MATHEMATICS COURSE PLANNER

VICTORIAN CURRICULUM LEVELS 7–10

OXFORD

	LEVEL 7	LEVEL 8	YEAR 9	YEAR 10

LEVEL DESCRIPTION

LEVEL 7: In Level 7, students work with powers of whole numbers, use index notation, represent numbers as products of powers of prime numbers, and investigate square roots of perfect squares. They use number properties to assist with calculation and order, to add and subtract integers. Students find equivalent fractions, represent positive and negative fractions and mixed numbers on a number line and add, subtract, multiply and divide fractions and decimals with and without the use of technology. They express one quantity as a fraction of another, round to a specified number of decimal places, and convert between fractions, decimals and percentages. They find percentages of quantities and one quantity as a percentage of another. They solve simple ratio problems and calculate best buys with and without the use of technology. Students use variables to express relationships in real life data, and interpret and analyse corresponding graphs. They use pro-numerals to construct simple algebraic expressions and substitute numerical values into these. They solve simple linear equations and plot points on the Cartesian plane. Students use formulas for calculating areas of triangles, rectangles and related shapes, and volumes of cubes and rectangular prisms. They form two-dimensional representations of prisms, buildings and other structures. They use simple combinations of transformations, with and without technology, to create geometric patterns and identify line and point symmetry, apply parallel line and transversal angle properties, angles sums in triangles and quadrilaterals, classify triangles and quadrilaterals, and construct them using compass and straight edge and dynamic geometry technology. Students construct sample spaces for simple experiments involving chance, and assign probabilities to outcomes. They use data from primary and secondary sources to investigate issues of interest, and employ data displays such as dots plots and stem and leaf plots to compare data sets, and calculate measures of centre and simple measures of spread to analyse and interpret the data.

LEVEL 8: In Level 8, students consolidate their proficiency with the four arithmetic operations, and combinations of these, for general computation involving natural numbers, integers and rational numbers, with and without the use of technology. They represent these numbers on the real number line. They extend the use of indices and develop the index laws using number examples. Students investigate the relationship between decimal and fraction representations of rational numbers (terminating and recurring decimals) and work with some irrational real numbers such as square roots and multiples and fractions of π (pi). They solve a range of problems involving ratios, proportions, percentages and rates, with and without the use of digital technologies. Students generalise from number to algebra, and expand, factorise, simplify and substitute into simple algebraic expressions. They plot linear relations on the Cartesian plane, with and without the use of digital technology, solve linear equations and apply linear models. Students convert between units for area and for volume, and solve problems involving duration using 12-hour and 24-hour time, within a given time zone. They develop and use formulas for calculating perimeters and areas of quadrilaterals and circles, and volumes of prisms, and solve related measurement problems. Students use congruence and transformations to establish properties of plane shapes related to sides, angles and symmetry, and solve related problems. Students use the logical connectives 'not', 'and', 'or' and 'either … or' to relate events to probabilities, and use Venn diagrams and two-way tables to calculate probabilities. They develop an understanding that probabilities range from 0 to 1 and that the sum of probabilities for events in a sample space is 1. Students investigate and use various techniques for collecting data, including random sampling. They use digital technology to explore the variability of proportions and means in random samples drawn from a given population, and investigate the effect of individual data values, including outliers, on the measure of centre (average).

