Planning tool overview 7–10

Coverage of the Australian Curriculum Version 9

This table shows the Australian Curriculum: Mathematics V9.0 content descriptions for each topic and year level from Years 7–10, and also demonstrates when topics start, how they progress and when they finish, at relevant year levels.

Number

Topic	Year 7	Year 8	Year 9	Year 10
Number sequences	Find equivalent representations of rational numbers and represent rational numbers on a number line (AC9M7N04)	Recognise irrational numbers in applied contexts, including square roots and π (AC9M8N01) Recognise terminating and recurring decimals, using digital tools as appropriate (AC9M8N03)	Recognise that the real number system includes the rational numbers and the irrational numbers, and solve problems involving real numbers using digital tools (AC9M9N01)	
Place value	Represent natural numbers in expanded notation using place value and powers of 10 (AC9M7N03)			
Estimation and reasonableness	Round decimals to a given accuracy appropriate to the context and use appropriate rounding and estimation to check the reasonableness of solutions (AC9M7N05)			Recognise the effect of using approximations of real numbers in repeated calculations and compare the results when using exact representations (AC9M10N01)
Addition and subtraction	Compare, order and solve problems involving addition and subtraction of integers (AC9M7N07)			
Factors, multiples, primes	Describe the relationship between perfect square numbers and square roots, and use squares of numbers and square roots of perfect square numbers to solve problems (AC9M7N01) Represent natural numbers as products of powers of prime numbers using exponent notation (AC9M7N02)	Establish and apply the exponent laws with positive integer exponents and the zero-exponent, using exponent notation with numbers (AC9M8N02)		
All operations	Use the 4 operations with positive rational numbers including fractions, decimals and percentages to solve problems using efficient calculation strategies (AC9M7N06)	Use the 4 operations with integers and with rational numbers, choosing and using efficient strategies and digital tools where appropriate (AC9M8N04)		
Proportional reasoning	Recognise, represent and solve problems involving ratios (AC9M7N08)			

Number

Topic	Year 7	Year 8	Year 9	Year 10
Mathematical modelling	Use mathematical modelling to solve practical problems involving rational numbers and percentages, including financial contexts; formulate problems, choosing representations and efficient calculation strategies, using digital tools as appropriate; interpret and communicate solutions in terms of the situation, justifying choices made about the representation (AC9M7N09)	Use mathematical modelling to solve practical problems involving rational numbers and percentages, including financial contexts; formulate problems, choosing efficient calculation strategies and using digital tools where appropriate; interpret and communicate solutions in terms of the situation, reviewing the appropriateness of the model (AC9M8N05)		

Algebra

Topic	Year 7	Year 8	Year 8	Year 10
Patterns and number facts		Experiment with linear functions and relations using digital tools, making and testing conjectures and generalising emerging patterns (AC9M8A04)	Experiment with the effects of the variation of parameters on graphs of related functions, using digital tools, making connections between graphical and algebraic representations, and generalising emerging patterns (AC9M9A06)	Experiment with functions and relations using digital tools, making and testing conjectures and generalising emerging patterns (AC9M10A05)
Use rules and algorithms				
Use variables	Recognise and use variables to represent everyday formulas algebraically and substitute values into formulas to determine an unknown (AC9M7A01)		Apply the exponent laws to numerical expressions with integer exponents and extend to variables (AC9M9A01)	
Formulate and manipulate expressions	Formulate algebraic expressions using constants, variables, operations and brackets (AC9M7A02) Manipulate formulas involving several variables using digital tools, and describe the effect of systematic variation in the values of the variables (AC9M7A06)		Simplify algebraic expressions, expand binomial products and factorise monic quadratic expressions (AC9M9A02)	Expand, factorise and simplify expressions and solve equations algebraically, applying exponent laws involving products, quotients and powers of variables, and the distributive property (AC9M10A01)
Linear expressions	Solve one-variable linear equations with natural number solutions; verify the solution by substitution (AC9M7A03)	Create, expand, factorise, rearrange and simplify linear expressions, applying the associative, commutative, identity, distributive and inverse properties (AC9M8A01)		Solve linear inequalities and simultaneous linear equations in 2 variables; interpret solutions graphically and communicate solutions in terms of the situation (AC9M10A02)
Graphs	Describe relationships between variables represented in graphs of functions from authentic data (AC9M7A04) Generate tables of values from visually growing patterns or the rule of a function; describe and plot these relationships on the Cartesian plane (AC9M7A05)	Graph linear relations on the Cartesian plane using digital tools where appropriate; solve linear equations and one-variable inequalities using graphical and algebraic techniques; verify solutions by substitution (AC9M8A02)	Find the gradient of a line segment, the midpoint of the line interval and the distance between 2 distinct points on the Cartesian plane (AC9M9A03) Identify and graph quadratic functions, solve quadratic equations graphically and numerically, and solve monic quadratic equations with integer roots algebraically, using graphing software and digital tools as appropriate (AC9M9A04)	Recognise the connection between algebraic and graphical representations of exponential relations and solve related exponential equations, using digital tools where appropriate (AC9M10A03)
Mathematical modelling		Use mathematical modelling to solve applied problems involving linear relations, including financial contexts; formulate problems with linear functions, choosing a representation; interpret and communicate solutions in terms of the situation, reviewing the appropriateness of the model (AC9M8A03)	Use mathematical modelling to solve applied problems involving change including financial contexts; formulate problems, choosing to use either linear or quadratic functions; interpret solutions in terms of the situation; evaluate the model and report methods and findings (AC9M9A05)	Use mathematical modelling to solve applied problems involving growth and decay, including financial contexts; formulate problems, choosing to apply linear, quadratic or exponential models; interpret solutions in terms of the situation; evaluate and modify models as necessary and report assumptions, methods and findings (AC9M10A04)

