The New Zealand Curriculum

# Mathematics and Statistics Year 10

October 2025

# Contents

# Purpose statement

*Ānō me he whare pūngāwerewere.*

*Behold, it is like the web of a spider.*

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

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

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

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

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

# Learning area structure

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

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

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

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

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

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

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

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

# Introduction

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

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

## Years 0–3

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

## Years 4–6

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

## Years 7–8

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

## Years 9–10

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

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

The New Zealand Curriculum

# Mathematics and Statistics

## Year 10 teaching sequence

# Number

| Year 10 | | |
|---|---|---|
| | **Knowledge**<br>*The facts, concepts, principles, and theories to teach.* | **Practices**<br>*The skills, strategies, and applications to teach.* |
| **Number structures and operations** | • Non-repeating, infinite decimals are irrational numbers; some of them are represented by special symbols, such as $\sqrt{2}$ and $\pi$.<br>• The terms index, power, and exponent are used interchangeably.<br>• For the number $a^n$, $a$ represents the base, and $n$ represents the exponent.<br>• Exponent rules govern how operations involving exponents work and include:<br>○ $a^m \times a^n = a^{m+n}$ (the product-of-exponents rule)<br>○ $\frac{a^m}{a^n} = a^{m-n}$ (the quotient-of-exponents rule)<br>○ $(a^m)^n = a^{m \times n}$ (the exponent-of-exponents rule)<br>○ $a^{-m} = \frac{1}{a^m}, (a \neq 0)$ (the negative exponent rule)<br>○ $a^0 = 1$ $(a \neq 0)$ (the zero exponent rule).<br>• Only like roots can be added and subtracted; multiples of a root are represented with coefficients (e.g. $\sqrt{3} + \sqrt{3} = 2\sqrt{3}$).<br>• There are rules for working with roots, including not leaving roots in a denominator:<br>○ $\sqrt{a} \times \sqrt{a} = a$<br>○ $\sqrt{a} \times \sqrt{b} = \sqrt{ab}$<br>○ $\sqrt{a} \div \sqrt{a} = 1$<br>○ $\sqrt{a} \div \sqrt{b} = \sqrt{\frac{a}{b}} = \frac{\sqrt{a}}{\sqrt{b}} \times \frac{\sqrt{b}}{\sqrt{b}} = \frac{\sqrt{ab}}{b}$. | • Identifying, reading, writing, representing, comparing, ordering, and converting between fractions, decimals, and percentages<br>***This content is to be taught across Years 9 and 10.***<br><br>• Recording, comparing, ordering, and calculating with numbers in scientific notation<br>• Identifying irrational numbers (e.g. $\sqrt[3]{10}, \pi$)<br>• Generalising about whether square and cube roots of whole numbers are rational or irrational<br>• Calculating using integer exponents<br>• Calculating exactly using fractions, roots, and multiples of $\pi$ |
| | • The rules for identifying significant figures are:<br>○ all non-zero digits are significant<br>○ zeros appearing anywhere between two non-zero digits are significant<br>○ leading zeros are not significant<br>○ trailing zeros are significant if there is a decimal point present, and are not significant otherwise<br>○ exact numbers have an unlimited number of significant figures.<br>• 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<br><br>• Rounding to the degree of precision required for the context<br>***This content is to be taught across Years 9 and 10.*** |
| | • The order of operations is important when evaluating or forming expressions. Operations are done as follows:<br>1. grouped operations (e.g. expressions under a square root, involving the numerator of a fraction, or inside brackets)<br>2. exponents or powers<br>3. multiplication and division, from left to right<br>4. addition and subtraction, from left to right. | • Adding, subtracting, multiplying, and dividing positive and negative numbers, including fractions and decimals<br>• Evaluating positive integer exponents for positive and negative numbers (e.g. $3^5, (-1)^4$) |