YEAR 9: In Year 9, students develop familiarity with a broader range of non-linear and linear functions and relations, and related algebra and graphs. Students apply index laws with integer indices to a range of numerical expressions and extend this to algebraic expressions involving numbers and pro-numerals. Students use indices to express very large and very small numbers in scientific notation, and apply this in measurement contexts. Students solve problems involving direct proportion and rates, and simple interest. They apply coordinate geometry to finding the distance between two points in the Cartesian plane, and the midpoint and gradient of a line segment joining two points. Students graph linear relations and solve linear equations, using tables of values, graphs and algebra. They graph simple non-linear relations such as parabolas, the reciprocal function, and circles at the origin, and solve simple related equations with and without the use of digital technology. Students find areas of composite shapes and the surface area and volumes of right prisms and cylinders. They solve problems involving very small and very large time scales and intervals, and use scientific notation in this context. Students use similarity, enlargement transformations and apply geometric reasoning to solve problems involving ratio and scale factors. They use Pythagoras' Theorem and trigonometry ratios to solve problems in the plane involving right angles triangles, and develop an understanding that these involve irrational real numbers, which are generally represented by rational approximations specified to a given accuracy. Students list outcomes for two-step experiments involving selections with and without replacement, using arrays and tree diagrams, and determine related probabilities. They use Venn diagrams and two-way tables to calculate probabilities and relative frequencies from collected or given data to estimate probabilities. They identify issues and questions involving categorical and numerical data, use back-to-back stem-plots and histograms to describe and compare the distribution of data in terms of location (centre), spread and symmetry or skew.

YEAR 10: In Year 10, students extend their use of mathematical models to a wide range of familiar and unfamiliar contexts, involving the use of all types of real numbers. They recognise the role of logical argument and proof in establishing mathematical propositions. Students apply mental, written or technology-assisted forms of computation as appropriate, and routinely use estimation to validate or provide bounds for their answers. They use exponential functions to model compound interest problems. Students expand, factorise, simplify and substitute into a wide range of algebraic expressions, including linear, quadratic, and exponential terms and relations, as well as simple algebraic fractions with numerical denominators. They solve related equations, linear inequalities and simultaneous linear equations, with and without the use of digital technology. They explore the connection between tabular, graphical and algebraic representations of non-linear relations, including circles with centres at any location in the Cartesian plane. Students solve problems involving surface area and volume for a range of objects, and follow proofs of key geometric results involving the application of congruence and similarity. They solve practical problems in two and three dimensions involving right angles triangles, Pythagoras' Theorem and trigonometry. Students extend their work in probability to combinations of up to three events, using lists, tables, Venn diagrams, tree diagrams and grids as applicable to determine probabilities. They explore the concepts of conditional probability and independence, and their application to solving problems involving chance events. Students use quartiles and the interquartile range as a measure of spread, and construct and interpret boxplots to compare data sets. They relate box plots to corresponding dot plots and histograms. Students explore the association between two numerical variables using scatterplots, in particular with time as the independent variable. They discuss claims made using statistics in various media articles and other reports, on issues of interest.

LEVEL 10A: Level 10A provides optional, additional content for students to be extended in their mathematical studies. Students could extend work in number and algebra to investigate the structure and properties of number systems, with further analysis of order relations and inequalities. They could extend the study of trigonometry to include an introduction to circular functions and equations, or extend the study of indices and exponential functions to logarithms, including an introduction to logarithmic functions. Students could extend work in measurement and geometry to proving a broader range of geometric propositions solving trigonometric problems in non-right angles triangles, or solving three dimensional problems involving surface area and volume of cones and spheres and composite shapes. Students could extend work in statistics and probability to explore the concepts of conditionality, dependence and independence in depth, or consider how various measures of location and spread can be used to describe the distribution of a data set, and investigate how robust these are with respect to variation in the data, in particular with respect to measurement error.

NUMBER & ALGEBRA

NUMBER & PLACE VALUE

LEVEL 7	LEVEL 8	YEAR 9	YEAR 10
• Investigate index notation and represent whole numbers as products of powers of prime numbers (VCMNA238) • Investigate and use square roots of perfect square numbers (VCMNA239) • Apply the associative, commutative and distributive laws to aid mental and written computation and make estimates for these computations (VCMNA240) • Compare, order, add and subtract integers (VCMNA241)	• Use index notation with numbers to establish the index laws with positive integral indices and the zero index (VCMNA272) • Carry out the four operations with rational numbers and integers, using efficient mental and written strategies and appropriate digital technologies and make estimates for these computations (VCMNA273)		