Measurement

Topic	Year 7	Year 8	Year 9	Year 10
Perimeter and area	Solve problems involving the area of triangles and parallelograms using established formulas and appropriate units (AC9M7M01)	Solve problems involving the area and perimeter of irregular and composite shapes using appropriate units (AC9M8M01)		
Volume and surface area	Solve problems involving the volume of right prisms including rectangular and triangular prisms, using established formulas and appropriate units (AC9M7M02)	Solve problems involving the volume and capacity of right prisms using appropriate units (AC9M8M02)	Solve problems involving the volume and surface area of right prisms and cylinders using appropriate units (AC9M9M01)	Solve problems involving the surface area and volume of composite objects using appropriate units (AC9M10M01)
Time and duration		Solve problems involving duration, including using 12- and 24-hour time across multiple time zones (AC9M8M04)	Solve problems involving very small and very large measurements, time scales and intervals expressed in scientific notation (AC9M9M02)	
Angles and parallel lines	Identify corresponding, alternate and co interior relationships between angles formed when parallel lines are crossed by a transversal; use them to solve problems and explain reasons (AC9M7M04) Demonstrate that the interior angle sum of a triangle in the plane is 180° and apply this to determine the interior angle sum of other shapes and the size of unknown angles (AC9M7M05)			
Circles and cylinders	Describe the relationship between π and the features of circles including the circumference, radius and diameter (AC9M7M03)	Solve problems involving the circumference and area of a circle using formulas and appropriate units (AC9M8M03)		
Pythagoras and trigonometry		Use Pythagoras' theorem to solve problems involving the side lengths of right-angled triangles (AC9M8M06)	Solve spatial problems, applying angle properties, scale, similarity, Pythagoras' theorem and trigonometry in right-angled triangles (AC9M9M03)	Solve practical problems applying Pythagoras' theorem and trigonometry of right-angled triangles, including problems involving direction and angles of elevation and depression (AC9M10M03)
Rates and ratios		Recognise and use rates to solve problems involving the comparison of 2 related quantities of different units of measure (AC9M8M005)		
Mathematical modelling	Use mathematical modelling to solve practical problems involving ratios; formulate problems, interpret and communicate solutions in terms of the situation, justifying choices made about the representation (AC9M7M06)	Use mathematical modelling to solve practical problems involving ratios and rates, including financial contexts; formulate problems; interpret and communicate solutions in terms of the situation, reviewing the appropriateness of the model (AC9M8M07)	Use mathematical modelling to solve practical problems involving direct proportion, rates, ratio and scale, including financial contexts; formulate the problems and interpret solutions in terms of the situation; evaluate the model and report methods and findings (AC9M9M05)	Use mathematical modelling to solve practical problems involving proportion and scaling of objects; formulate problems and interpret solutions in terms of the situation; evaluate and modify models as necessary, and report assumptions, methods and findings (AC9M10M05)

Measurement

Topic	Year 7	Year 8	Year 9	Year 10
Measurement of error			Calculate and interpret absolute, relative and percentage errors in measurements, recognising that all measurements are estimates (AC9M9M04)	Identify the impact of measurement errors on the accuracy of results in practical contexts (AC9M10M04)
Logarithmic scale				Interpret and use logarithmic scales in applied contexts involving small and large quantities and change (AC9M10M02)

Space

Topic	Year 7	Year 8	Year 9	Year 10
Shapes and objects	Classify triangles, quadrilaterals and other polygons according to their side and angle properties; identify and reason about relationships (AC9M7SP02)	Identify the conditions for congruence and similarity of triangles and explain the conditions for other sets of common shapes to be congruent or similar, including those formed by transformations (AC9M8SP01) Establish properties of quadrilaterals using congruent triangles and angle properties, and solve related problems explaining reasoning (AC9M8SP02)		
Pythagoras and trigonometry			Recognise the constancy of the sine, cosine and tangent ratios for a given angle in right-angled triangles using properties of similarity (AC9M9SP01)	
Position and location	Represent objects in 2 dimensions; discuss and reason about the advantages and disadvantages of different representations (AC9M7SP01)	Describe the position and location of objects in 3 dimensions in different ways, including using a three dimensional coordinate system with the use of dynamic geometric software and other digital tools (AC9M8SP03)		
Transformations	Describe transformations of a set of points using coordinates in the Cartesian plane, translations and reflections on an axis, and rotations about a given point (AC9M7SP03)		Apply the enlargement transformation to shapes and objects using dynamic geometry software as appropriate; identify and explain aspects that remain the same and those that change (AC9M9SP02)	
Algorithms	Design and create algorithms involving a sequence of steps and decisions that will sort and classify sets of shapes according to their attributes, and describe how the algorithms work (AC9M7SP04)	Design, create and test algorithms involving a sequence of steps and decisions that identify congruency or similarity of shapes, and describe how the algorithm works (AC9M8SP04)	Design, test and refine algorithms involving a sequence of steps and decisions based on geometric constructions and theorems; discuss and evaluate refinements (AC9M9SP03)	Design, test and refine solutions to spatial problems using algorithms and digital tools; communicate and justify solutions (AC9M10SP03)
Proof				Apply deductive reasoning to proofs involving shapes in the plane and use theorems to solve spatial problems (AC9M10SP01)
Networks				Interpret networks and network diagrams used to represent relationships in practical situations and describe connectedness (AC9M10SP02)

