, given a fraction or percentage; express a number as a fraction or percentage of another; increase or decrease a number by a given proportion; calculate percentage increase or decrease between two numbers; compare and use ratios and rates.	**Proportional Reasoning**
			
			Converting Between Further Percentages, Decimals, and Fractions
			Calculate Percentages
			Percentage Increase and Decrease
			Divide Quantities Using Ratios
			Applications of Ratios
			Rates

Financial mathematics			
• Percentages, ratios, rates, and proportions are often applied in financial situations.	• 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?)	**M10N-FM01** Use exchange rates to convert between New Zealand dollars and other currencies; calculate proportions of costs; calculate simple and compound interest for short time periods.	**Financial Mathematics** When a Best Buy isn't the Best Option Best Buys Using Unit Costs Calculating Simple Interest Compound Interest Basic Formula Exchange Rates

Year 10 Algebra

Equations and relationships			
Knowledge	**Practices**	**EP's Code & Descriptor**	**EP Topics & Lessons**

• 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.
• 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. $\sqrt{16} = 4$).
  ○ 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 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:
  ○ $x(x+a) = x^2 + ax$
	• 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 (e.g. $-2/5x + 5 \leq -10$), 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. $A = \pi r^2$, $c^2 = a^2 + b^2$)
		M10A-ER01 Simplify algebraic expressions involving the four operations, including positive integer powers; expand single brackets and factorise using common factors; expand two brackets, and factorise quadratic expressions with a leading coefficient of 1; form and solve linear equations and inequalities with rational coefficients, representing the solution on a number line; solve quadratic equations in factorised or $x2 + c$ form, connecting solutions to x-intercepts of the related graph; rearrange formulae that involve squares or square roots.	**Algebraic Expressions and Equations**
			
			Substitution
			Adding and Subtracting Like Terms
			Exponent Laws for Multiplication and Division
			Exponent Laws for Powers
			Introduction to Algebraic Powers
			Zero Exponent Law
			Negative Exponents
			Combine Exponent Laws
			Expanding Single Brackets
			Factorising to Single Brackets
			Solve Linear Equations
			Introduction to Quadratic Relationships
			Solve Quadratic Equations with Two Terms
			Expand Binomial Products
			Solve Quadratic Equations with Three Terms

○ difference of two squares: $(x + a)(x - a) = x^2 - a$ ○ 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.			
Knowledge	**Practices**	**EP's Code & Descriptor**	**EP Lessons**
• 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). • The gradient m of a straight line can be determined with the formula m = rise/run =Δy/Δx. • A vertical line has an infinite gradient. This cannot be expressed in the formula m = rise/run as it becomes m = rise/0, which cannot be evaluated. • The equation of a vertical line is x = b, where the x-intercept is (b, 0).	• 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		**Linear and Quadratic Relationships** Intro to Linear Equations Sketch Linear Graphs Using Intercept Method Gradient of a Straight Line Sketch Linear Graphs Using Gradient-Intercept Method Determine Rules of Linear Graphs Applications of Linear Relationships Parabolas

Year 10 Measurement

Measuring			
Knowledge	**Practices**	**EP's Code & Descriptor**	**EP Lessons**
• A solution to a calculation cannot be more precise than the least precise number used in that calculation. • 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.	• Estimating, calculating, converting, and accurately representing measurements using significant figures	**M10M-ME01** Estimate, calculate, convert, and accurately represent measurements using significant figures, ensuring precision of a solution matches the least precise value used.	**Measurement Precision and Scale** Estimating Measurements Rounding Sensibly
• 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, km/h) reflect a relationship—a product or quotient—between two different measurements.	• Converting between metric units, and using the appropriate prefixes in the metric system (e.g. kilo–, mega–, centi–, milli–, micro–)	**M10M-ME02** Convert between metric units in measurement calculations, including appropriate prefixes and the use of derived units.	**Measurement Precision and Scale** Metric Unit Conversions

Knowledge	Practices	EP's Code & Descriptor	EP Lessons

• 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 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
		M10M-ME03 Find the area of circles and composite shapes that include parts of circles; find the surface area of rectangular and triangular prisms, cylinders, pyramids, and composite figures; find the volume/capacity of irregular prisms, cylinders, and pyramids.	**Area, Surface Area and Volume**
			
			Circumference of Circles
			Calculating the Area of Circles
			Using the Area of Circles
			Surface Area of Prisms
			Surface Area of Cylinders
			Surface Area of Complex Solids
			Calculating Volume of Cylinders
			Calculating Volume of Other
			Regular and Irregular Prisms

• 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	**M10M-ME04** Scale 2D and 3D shapes, and determine the scale factor for the scaled shape's perimeter, area or volume.	***Resources under development***