REAL NUMBERS

LEVEL 7	LEVEL 8	YEAR 9	YEAR 10	LEVEL 10A
• Compare fractions using equivalence. Locate and represent positive and negative fractions and mixed numbers on a number line (VCMNA242) • Solve problems involving addition and subtraction of fractions, including those with unrelated denominators (VCMNA243) • Multiply and divide fractions and decimals using efficient written strategies and digital technologies (VCMNA244) • Express one quantity as a fraction of another, with and without the use of digital technologies (VCMNA245) • Round decimals to a specified number of decimal places (VCMNA246) • Connect fractions, decimals and percentages and carry out simple conversions (VCMNA247) • Find percentages of quantities and express one quantity as a percentage of another, with and without digital technologies (VCMNA248) • Recognise and solve problems involving simple ratios (VCMNA249)	• Investigate terminating and recurring decimals (VCMNA274) • Investigate the concept of irrational numbers, including π (VCMNA275) • Solve problems involving the use of percentages, including percentage increases and decreases and percentage error, with and without digital technologies (VCMNA276) • Solve a range of problems involving rates and ratios, including distance-time problems for travel at a constant speed, with and without digital technologies (VCMNA277)	• Solve problems involving direct proportion. Explore the relationship between graphs and equations corresponding to simple rate problems (VCMNA301) • Apply index laws to numerical expressions with integer indices (VCMNA302) • Express numbers in scientific notation (VCMNA303)	• Solve simple problems involving inverse proportion (VCMNA327)	• Define rational and irrational numbers and perform operations with surds and fractional indices (VCMNA355) • Use the definition of a logarithm to establish and apply the laws of logarithms and investigate logarithmic scales in measurement (VCMNA356)

MONEY & FINANCIAL MATHEMATICS

LEVEL 7	LEVEL 8	YEAR 9	YEAR 10
• Investigate and calculate 'best buys', with and without digital technologies (VCMNA250)	• Solve problems involving profit and loss, with and without digital technologies (VCMNA278)	• Solve problems involving simple interest (VCMNA304)	• Connect the compound interest formula to repeated applications of simple interest using appropriate digital technologies (VCMNA328)

PATTERNS & ALGEBRA

LEVEL 7	LEVEL 8	YEAR 9	YEAR 10	LEVEL 10A
• Introduce the concept of variables as a way of representing numbers using letters (VCMNA251) • Create algebraic expressions and evaluate them by substituting a given value for each variable (VCMNA252) • Extend and apply the laws and properties of arithmetic to algebraic terms and expressions general purpose programming language (VCMNA253) • Design and implement mathematical algorithms using a simple general purpose programming language (VCMNA254)	• Extend and apply the distributive law to the expansion of algebraic expressions (VCMNA279) • Factorise algebraic expressions by identifying numerical factors (VCMNA280) • Simplify algebraic expressions involving the four operations (VCMNA281) • Use algorithms and related testing procedures to identify and correct errors (VCMNA282)	• Extend and apply the index laws to variables, using positive integer indices and the zero index (VCMNA305) • Apply the distributive law to the expansion of algebraic expressions, including binomials, and collect like terms where appropriate (VCMNA306) • Apply set structures to solve real-world problems (VCMNA307)	• Factorise algebraic expressions by taking out a common algebraic factor (VCMNA329) • Simplify algebraic products and quotients using index laws (VCMNA330) • Apply the four operations to simple algebraic fractions with numerical denominators (VCMNA331) • Expand binomial products and factorise monic quadratic expressions using a variety of strategies (VCMNA332) • Substitute values into formulas to determine an unknown and re-arrange formulas to solve for a particular term (VCMNA333) • Implement algorithms using data structures in a general-purpose programming language (VCMNA334)	• Investigate the concept of a polynomial and apply the factor and remainder theorems to solve problems (VCMNA357) • Devise and use algorithms and simulations to solve mathematical problems (VCMNA358)