Statistics

Topic	Year 7	Year 8	Year 9	Year 10
Collect, sort and compare data		Investigate techniques for data collection including census, sampling, experiment and observation, and explain the practicalities and implications of obtaining data through these techniques (AC9M8ST01)	Analyse how different sampling methods can affect the results of surveys and how choice of representation can be used to support a particular point of view (AC9M9ST02)	
Aquire and record data	Acquire data sets for discrete and continuous numerical variables and calculate the range, median, mean and mode; make and justify decisions about which measures of central tendency provide useful insights into the nature of the distribution of data (AC9M7ST01)			
Represent collected data	Create different types of numerical data displays including stem-and-leaf plots using software where appropriate; describe and compare the distribution of data, commenting on the shape, centre and spread including outliers and determining the range, median, mean and mode (AC9M7ST02)		Choose appropriate forms of display or visualisation for a given type of data; justify selections and interpret displays for a given context (AC9M9ST04)	
Conduct statistical investigations	Plan and conduct statistical investigations involving data for discrete and continuous numerical variables; analyse and interpret distributions of data and report findings in terms of shape and summary statistics (AC9M7ST03)	Plan and conduct statistical investigations involving samples of a population; use ethical and fair methods to make inferences about the population and report findings, acknowledging uncertainty (AC9M8ST04)	Plan and conduct statistical investigations involving the collection and analysis of different kinds of data; report findings and discuss the strength of evidence to support any conclusions (AC9M9ST05)	Plan and conduct statistical investigations of situations that involve bivariate data; evaluate and report findings with consideration of limitations of any inferences (AC9M10ST05)
Interpret and discuss data displays		Analyse and report on the distribution of data from primary and secondary sources using random and non-random sampling techniques to select and study samples (AC9M8ST02)	Analyse reports of surveys in digital media and elsewhere for information on how data was obtained to estimate population means and medians (AC9M9ST01)	Analyse claims, inferences and conclusions of statistical reports in the media, including ethical considerations and identification of potential sources of bias (AC9M10ST01)
Statistical analysis		Compare variations in distributions and proportions obtained from random samples of the same size drawn from a population and recognise the effect of sample size on this variation (AC9M8ST03)	Represent the distribution of multiple data sets for numerical variables using comparative representations; compare data distributions with consideration of centre, spread and shape, and the effect of outliers on these measures (AC9M9ST03)	Compare data distributions for continuous numerical variables using appropriate data displays including boxplots; discuss the shapes of these distributions in terms of centre, spread, shape and outliers in the context of the data (AC9M10ST02) Construct scatterplots and comment on the association between the 2 numerical variables in terms of strength, direction and linearity (AC9M10ST03) Construct two-way tables and discuss possible relationship between categorical variables (AC9M10ST04)

Probability

Topic	Year 7	Year 8	Year 9	Year 10
Possible outcomes	Identify the sample space for single-stage events; assign probabilities to the outcomes of these events and predict relative frequencies for related events (AC9M7P01)	Recognise that complementary events have a combined probability of one; use this relationship to calculate probabilities in applied contexts (AC9M8P01)	List all outcomes for compound events both with and without replacement, using lists, tree diagrams, tables or arrays; assign probabilities to outcomes (AC9M9P01)	
Probability calculations		Determine all possible combinations for 2 events, using two-way tables, tree diagrams and Venn diagrams, and use these to determine probabilities of specific outcomes in practical situations (AC9M8P02)	Calculate relative frequencies from given or collected data to estimate probabilities of events involving "and", inclusive "or" and exclusive "or" (AC9M9P02)	Use the language of "if … then", "given", "of", "knowing that" to describe and interpret situations involving conditional probability (AC9M10P01)
Conduct chance experiments	Conduct repeated chance experiments and run simulations with a large number of trials using digital tools; compare predictions about outcomes with observed results, explaining the differences (AC9M7P02)	Conduct repeated chance experiments and simulations, using digital tools to determine probabilities for compound events, and describe results (AC9M8P03)	Design and conduct repeated chance experiments and simulations, using digital tools to compare probabilities of simple events to related compound events, and describe results (AC9M9P03)	Design and conduct repeated chance experiments and simulations using digital tools to model conditional probability and interpret results (AC9M10P02)

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