| Year 10 | | |
|---|---|---|
| | **Knowledge**<br>*The facts, concepts, principles, and theories to teach.* | **Practices**<br>*The skills, strategies, and applications to teach.* |
| | • 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.<br>• Every non-zero number has a multiplicative inverse (reciprocal), and their product is 1 (e.g. 5 and $\frac{1}{5}$ are reciprocals, so $5 \times \frac{1}{5} = \frac{1}{5} \times 5 = 1$).<br>***This content is to be taught across Years 9 and 10.*** | |
| | • Percentages are a way of expressing a fraction of 100.<br>• Percentages can be used to proportionally increase or decrease a quantity by multiplication and can be presented as decimal multipliers.<br>○ 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).<br>○ 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).<br>• Ratios show part-to-part or part-to-whole comparisons of two or more quantities.<br>• Ratios can be scaled up or down or simplified.<br>• 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.<br>***This content is to be taught across Years 9 and 10.*** | • Finding a fraction or percentage of a number<br>• Finding the whole amount, given a fraction or percentage (e.g. 20% of an amount is 30. What is the original amount?)<br>• Expressing a number as a fraction or percentage of another number<br>***This content is to be taught across Years 9 and 10.***<br><br>• Applying a proportional increase or decrease to a number<br>• Calculating the percentage increase or decrease between two numbers (e.g. What is the percentage increase between 50 and 75?)<br>• Comparing and using ratios and rate (e.g. finding speed, given distance and time) |
| **Financial mathematics** | • Percentages, ratios, rates, and proportions are often applied in financial situations.<br>***This content is to be taught across Years 9 and 10.*** | • Converting New Zealand dollars into other currencies, and vice versa<br>• Finding proportions of costs (e.g. the price of 400 g of an item, given the cost per kilogram)<br>• Calculating compound interest on dollar amounts, by calculating simple interest month by month for short time periods (e.g. How much do you have after 3 months if you invest $100 at a 2.5%-per-month interest rate?) |

# Algebra

| Year 10 | | |
|---|---|---|
| | **Knowledge**<br>*The facts, concepts, principles, and theories to teach.* | **Practices**<br>*The skills, strategies, and applications to teach.* |
| **Equations and relationships** | • The properties of operations (commutative, distributive, associative, inverse, and identity) and the order of operations apply to numbers and variables. | • Simplifying and manipulating algebraic expressions involving sums, products, differences, and positive integer powers, by: |

<table>
<tr><th colspan="3">Year 10</th></tr>
<tr><td></td><td>Knowledge<br>The facts, concepts, principles, and theories to teach.</td><td>Practices<br>The skills, strategies, and applications to teach.</td></tr>
<tr><td rowspan="4"></td><td>• When operating on or writing equations with fractions, fractions of magnitude greater than 1 are usually written as improper fractions.<br>This content is to be taught across Years 9 and 10.</td><td rowspan="2">○ collecting like terms<br>○ factorising using common factors<br>○ factorising quadratic expressions with a leading coefficient of 1<br>○ 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<br>○ factorising by grouping (i.e. using the distributive law) (e.g. $x^2 + 2x - 8 = x^2 + 4x - 2x - 8 = x(x + 4) - 2(x + 4) = (x - 2)(x + 4)$)<br>• Forming and solving linear equations and linear inequalities with rational number coefficients (e.g. $-\frac{2}{5}x + 5 \leq -10$), giving exact or rounded solutions, and representing the solution on a number line<br>• 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<br>• Substituting into, rearranging, and simplifying expressions or formulae that involve squares or square roots (e.g. $A = \pi r^2$, $c^2 = a^2 + b^2$)</td></tr>
<tr><td>• Multiplying or dividing by a negative number reverses an inequality.<br>• 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).<br>• Finding square roots of numbers and solving quadratic equations are related but have some differences.<br>○ Any positive real number has two square roots: one positive (the principal square root) and one negative (e.g. for 16, 4 and -4).<br>○ The square root operation $\sqrt{\ }$ refers specifically to the principal square root (e.g. $\sqrt{16} = 4$).<br>○ There are 0, 1, or 2 real-number solutions to $x^2 = a$, where $a$ is a number.<br>• The zero product property states that if two expressions multiply to be zero, then at least one expression must be zero (e.g. if $ab = 0$ then either $a$ or $b$ is $0$, or if $(x - a)(x - b) = 0$ then either $(x - a) = 0$ or $(x - b) = 0$).<br>• There are specific factorising relationships that are useful to recognise:<br>○ $x(x + a) = x^2 + ax$<br>○ difference of two squares: $(x + a)(x - a) = x^2 - a^2$<br>○ square of a sum: $(x + a)^2 = x^2 + 2ax + a^2$<br>○ square of a difference: $(x - a)^2 = x^2 - 2ax + a^2$.<br>• The solution to a linear inequality is a set of values which may be represented with a number line.</td></tr>
<tr><td>• For a specific straight line, the gradient, $m$, and $y$-intercept, $c$, are fixed, and $x$ varies with $y$ according to the rule $y = mx + c$.<br>• The $y$-intercept touches the $y$ –axis and has coordinates $(0, c)$.<br>This content is to be taught across Years 9 and 10.</td><td rowspan="2">• Interpreting and graphing linear equations in the form $y = mx + c$, using the gradient and $y$-intercept<br>• Calculating the gradient and $y$ –intercept of a line, using a graph<br>• Comparing the relative magnitude of $m$ in two or more linear graphs, using the concept of steepness and relating it to the magnitude of $m$<br>• Finding the equation of a line, given two points or the gradient and a single point<br>• 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</td></tr>
<tr><td>• The gradient $m$ of a straight line can be determined with the formula $m = \frac{rise}{run} = \frac{\Delta y}{\Delta x}$.<br>• A vertical line has an infinite gradient. This cannot be expressed in the formula $m = \frac{rise}{run}$ as it becomes $m = \frac{rise}{0}$, which cannot be evaluated.<br>• The equation of a vertical line is $x = b$, where the $x$-intercept is $(b, 0)$.</td></tr>
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# Measurement