LINEAR & NON-LINEAR RELATIONSHIPS

LEVEL 7	LEVEL 8	YEAR 9	YEAR 10	LEVEL 10A
• Given coordinates, plot points on the Cartesian plane, and find coordinates for a given point (VCMNA255) • Solve simple linear equations (VCMNA256) • Investigate, interpret and analyse graphs from real life data, including consideration of domain and range (VCMNA257)	• Plot linear relationships on the Cartesian plane with and without the use of digital technology (VCMNA283) • Solve linear equations using algebraic and graphical techniques. Verify solutions by substitution (VCMNA284) • Plot graphs of non-linear real life data with and without the use of digital technologies, and interpret and analyse these graphs (VCMNA285)	• Find the distance between two points located on a Cartesian plane using a range of strategies, including graphing software (VCMNA308) • Find the midpoint and gradient of a line segment (interval) on the Cartesian plane using a range of strategies, including graphing software (VCMNA309) • Sketch linear graphs using the coordinates of two points and solve linear equations (VCMNA310) • Graph simple non-linear relations with and without the use of digital technologies and solve simple related equations (VCMNA311)	• Solve problems involving linear equations, including those derived from formulas (VCMNA335) • Solve linear inequalities and graph their solutions on a number line (VCMNA336) • Solve simultaneous linear equations, using algebraic and graphical techniques including using digital technology (VCMNA337) • Solve problems involving gradients of parallel and perpendicular lines (VCMNA338) • Explore the connection between algebraic and graphical representations of relations such as simple quadratic, reciprocal, circle and exponential, using digital technology as appropriate (VCMNA339) • Solve linear equations involving simple algebraic fractions (VCMNA340) • Solve simple quadratic equations using a range of strategies (VCMNA341) • Solve equations using systematic guess-check-and-refine with digital technology (VCMNA342)	• Describe, interpret and sketch parabolas, hyperbolas, circles and exponential functions and their transformations (VCMNA359) • Solve simple exponential equations (VCMNA360) • Apply understanding of polynomials to sketch a range of curves and describe the features of these curves from their equation (VCMNA361) • Factorise monic and non-monic quadratic expressions and solve a wide range of quadratic equations derived from a variety of contexts (VCMNA362) • Use function notation to describe the relationship between dependent and independent variables in modelling contexts (VCMNA363) • Solve simultaneous equations using systematic guess-check-and-refine with digital technology (VCMNA364)

MEASUREMENT & GEOMETRY

USING UNITS OF MEASUREMENT

LEVEL 7	LEVEL 8	YEAR 9	YEAR 10	LEVEL 10A
• Establish the formulas for areas of rectangles, triangles and parallelograms and use these in problem solving (VCMMG258) • Calculate volumes of rectangular prisms (VCMMG259)	• Choose appropriate units of measurement for area and volume and convert from one unit to another (VCMMG286) • Find perimeters and areas of parallelograms, trapeziums, rhombuses and kites (VCMMG287) • Investigate the relationship between features of circles such as circumference, area, radius and diameter. Use formulas to solve problems involving determining radius, diameter, circumference and area from each other (VCMMG288) • Develop the formulas for volumes of rectangular and triangular prisms and prisms in general. Use formulas to solve problems involving volume (VCMMG289) • Solve problems involving duration, including using 12- and 24-hour time within a single time zone (VCMMG290)	• Calculate the areas of composite shapes (VCMMG312) • Calculate the surface area and volume of cylinders and solve related problems (VCMMG313) • Solve problems involving the surface area and volume of right prisms (VCMMG314) • Investigate very small and very large time scales and intervals (VCMMG315)	• Solve problems involving surface area and volume for a range of prisms, cylinders and composite solids (VCMMG343)	• Solve problems involving surface area and volume of right pyramids, right cones, spheres and related composite solids (VCMMG365)

SHAPE

LEVEL 7	LEVEL 8	YEAR 9	YEAR 10
• Draw different views of prisms and solids formed from combinations of prisms (VCMMG260)			

