COURSE PLANNER

AUSTRALIAN CURRICULUM: MATHS YEARS 7–10

Number and Algebra

Year 7

Number and place value

- Investigate index notation and represent whole numbers as products of powers of prime numbers (ACMNA149)
- Investigate and use square roots of perfect square numbers (ACMNA150)
- Apply the associative, commutative and distributive laws to aid mental and written computation (ACMNA151)
- Compare, order, add and subtract integers (ACMNA280)

Real numbers

- Compare fractions using equivalence. Locate and represent positive and negative fractions and mixed numbers on a number line (ACMNA152)
- Solve problems involving addition and subtraction of fractions, including those with unrelated denominators (ACMNA153)
- Multiply and divide fractions and decimals using efficient written strategies and digital technologies (ACMNA154)
- Express one quantity as a fraction of another, with and without the use of digital technologies (ACMNA155)
- Round decimals to a specified number of decimal places (ACMNA156)
- Connect fractions, decimals and percentages and carry out simple conversions (ACMNA157)
- Find percentages of quantities and express one quantity as a percentage of another, with and without digital technologies (ACMNA158)
- Recognise and solve problems involving simple ratios (ACMNA173)

Money and financial mathematics

- Investigate and calculate 'best buys', with and without digital technologies (ACMNA174)

Patterns and algebra

- Introduce the concept of variables as a way of representing numbers using letters (ACMNA175)
- Create algebraic expressions and evaluate them by substituting a given value for each variable (ACMNA176)
- Extend and apply the laws and properties of arithmetic to algebraic terms and expressions (ACMNA177)

Linear and non-linear relationships

- Given coordinates, plot points on the Cartesian plane, and find coordinates for a given point (ACMNA178)
- Solve simple linear equations (ACMNA179)
- Investigate, interpret and analyse graphs from authentic data (ACMNA180)

Year 8

Number and place value

- Use index notation with numbers to establish the index laws with positive integral indices and the zero index (ACMNA182)
- Carry out the four operations with rational numbers and integers, using efficient mental and written strategies and appropriate digital technologies (ACMNA183)

Real numbers

- Investigate terminating and recurring decimals (ACMNA184)
- Investigate the concept of irrational numbers, including π (ACMNA186)
- Solve problems involving the use of percentages, including percentage increases and decreases, with and without digital technologies (ACMNA187)
- Solve a range of problems involving rates and ratios, with and without digital technologies (ACMNA188)

Money and financial mathematics

- Solve problems involving profit and loss, with and without digital technologies (ACMNA189)

Patterns and algebra

- Extend and apply the distributive law to the expansion of algebraic expressions (ACMNA190)
- Factorise algebraic expressions by identifying numerical factors (ACMNA191)
- Simplify algebraic expressions involving the four operations (ACMNA192)

Linear and non-linear relationships

- Plot linear relationships on the Cartesian plane with and without the use of digital technologies (ACMNA193)
- Solve linear equations using algebraic and graphical techniques. Verify solutions by substitution (ACMNA194)

Year 9

Real numbers

- Solve problems involving direct proportion. Explore the relationship between graphs and equations corresponding to simple rate problems (ACMNA208)
- Apply index laws to numerical expressions with integer indices (ACMNA209)
- Express numbers in scientific notation (ACMNA210)

Money and financial mathematics

- Solve problems involving simple interest (ACMNA211)

Patterns and algebra

- Extend and apply the index laws to variables, using positive integer indices and the zero index (ACMNA212)
- Apply the distributive law to the expansion of algebraic expressions, including binomials, and collect like terms where appropriate (ACMNA213)

Linear and non-linear relationships

- Find the distance between two points located on a Cartesian plane using a range of strategies, including graphing software (ACMNA214)
- Find the midpoint and gradient of a line segment (interval) on the Cartesian plane using a range of strategies, including graphing software (ACMNA294)
- Sketch linear graphs using the coordinates of two points and solve linear equations (ACMNA215)
- Graph simple non-linear relations with and without the use of digital technologies and solve simple related equations (ACMNA296)

Year 10

Real numbers (10A)

- Define rational and irrational numbers and perform operations with surds and fractional indices (ACMNA264) (10A)
- Use the definition of a logarithm to establish and apply the laws of logarithms (ACMNA265) (10A)

