

Years 7–10 Mathematics

Australian Curriculum Version 9.0: Sequence of content descriptions

The following table provides a sequence of content descriptions aligned to the strands and sub-strands for Years 7–10 Mathematics. Content descriptions identify the learning area’s essential knowledge, understanding and skills. This resource can be to support curriculum planning. A similar resource is available for Prep–Year 6 Mathematics.

Strand: Number			
Year 7	Year 8	Year 9	Year 10
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	recognise irrational numbers in applied contexts, including square roots and π AC9M8N01	recognise that the real number system includes the rational numbers and the irrational numbers, and solve problems involving real numbers using digital tools AC9M9N01	recognise the effect of using approximations of real numbers in repeated calculations and compare the results when using exact representations AC9M10N01
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		
represent natural numbers in expanded notation using place value and powers of 10 AC9M7N03	recognise terminating and recurring decimals, using digital tools as appropriate AC9M8N03		
find equivalent representations of rational numbers and represent rational numbers on a number line AC9M7N04	use the 4 operations with integers and with rational numbers, choosing and using efficient strategies and digital tools where appropriate AC9M8N04		
round decimals to a given accuracy appropriate to the context and use appropriate rounding and estimation to check the reasonableness of solutions AC9M7N05	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		
use the 4 operations with positive rational numbers including fractions, decimals and percentages to solve problems using efficient calculation strategies AC9M7N06			
compare, order and solve problems involving addition and subtraction of integers AC9M7N07			
recognise, represent and solve problems involving ratios AC9M7N08			
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			

Strand: Algebra			
Year 7	Year 8	Year 9	Year 10
recognise and use variables to represent everyday formulas algebraically and substitute values into formulas to determine an unknown AC9M7A01	create, expand, factorise, rearrange and simplify linear expressions, applying the associative, commutative, identity, distributive and inverse properties AC9M8A01	apply the exponent laws to numerical expressions with integer exponents and extend to variables AC9M9A01	expand, factorise and simplify expressions and solve equations algebraically, applying exponent laws involving products, quotients and powers of variables, and the distributive property AC9M10A01
formulate algebraic expressions using constants, variables, operations and brackets AC9M7A02	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	simplify algebraic expressions, expand binomial products and factorise monic quadratic expressions AC9M9A02	solve linear inequalities and simultaneous linear equations in 2 variables; interpret solutions graphically and communicate solutions in terms of the situation AC9M10A02
solve one-variable linear equations with natural number solutions; verify the solution by substitution AC9M7A03	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	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	recognise the connection between algebraic and graphical representations of exponential relations and solve related exponential equations, using digital tools where appropriate AC9M10A03
describe relationships between variables represented in graphs of functions from authentic data AC9M7A04	experiment with linear functions and relations using digital tools, making and testing conjectures and generalising emerging patterns AC9M8A04	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	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
generate tables of values from visually growing patterns or the rule of a function; describe and plot these relationships on the Cartesian plane AC9M7A05		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	experiment with functions and relations using digital tools, making and testing conjectures and generalising emerging patterns AC9M10A05
manipulate formulas involving several variables using digital tools, and describe the effect of systematic variation in the values of the variables AC9M7A06		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	

Strand: Measurement			
Year 7	Year 8	Year 9	Year 10
<p>solve problems involving the area of triangles and parallelograms using established formulas and appropriate units</p> <p>AC9M7M01</p>	<p>solve problems involving the area and perimeter of irregular and composite shapes using appropriate units</p> <p>AC9M8M01</p>	<p>solve problems involving the volume and surface area of right prisms and cylinders using appropriate units</p> <p>AC9M9M01</p>	<p>solve problems involving the surface area and volume of composite objects using appropriate units</p> <p>AC9M10M01</p>
<p>solve problems involving the volume of right prisms including rectangular and triangular prisms, using established formulas and appropriate units</p> <p>AC9M7M02</p>	<p>solve problems involving the volume and capacity of right prisms using appropriate units</p> <p>AC9M8M02</p>	<p>solve problems involving very small and very large measurements, time scales and intervals expressed in scientific notation</p> <p>AC9M9M02</p>	<p>interpret and use logarithmic scales in applied contexts involving small and large quantities and change</p> <p>AC9M10M02</p>
<p>describe the relationship between π and the features of circles including the circumference, radius and diameter</p> <p>AC9M7M03</p>	<p>solve problems involving the circumference and area of a circle using formulas and appropriate units</p> <p>AC9M8M03</p>	<p>solve spatial problems, applying angle properties, scale, similarity, Pythagoras' theorem and trigonometry in right-angled triangles</p> <p>AC9M9M03</p>	<p>solve practical problems applying Pythagoras' theorem and trigonometry of right-angled triangles, including problems involving direction and angles of elevation and depression</p> <p>AC9M10M03</p>
<p>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</p> <p>AC9M7M04</p>	<p>solve problems involving duration, including using 12- and 24-hour time across multiple time zones</p> <p>AC9M8M04</p>	<p>calculate and interpret absolute, relative and percentage errors in measurements, recognising that all measurements are estimates</p> <p>AC9M9M04</p>	<p>identify the impact of measurement errors on the accuracy of results in practical contexts</p> <p>AC9M10M04</p>
<p>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</p> <p>AC9M7M05</p>	<p>recognise and use rates to solve problems involving the comparison of 2 related quantities of different units of measure</p> <p>AC9M8M05</p>	<p>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</p> <p>AC9M9M05</p>	<p>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</p> <p>AC9M10M05</p>
<p>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</p> <p>AC9M7M06</p>	<p>use Pythagoras' theorem to solve problems involving the side lengths of right-angled triangles</p> <p>AC9M8M06</p>		
	<p>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</p> <p>AC9M8M07</p>		

Strand: Space			
Year 7	Year 8	Year 9	Year 10
represent objects in 2 dimensions; discuss and reason about the advantages and disadvantages of different representations AC9M7SP01	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	recognise the constancy of the sine, cosine and tangent ratios for a given angle in right-angled triangles using properties of similarity AC9M9SP01	apply deductive reasoning to proofs involving shapes in the plane and use theorems to solve spatial problems AC9M10SP01
classify triangles, quadrilaterals and other polygons according to their side and angle properties; identify and reason about relationships AC9M7SP02	establish properties of quadrilaterals using congruent triangles and angle properties, and solve related problems explaining reasoning AC9M8SP02	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	interpret networks and network diagrams used to represent relationships in practical situations and describe connectedness AC9M10SP02
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	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	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
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		

Strand: Statistics			
Year 7	Year 8	Year 9	Year 10
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	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 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
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	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 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	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
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	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	construct scatterplots and comment on the association between the 2 numerical variables in terms of strength, direction and linearity AC9M10ST03
	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	choose appropriate forms of display or visualisation for a given type of data; justify selections and interpret displays for a given context AC9M9ST04	construct two way tables and discuss possible relationship between categorical variables AC9M10ST04
		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

Strand: Probability			
Year 7	Year 8	Year 9	Year 10
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	use the language of 'if then', 'given', 'of', 'knowing that' to describe and interpret situations involving conditional probability AC9M10P01
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	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	design and conduct repeated chance experiments and simulations using digital tools to model conditional probability and interpret results AC9M10P02
	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	

More information

If you would like more information, please visit the QCAA website www.qcaa.qld.edu.au. Alternatively, email the K–10 Curriculum and Assessment branch at australiancurriculum@qcaa.qld.edu.au.

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