LOCATION & TRANSFORMATION

LEVEL 7	LEVEL 8	YEAR 9	YEAR 10
• Describe translations, reflections in an axis, and rotations of multiples of 90° on the Cartesian plane using coordinates. Identify line and rotational symmetries (VCMMG261)			

GEOMETRIC REASONING

LEVEL 7	LEVEL 8	YEAR 9	YEAR 10	LEVEL 10A
• Classify triangles according to their side and angle properties and describe quadrilaterals (VCMMG262) • Demonstrate that the angle sum of a triangle is 180° and use this to find the angle sum of a quadrilateral (VCMMG263) • Identify corresponding, alternate and co-interior angles when two straight lines are crossed by a transversal (VCMMG264) • Investigate conditions for two lines to be parallel and solve simple numerical problems using reasoning (VCMMG265)	• Define congruence of plane shapes using transformations and use transformations of congruent shapes to produce regular patterns in the plane including tessellations with and without the use of digital technology (VCMMG291) • Develop the conditions for congruence of triangles (VCMMG292) • Establish properties of quadrilaterals using congruent triangles and angle properties, and solve related numerical problems using reasoning (VCMMG293)	• Use the enlargement transformation to explain similarity and develop the conditions for triangles to be similar (VCMMG316) • Solve problems using ratio and scale factors in similar figures (VCMMG317)	• Formulate proofs involving congruent triangles and angle properties (VCMMG344) • Apply logical reasoning, including the use of congruence and similarity, to proofs and numerical exercises involving plane shapes (VCMMG345)	• Prove and apply angle and chord properties of circles (VCMMG366)

PYTHAGORAS & TRIGONOMETRY

LEVEL 7	LEVEL 8	YEAR 9	YEAR 10	LEVEL 10A
		• Investigate Pythagoras' Theorem and its application to solving simple problems involving right angled triangles (VCMMG318) • Use similarity to investigate the constancy of the sine, cosine and tangent ratios for a given angle in right-angled triangles (VCMMG319) • Apply trigonometry to solve right-angled triangle problems (VCMMG320)	• Solve right-angled triangle problems including those involving direction and angles of elevation and depression (VCMMG346) • Apply Pythagoras' Theorem and trigonometry to solving three-dimensional problems in right-angled triangles (VCMMG370)	• Establish the sine, cosine and area rules for any triangle and solve related problems (VCMMG367) • Use the unit circle to define trigonometric functions as functions of a real variable, and graph them with and without the use of digital technologies (VCMMG368) • Solve simple trigonometric equations (VCMMG369) • Apply Pythagoras' Theorem and trigonometry to solving three-dimensional problems in right-angled triangles (VCMMG370)

STATISTICS & PROBABILITY

CHANCE

LEVEL 7	LEVEL 8	YEAR 9	YEAR 10	LEVEL 10A
• Construct sample spaces for single-step experiments with equally likely outcomes (VCMSP266) • Assign probabilities to the outcomes of events and determine probabilities for events (VCMSP267)	• Identify complementary events and use the sum of probabilities to solve problems (VCMSP294) • Describe events using language of 'at least', exclusive 'or' (A or B but not both), inclusive 'or' (A or B or both) and 'and' (VCMSP295) • Represent events in two-way tables and Venn diagrams and solve related problems (VCMSP296)	• List all outcomes for two-step chance experiments, both with and without replacement using tree diagrams or arrays. Assign probabilities to outcomes and determine probabilities for events (VCMSP321) • Calculate relative frequencies from given or collected data to estimate probabilities of events involving 'and' or 'or' (VCMSP322) • Investigate reports of surveys in digital media and elsewhere for information on how data were obtained to estimate population means and medians (VCMSP323)	• Describe the results of two- and three-step chance experiments, both with and without replacements, assign probabilities to outcomes and determine probabilities of events. Investigate the concept of independence (VCMSP347) • Use the language of 'if ....then, 'given', 'of', 'knowing that' to investigate conditional statements and identify common mistakes in interpreting such language (VCMSP348)	• Investigate reports of studies in digital media and elsewhere for information on their planning and implementation (VCMSP371)