Money and financial mathematics

- Connect the compound interest formula to repeated applications of simple interest using appropriate digital technologies (ACMNA229)

Patterns and algebra

- Factorise algebraic expressions by taking out a common algebraic factor (ACMNA230)
- Simplify algebraic products and quotients using index laws (ACMNA231)
- Apply the four operations to simple algebraic fractions with numerical denominators (ACMNA232)
- Expand binomial products and factorise monic quadratic expressions using a variety of strategies (ACMNA233)
- Substitute values into formulas to determine an unknown (ACMNA234)
- Investigate the concept of a polynomial and apply the factor and remainder theorems to solve problems (ACMNA266) (10A)

Linear and non-linear relationships

- Solve problems involving linear equations, including those derived from formulas (ACMNA235)
- Solve linear inequalities and graph their solutions on a number line (ACMNA236)
- Solve linear simultaneous equations, using algebraic and graphical techniques including using digital technology (ACMNA237)
- Solve problems involving parallel and perpendicular lines (ACMNA238)
- Explore the connection between algebraic and graphical representations of relations such as simple quadratics, circles and exponentials using digital technology as appropriate (ACMNA239)
- Solve linear equations involving simple algebraic fractions (ACMNA240)
- Solve simple quadratic equations using a range of strategies (ACMNA241)
- Solve simple exponential equations (ACMNA270) (10A)
- Describe, interpret and sketch parabolas, hyperbolas, circles and exponential functions and their transformations (ACMNA267) (10A)
- Apply understanding of polynomials to sketch a range of curves and describe the features of these curves from their equation (ACMNA268) (10A)
- Factorise monic and non-monic quadratic expressions and solve a wide range of quadratic equations derived from a variety of contexts (ACMNA269) (10A)

Measurement and Geometry

Year 7

Using units of measurement

- Establish the formulas for areas of rectangles, triangles and parallelograms and use these in problem solving (ACMMG159)
- Calculate volumes of rectangular prisms (ACMMG160)

Shape

- Draw different views of prisms and solids formed from combinations of prisms (ACMMG161)

Location and transformation

- Describe translations, reflections in an axis, and rotations of multiples of 90° on the Cartesian plane using coordinates. Identify line and rotational symmetries (ACMMG181)

Geometric reasoning

- Identify corresponding, alternate and co-interior angles when two straight lines are crossed by a transversal (ACMMG163)
- Investigate conditions for two lines to be parallel and solve simple numerical problems using reasoning (ACMMG164)
- Demonstrate that the angle sum of a triangle is 180° and use this to find the angle sum of a quadrilateral (ACMMG166)
- Classify triangles according to their side and angle properties and describe quadrilaterals (ACMMG165)

Year 8

Using units of measurement

- Choose appropriate units of measurement for area and volume and convert from one unit to another (ACMMG195)
- Find perimeters and areas of parallelograms, trapeziums, rhombuses and kites (ACMMG196)
- Investigate the relationship between features of circles such as circumference, area, radius and diameter. Use formulas to solve problems involving circumference and area (ACMMG197)
- Develop the formulas for volumes of rectangular and triangular prisms and prisms in general. Use formulas to solve problems involving volume (ACMMG198)
- Solve problems involving duration, including using 12- and 24-hour time within a single time zone (ACMMG199)

Geometric reasoning

- Define congruence of plane shapes using transformations (ACMMG200)
- Develop the conditions for congruence of triangles (ACMMG201)
- Establish properties of quadrilaterals using congruent triangles and angle properties, and solve related numerical problems using reasoning (ACMMG202)

Year 9

Using units of measurement

- Calculate the areas of composite shapes (ACMMG216)
- Calculate the surface area and volume of cylinders and solve related problems (ACMMG217)
- Solve problems involving the surface area and volume of right prisms (ACMMG218)
- Investigate very small and very large time scales and intervals (ACMMG219)

Geometric reasoning

- Use the enlargement transformation to explain similarity and develop the conditions for triangles to be similar (ACMMG220)
- Solve problems using ratio and scale factors in similar figures (ACMMG221)

Pythagoras and trigonometry

- Investigate Pythagoras' Theorem and its application to solving simple problems involving right-angled triangles (ACMMG222)
- Use similarity to investigate the constancy of the sine, cosine and tangent ratios for a given angle in right-angled triangles (ACMMG223)
- Apply trigonometry to solve right-angled triangle problems (ACMMG224)