| Year 10 | | |
|---|---|---|
| | **Knowledge**<br>*The facts, concepts, principles, and theories to teach.* | **Practices**<br>*The skills, strategies, and applications to teach.* |
| **Measuring** | • A solution to a calculation cannot be more precise than the least precise number used in that calculation.<br>***This content is to be taught across Years 9 and 10.*** | • Estimating, calculating, converting, and accurately representing measurements using significant figures |
| | • The number of significant figures in a measurement is the number of digits that contribute to the degree of accuracy of the measurement, given as the number of digits known with certainty plus one uncertain digit.<br>• 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. | |
| | • Conversions between different-sized metric units may be needed to give the appropriate units for a measurement or calculation.<br>• 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.<br>• 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.<br>• Derived units (e.g. $\mathrm{cm}^2$, $\mathrm{km/h}$) reflect a relationship — a product or quotient — between two different measurements.<br>***This content is to be taught across Years 9 and 10.*** | • Converting between metric units, and using the appropriate prefixes in the metric system (e.g. kilo–, mega–, centi–, milli–, micro–) |
| | • The area of a circle is given by $\mathrm{A} = \pi r^2$.<br>• The surface area of a solid object is a measure of the total area that the surface of the object occupies.<br>• 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:<br>○ the area of circles and composite shapes that include circles or semicircles<br>○ the surface area and volume or capacity of prisms, pyramids, and cylinders<br>• Deriving the formulae for the area of half and quarter circles from the formula for a full circle<br>• Deriving the formulae for the surface area of cubes, rectangular prisms, and cylinders<br>• Calculating the area of half circles and quarter circles<br>• Calculating the surface area of cubes, rectangular prisms, triangular prisms, cylinders, and composite figures<br>• Calculating the volume of cylinders and irregular prisms with a consistent cross-sectional area |
| | • Resizing (enlarging or reducing) a shape changes its perimeter, area, or volume proportionally according to the dimensions of the units; linear metric conversions must be squared to convert area and cubed to convert volume. | • Scaling a shape by a factor, and determining the scale factor for the scaled shape’s area or volume |

| Year 10 | | |
|---|---|---|
| | **Knowledge**<br>*The facts, concepts, principles, and theories to teach.* | **Practices**<br>*The skills, strategies, and applications to teach.* |
| | • 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.<br>• If $(a, b, c)$ is a Pythagorean triple, then so is $(ka, kb, kc)$, where $k$ is a positive integer.<br>***This content is to be taught across Years 9 and 10.*** | • Using Pythagoras' theorem to:<br>○ find the length of an unknown side in a right-angled triangle<br>○ check if a triangle has a right angle<br>○ calculate the distance between two points in the coordinate plane, yielding the distance formula $d = \sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}$ |
| | • There is a fixed relationship between speed, distance, and time: $\text{speed} = \frac{\text{distance}}{\text{time}}$.<br>• In position-time graphs, the gradient represents speed.<br>***This content is to be taught across Years 9 and 10.*** | • Finding speed, distance, or time, given any two of the measurements |
| | • Decimal measures are used for very small durations (e.g. milliseconds); the rest of time measurement uses a different system, based principally on 12 and 60.<br>***This content is to be taught across Years 9 and 10.*** | • Reasoning about duration using different units of time, including decimal fractions of milliseconds where appropriate<br>***This content is to be taught across Years 9 and 10.*** |