DATA REPRESENTATION & INTERPRETATION

LEVEL 7	LEVEL 8	YEAR 9	YEAR 10	LEVEL 10A
• Identify and investigate issues involving numerical data collected from primary and secondary sources (VCMSP268) • Construct and compare a range of data displays including stem-and-leaf plots and dot plots (VCMSP269) • Calculate mean, median, mode and range for sets of data. Interpret these statistics in the context of data (VCMSP270) • Describe and interpret data displays using median, mean and range (VCMSP271)	• Distinguish between a population and a sample and investigate techniques for collecting data, including census, sampling and observation (VCMSP297) • Explore the practicalities and implications of obtaining data through sampling using a variety of investigative processes (VCMSP298) • Explore the variation of means and proportions of random samples drawn from the same population (VCMSP299) • Investigate the effect of individual data values including outliers, on the range, mean and median (VCMSP300)	• Identify everyday questions and issues involving at least one numerical and at least one categorical variable, and collect data directly from secondary sources (VCMSP324) • Construct back-to-back stem-and-leaf plots and histograms and describe data, using terms including 'skewed', 'symmetric' and 'bi modal' (VCMSP325) • Compare data displays using mean, median and range to describe and interpret numerical data sets in terms of location (centre) and spread (VCMSP326)	• Determine quartiles and interquartile range and investigate the effect of individual data values, including outliers on the interquartile range (VCMSP349) • Construct and interpret box plots and use them to compare data sets (VCMSP350) • Compare shapes of box plots to corresponding histograms and dot plots and discuss the distribution of data (VCMSP351) • Use scatter plots to investigate and comment on relationships between two numerical variables (VCMSP352) • Investigate and describe bivariate numerical data, including where the independent variable is time (VCMSP353) • Evaluate statistical reports in the media and other places by linking claims to displays, statistics and representative data (VCMSP354)	• Calculate and interpret the mean and standard deviation of data and use these to compare data sets. Investigate the effect of individual data values including outliers, on the standard deviation (VCMSP372) • Use digital technology to investigate bivariate numerical data sets. Where appropriate use a straight line to describe the relationship allowing for variation, make predictions based on this straight line and discuss limitations (VCMSP373)

ACHIEVEMENT STANDARD

LEVEL 7

Number and Algebra
Students solve problems involving the order, addition and subtraction of integers. They make the connections between whole numbers and index notation and the relationship between perfect squares and square roots. They solve problems involving all four operations with fractions, decimals, percentages and their equivalences, and express fractions in their simplest form. Students compare the cost of items to make financial decisions, with and without the use of digital technology. They make simple estimates to judge the reasonableness of results. Students use variables to represent arbitrary numbers and connect the laws and properties of number to algebra and substitute numbers into algebraic expressions. They assign ordered pairs to given points on the Cartesian plane and interpret and analyse graphs of relations from real data. Students develop simple linear models for situations, make predictions based on these models, solve related equations and check their solutions.

Measurement and Geometry
Students use formulas for the area and perimeter of rectangles. They classify triangles and quadrilaterals and represent transformations of these shapes on the Cartesian plane, with and without the use of digital technology. Students name the types of angles formed by transversals crossing parallel lines and solve simple numerical problems involving these lines and angles. They describe different views of three-dimensional objects, and use models, sketches and digital technology to represent these views. Students calculate volumes of rectangular prisms.

Statistics and Probability
Students identify issues involving the collection of discrete and continuous data from primary and secondary sources. They construct stem-and-leaf plots and dot-plots. Students identify or calculate mean, mode, median and range for data sets, using digital technology for larger data sets. They describe the relationship between the median and mean in data displays. Students determine the sample space for simple experiments with equally likely outcomes, and assign probabilities.