• 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:
	  ○ 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
	$d = \sqrt{\left[\left(x(sub2) - x(sub1)\right)^2 + \left(y(sub2) - y(sub1)\right)^2\right]}$
		M10M-ME05 Use Pythagoras' theorem to verify if a triangle is right-angled; find the length of any unknown side in a right-angled triangle; derive and use the distance formula to calculate the distance between two points in the coordinate plane.	**Pythagoras' Theorem**
			
			Pythagoras's Theorem
			Distance and Pythagoras' Theorem

Knowledge	Practices	EP's Code & Descriptor	EP Lessons
• There is a fixed relationship between speed, distance, and time: speed =distance/time. • In position-time graphs, the gradient represents speed.	• Finding speed, distance, or time, given any two of the measurements	**M10M-ME06** Use the relationship speed=distance/time to find speed, distance, or time, given any two of the values; interpret the gradient of a position-time graph as speed.	**Rates** Speed Plotting and Reading Travel Graphs Analysing Travel Graphs Applications of Linear Graphs
• 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	**M10M-ME07** Reason about durations using different units of time, including decimal fractions of milliseconds where appropriate.	***Resources under development***

Year 10 Geometry

Shapes			
Knowledge	**Practices**	**EP's Code & Descriptor**	**EP Lessons**
• In similar shapes, corresponding angles are equal and the lengths of corresponding sides are proportional. • Congruent shapes are identical in shape and size.	• Using the properties of similarity in 2D shapes, including right-angled triangles, to find unknown lengths and angles	**M10G-SH01** Use similarity in 2D shapes, including right-angled triangles, to find unknown lengths and angles.	**Congruence and Similarity** Introduction to Similarity Similarity Tests Similarity and Angles Similarity and Multiple Triangles Similar Triangles and Ratios
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 cylinders, from nets • Transforming 2D shapes, including composite shapes, by resizing them by any scale factor	**M10G-SR01** Represent and construct 3D shapes, including cylinders, from nets; transform composite 2D shapes, including resizing them by any scale factor.	**Representing 3D Objects** Nets of Prisms **Transformations** Rotation and Reflection of Plane Shapes Translation and Congruence of Plane Shapes Scaling on Cartesian Planes

Year 10 Statistics

Developing knowledge from data			
Knowledge	**Practices**	**EP's Code & Descriptor**	**EP Lessons**

• 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 using a sample or census
	• Reasoning why a mean or median would be a better measure of central tendency for a given statistical question
		M10S-KD01 Plan and collect multivariate data using a census or reliable sample to answer a statistical question; select and explain whether the mean or median is a better measure of centre to answer a given statistical question.	**Data Visualisation and Analysis**
			
			Evaluating Statistical Graphs:
			Making our Graph
			Introduction to Time Series
			Calculating Measures of Centre and Spread
			Effect of Shape on Mean and Median
			Quartiles
			Interquartile Range
			Bias in Data
			Samples and Populations

Visualisation of data			
Knowledge	**Practices**	**EP's Code & Descriptor**	**EP Lessons**
• 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	**M10S-VD01** Create appropriate data visualisations that show patterns, trends and variation for an investigation (including dot plots and bar graphs, frequency tables and histograms, box plots, scatter plots and time-series graphs).	**Data Visualisation and Analysis** Introduction to Bivariate Data
• 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)	**M10S-VD02** For relationship investigations, understand explanatory (independent) vs response (dependent) variables, draw lines or curves of best fit, and predict values for the response variable for given values of the explanatory variable.	**Data Visualisation and Analysis** Scatterplots Gathering and Plotting Time Series Data Long-term Trends Seasonal Trends and Cyclic Effects

Interpretation of data			
Knowledge	**Practices**	**EP's Code & Descriptor**	**EP Lessons**
• 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	**M10S-ID01** Critically evaluate data visualisations and claims, including those from the media, to see if they are reliably supported by the data or are a misrepresentation.	**Statistical investigation** PPDAC: The Statistical Enquiry Cycle Evaluating Statistical Graphs: the Shape of the Graph Evaluating Statistical Reports and Claims: Data Collection Evaluating Statistical Reports and Claims: Data Reporting
• 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 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	**M10S-ID02** Communicate findings in context with evidence and awareness of variability to answer a statistical question; make informal inferences in comparison situations based on visual considerations and the 75%-to-50% rule; make informal predictions from scatterplots in relationship situations.	

Year 10 Probability

Experimental and theoretical probability			
Knowledge	**Practices**	**EP's Code and Descriptor**	**EP Lessons**
• 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	**M10P-PR01** Systematically list outcomes and probabilities for the sample space; calculate probabilities of joint events including dependence and independence; carry out chance experiments, including digital simulations; compare experimental and theoretical probabilities including an understanding of the effect of increasing the number of trials; create, describe and use visualisations for probabilities distributions.	**Probability** Review: Probability Complementary Events Calculating Complements Describing Probabilities Using Descriptions of Probability Two-Way Tables Using Two-Way Tables