# Geometry

| Year 10 | | |
|---|---|---|
| | **Knowledge**<br>*The facts, concepts, principles, and theories to teach.* | **Practices**<br>*The skills, strategies, and applications to teach.* |
| **Shapes** | • In similar shapes, corresponding angles are equal and the lengths of corresponding sides are proportional.<br>• 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 |
| **Spatial reasoning** | • A set of points in a plane can be transformed by translation, reflection about a line, and rotation about a fixed point.<br>***This content is to be taught across Years 9 and 10.*** | • Representing and constructing 3D shapes, including cylinders, from nets<br>• Transforming 2D shapes, including composite shapes, by resizing them by any scale factor |

# Statistics

| Year 10 | | |
|---|---|---|
| | **Knowledge**<br>*The facts, concepts, principles, and theories to teach.* | **Practices**<br>*The skills, strategies, and applications to teach.* |
| **Developing knowledge from data** | • 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.<br>• 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 | • Planning and collecting multivariate data to respond to a statistical question using a sample or census<br>• Reasoning why a mean or median would be a better measure of central tendency for a given statistical question |

| Year 10 | | |
|---|---|---|
| | **Knowledge**<br>*The facts, concepts, principles, and theories to teach.* | **Practices**<br>*The skills, strategies, and applications to teach.* |
| | sampling, in which each item of the population has an equal probability of being chosen.<br>• 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:<br>○ about 1,000 for categorical variables (with the sample obtained using technology)<br>○ at least 30 for numerical variables. | |
| **Visualisation of data** | • A distribution is formed from all the possible values of a variable and their frequencies. It can be shown using data visualisations that show patterns, trends, and variations and that include dot plots, bar graphs, frequency tables, box plots, histograms, time-series graphs, scatter plots, and two-way tables.<br>• 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.<br>***This content is to be taught across Years 9 and 10.*** | • Creating multiple data visualisations for an investigation<br>• Selecting appropriate scales for data<br>***This content is to be taught across Years 9 and 10.*** |
| | • In relationship investigations:<br>○ 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<br>○ an eyeballed line or curve of best fit can be added for paired numerical data.<br>***This content is to be taught across Years 9 and 10.*** | • 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)<br>***This content is to be taught across Years 9 and 10.*** |
| **Interpretation of data** | • Elements of chance affect the certainty of results from observational studies and experiments.<br>• Uncertainty should be taken into account when making claims.<br>***This content is to be taught across Years 9 and 10.*** | • Critically considering data visualisations, including those from contemporary media, to see if they support or misrepresent the data<br>***This content is to be taught across Years 9 and 10.*** |
| | • 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.<br>• An interpolation involves making predictions within the range of a numerical data variable.<br>• 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<br>• 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<br>• Making informal predictions from scatter plots in relationship situations |

# Probability

| Year 10 | | |
|---|---|---|
| | **Knowledge**<br>*The facts, concepts, principles, and theories to teach.* | **Practices**<br>*The skills, strategies, and applications to teach.* |
| **Experimental and theoretical probability** | • Some chance-based situations, such as tossing a non-regular 3D shape, can only be explored through probability experiments.<br>• Results from sets of repeated trials for the same experiment may vary.<br>• 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.<br>• Lists, tables, two-way tables, and tree diagrams are useful systematic methods for generating all possible outcomes.<br>• In joint events, events can be dependent or independent.<br>• Probabilities for joint events cannot simply be added, because doing so would double-count outcomes that are common to both events.<br>• Mutually exclusive events cannot occur together.<br>• 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).<br>***This content is to be taught across Years 9 and 10.*** | • Carrying out a chance experiment, including running simulations for a large number of trials using digital tools<br>• Systematically listing outcomes for the sample space<br>• 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<br>• 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<br>• Creating and describing data visualisations for the distribution of observed outcomes from a chance experiment<br>• Calculating probability estimates for different outcomes<br>***This content is to be taught across Years 9 and 10.*** |

# The language of Mathematics and Statistics for Year 10

| | **Year 10**<br>*Students will be taught the following new words:* |
|---|---|
| **Number** | • compound interest<br>• principal square root<br>• significant figures |
| **Algebra** | • operator<br>• quadratic equation, relationship<br>• zero product property |
| **Measurement** | • distance formula<br>• resizing<br>• scale factor<br>• surface area |
| **Geometry** | • similarity |
| **Statistics** | • sampling<br>• informal inference<br>• interpolation, extrapolation<br>• 75%-to-50% comparison rule |