LEVEL 8

Number and Algebra
Students use efficient mental and written strategies to make estimates and carry out the four operations with integers, and apply the index laws to whole numbers. They identify and describe rational and irrational numbers in context. Students estimate answers and solve everyday problems involving profit and loss rates, ratios and percentages, with and without the use of digital technology. They simplify a variety of algebraic expressions and connect expansion and factorisation of linear expressions. Students solve linear equations and graph linear relationships on the Cartesian plane.

Measurement and Geometry
Students convert between units of measurement for area and for volume. They find the perimeter and area of parallelograms, rhombuses and kites. Students name the features of circles, calculate circumference and area, and solve problems relating to the volume of prisms. They make sense of time duration in real applications. They find the perimeter and area of composite shapes, surface area and volume of rectangular conditions for the congruence of triangles and deduce the properties of quadrilaterals. They use tools, including digital technology, to construct congruent shapes.

Statistics and Probability
Students explain issues related to the collection of sample data and discuss the effect of outliers on means and medians of the data. They use various approaches, including the range and measures of centre to summarise and interpret data. Students model situations with Venn diagrams and two-way tables and explain the use of 'not', 'and' and 'or'. Students choose appropriate language to describe events and experiments. They determine complementary events and calculate the sum of probabilities.

YEAR 9

Number and Algebra
Students apply the index laws using integer indices to variables and numbers, express numbers in scientific notation, solve problems involving very small and very large numbers, and check the order of magnitude of calculations. They solve problems involving simple interest. Students use the distributive law to expand algebraic expressions, including binomial expressions, and simplify a range of algebraic expressions. They find the distance between two points on the Cartesian plane and the gradient and midpoint of a line segment using a range of strategies including the use of digital technology. They sketch and draw linear and non-linear relations, solve simple related equations and explain the relationship between the graphical and symbolic forms, with and without the use of digital technology.

Measurement and Geometry
Students solve measurement problems involving perimeter and area of composite shapes, surface area and volume of rectangular prisms and cylinders, with and without the use of digital technology. They relate three-dimensional objects to two-dimensional representations. Students explain similarity of triangles, interpret ratios and scale factors in similar figures, and apply Pythagoras' Theorem and trigonometry to solve problems involving angles and lengths in right-angled triangles.

Statistics and Probability
Students compare techniques for collecting data from primary and secondary sources, and identify questions and issues involving different data types. They construct histograms and back-to-back stem-and-leaf plots with and without the use of digital technology. Students identify mean and median in skewed, symmetric and bi-modal displays, and describe the effect of the shape of the data. They calculate relative frequencies to estimate probabilities. Students list outcomes for two-step experiments and assign probabilities for those outcomes and related events.

YEAR 10

Number and Algebra
Students recognise the connection between simple and compound interest. They solve problems involving linear equations and inequalities, quadratic equations and pairs of simultaneous linear equations and related algebra, with and without the use of digital technology. Students substitute into formulas, find unknown values, manipulate linear algebraic expressions, expand binomial expressions and factorise monic and simple non-monic quadratic expressions, with and without the use of digital technology. They represent linear, quadratic and exponential functions numerically, graphically and algebraically, and use them to model situations and solve practical problems.

Measurement and Geometry
Students solve surface area and volume problems relating to composite solids. They use parallel and perpendicular lines, angle and triangle properties, similarity, trigonometry and congruence to solve practical problems and develop proofs involving lengths, angles and areas in plane shapes. They use digital technology to construct and manipulate geometric shapes and objects, and explore symmetry and pattern in two dimensions.

Statistics and Probability
Students compare univariate data sets by referring to summary statistics and the shape of their displays. They describe bivariate data where the independent variable is time and use scatter-plots generated by digital technology to investigate relationships between two continuous variables. Students evaluate the use of statistics in the media. They list outcomes for multi-step chance experiments involving independent and dependent events, and assign probabilities for these experiments.