Year 10

Using units of measurement

- Solve problems involving surface area and volume for a range of prisms, cylinders and composite solids (ACMMG242)
- Solve problems involving surface area and volume of right pyramids, right cones, spheres and related composite solids (ACMMG271) (10A)

Geometric reasoning

- Formulate proofs involving congruent triangles and angle properties (ACMMG243)
- Apply logical reasoning, including the use of congruence and similarity, to proofs and numerical exercises involving plane shapes (ACMMG244)
- Prove and apply angle and chord properties of circles (ACMMG272) (10A)

Pythagoras and trigonometry

- Solve right-angled triangle problems including those involving direction and angles of elevation and depression (ACMMG245)
- Establish the sine, cosine and area rules for any triangle and solve related problems (ACMMG273) (10A)
- Use the unit circle to define trigonometric functions, and graph them with and without the use of digital technologies (ACMMG274) (10A)
- Solve simple trigonometric equations (ACMMG275) (10A)
- Apply Pythagoras' theorem and trigonometry to solving three-dimensional problems in right-angled triangles (ACMMG276) (10A)

Statistics and Probability

Year 7

Chance

- Construct sample spaces for single-step experiments with equally likely outcomes (ACMSP167)
- Assign probabilities to the outcomes of events and determine probabilities for events (ACMSP168)

Data representation and interpretation

- Identify and investigate issues involving numerical data collected from primary and secondary sources (ACMSP169)
- Construct and compare a range of data displays including stem-and-leaf plots and dot plots (ACMSP170)
- Calculate mean, median, mode and range for sets of data. Interpret these statistics in the context of data (ACMSP171)
- Describe and interpret data displays using median, mean and range (ACMSP172)

Year 8

Chance

- Identify complementary events and use the sum of probabilities to solve problems (ACMSP204)
- Describe events using language of 'at least', exclusive 'or' (A or B but not both), inclusive 'or' (A or B or both) and 'and'. (ACMSP205)
- Represent events in two-way tables and Venn diagrams and solve related problems (ACMSP292)

Data representation and interpretation

- Investigate techniques for collecting data, including census, sampling and observation (ACMSP284)
- Explore the practicalities and implications of obtaining data through sampling using a variety of investigative processes (ACMSP206)
- Explore the variation of means and proportions in random samples drawn from the same population (ACMSP293)
- Investigate the effect of individual data values, including outliers, on the mean and median (ACMSP207)

Year 9

Chance

- 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 (ACMSP225)
- Calculate relative frequencies from given or collected data to estimate probabilities of events involving 'and' or 'or' (ACMSP226)
- Investigate reports of surveys in digital media and elsewhere for information on how data were obtained to estimate population means and medians (ACMSP227)

Data representation and interpretation

- Identify everyday questions and issues involving at least one numerical and at least one categorical variable, and collect data directly from secondary sources (ACMSP228)
- Construct back-to-back stem-and-leaf plots and histograms and describe data, using terms including 'skewed', 'symmetric' and 'bi modal' (ACMSP282)
- Compare data displays using mean, median and range to describe and interpret numerical data sets in terms of location (centre) and spread (ACMSP283)

Year 10

Chance

- 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 (ACMSP246)
- Use the language of 'if ....then, 'given', 'of', 'knowing that' to investigate conditional statements and identify common mistakes in interpreting such language (ACMSP247)
- Investigate reports of studies in digital media and elsewhere for information on the planning and implementation (ACMSP277) (10A)

Data representation and interpretation

- Determine quartiles and interquartile range (ACMSP248)
- Construct and interpret box plots and use them to compare data sets (ACMSP249)
- Compare shapes of box plots to corresponding histograms and dot plots (ACMSP250)
- Use scatter plots to investigate and comment on relationships between two continuous variables (ACMSP251)
- Investigate and describe bivariate numerical data where the independent variable is time (ACMSP252)
- Evaluate statistical reports in the media and other places by linking claims to displays, statistics and representative data (ACMSP253)
- Calculate and interpret the mean and standard deviation of data and use these to compare data sets (ACMSP278) (10A)
- Use information technologies to investigate bivariate numerical data sets. Where appropriate use a straight line to describe the relationship allowing for variation (ACMSP279) (10A)