Australian CURRICULUM Review

MATHEMATICS

CONSULTATION CURRICULUM

Comparative information 7–10

AUSTRALIAN CURRICULUM, ASSESSMENT AND REPORTING AUTHORITY

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COMPARISON OF CURRENT AND REVISED CURRICULUM IN MATHEMATICS

Content descriptions Year 7 to Year 10

Strand				
Original	***Number and Algebra***			
Proposed	***Number***			
Sub-strand (original): Number and place value	**Year 7** *Students learn to:*	**Year 8** *Students learn to:*	**Year 9** *Students learn to:*	**Year 10** *Students learn to:*
Original	Investigate index notation and represent whole numbers as products of powers of prime numbers (ACMNA149)	Use index notation with numbers to establish the index laws with positive integral indices and the zero index (ACMNA182)		
Proposed	investigate exponent notation and represent natural numbers as products of powers of prime numbers (AC9M7N02)	use exponent notation with numbers to establish the exponent laws with positive integral exponents and the zero exponent (AC9M8N02)		
Original	Investigate and use square roots of perfect square numbers (ACMNA150)	Carry out the four operations with rational numbers and integers, using efficient mental and written strategies and appropriate digital technologies (ACMNA183)		

Proposed	investigate and use square roots of perfect square numbers (AC9M7N01)	use the four operations with integers and rational numbers to model and solve problems (including financial contexts), using efficient mental and written strategies and appropriate digital tools (AC9M8N04)		
Original	Apply the associative, commutative and distributive laws to aid mental and written computation (ACMNA151)			
Proposed	*Removed see (AC9M7A02)*			
Original	Compare, order, add and subtract integers (ACMNA280)			
Proposed	compare, order, add and subtract integers. Model and solve problems (including financial contexts) involving addition and subtraction of integers (AC9M7N07)			

Strand				
Original	***Number and Algebra***			
Proposed	***Number*** ***Measurement*** ***Algebra***			
Sub-strand (original): Real numbers	**Year 7** *Students learn to:*	**Year 8** *Students learn to:*	**Year 9** *Students learn to:*	**Year 10** *Students learn to:*
Original	Compare fractions using equivalence. Locate and represent positive and negative fractions and mixed numbers on a number line (ACMNA152)			
Proposed	determine equivalent fraction, decimal and percentage representations of rational numbers. Locate and represent positive and negative fractions, decimals and mixed numbers on a number line (AC9M7N05)		recognise that the real number system includes all rational and irrational numbers and use real numbers to solve problems using digital tools as appropriate (AC9M9N01)	recognise through experimentation and the use of technology, the effect of using approximations of real numbers in repeated calculations and compare the results when using exact representations (AC9M10N01)
Original	Solve problems involving addition and subtraction of fractions, including those			

	with unrelated denominators (ACMNA153)			
Proposed	carry out the four operations with fractions and decimals and solve problems involving rational numbers and percentages, choosing representations that are suited to the context and enable efficient computational strategies (AC9M7N06)	See (AC9M8N04)		
Original	Multiply and divide fractions and decimals using efficient written strategies and digital technologies (ACMNA154)			
Proposed	See above (AC9M7N06)			
Original	Express one quantity as a fraction of another, with and without the use of digital technologies (ACMNA155)			
Proposed	model situations (including financial contexts) and solve problems using rational numbers and percentages and digital tools as appropriate. Interpret results in terms of			

	the situation (AC9M7N08)			
Original	Round decimals to a specified number of decimal places (ACMNA156)			
Proposed	round decimals correct to a given accuracy with respect to the context and the purpose of the calculation. Use appropriate rounding and estimation to make decisions about the reasonableness of solutions (AC9M7N04)			
Original	Connect fractions, decimals and percentages and carry out simple conversions (ACMNA157)	Investigate terminating and recurring decimals (ACMNA184)	Apply index laws to numerical expressions with integer indices (ACMNA209)	
Proposed	See (AC9M7N05)	recognise and investigate terminating and recurring decimals (AC9M8N03)	apply the exponent laws to numerical expressions with integer exponents and extend to variables, using positive integer exponents (AC9M9A01)	
Original	Find percentages of quantities and express one quantity as a percentage of another, with and without digital technologies. (ACMNA158)	Solve problems involving the use of percentages, including percentage increases and decreases, with and without digital technologies (ACMNA187)	Express numbers in scientific notation (ACMNA210)	

Proposed	See above (AC9M7N08)	model situations (including financial contexts) and solve problems using percentage increases and decreases, using digital tools as appropriate. Interpret the results in terms of the situation (AC9M8N05)	express number in scientific notation and solve problems involving very small and very large measurements, time scales and intervals using scientific notation and appropriate units (AC9M9M03)	
Original	Recognise and solve problems involving simple ratios (ACMNA173)	Solve a range of problems involving rates and ratios, with and without digital technologies (ACMNA188)		
Proposed	explore the use of ratios to compare quantities. Model situations (including investigating 'best buys') using ratios and solve practical problems, interpreting results in terms of the situation (AC9M7M04)	model situations and solve problems using ratios including ratios with more than two terms and ratios involving rational numbers maintaining the proportional relationships in the context of the problem, using digital tools as appropriate, and interpret the results in terms of the situation (AC9M8M04)		
Original		Investigate the concept of irrational numbers, including π (ACMNA186)		
Proposed	use place value and powers of 10 to represent natural numbers in	recognise and investigate irrational numbers in applied contexts including		

	expanded notation (AC9M7N03)	certain square roots and π (AC9M8N01)		
Sub-strand (original): Money and financial mathematics	**Year 7** *Students learn to:*	**Year 8** *Students learn to:*	**Year 9** *Students learn to:*	**Year 10** *Students learn to:*
Original	Investigate and calculate 'best buys', with and without digital technologies (ACMNA174)	Solve problems involving profit and loss, with and without digital technologies (ACMNA189)	Solve problems involving simple interest (ACMNA211)	Connect the compound interest formula to repeated applications of simple interest using appropriate digital technologies (ACMNA229)
Proposed	*Moved to Number (AC9M7N08) and (AC9M7M04)*	*Moved to Number (AC9M8N04) and (AC9M8N05)*	*Moved to Measurement elaboration (AC9M8M05)*	*Moved to Algebra (AC9M10A01)*

Strand				
Original	***Number and Algebra***			
Proposed	***Algebra***			
Sub-strand (original): Patterns and algebra	**Year 7** *Students learn to:*	**Year 8** *Students learn to:*	**Year 9** *Students learn to:*	**Year 10** *Students learn to:*
Original	Introduce the concept of variables as a way of representing numbers using letters (ACMNA175)	Extend and apply the distributive law to the expansion of algebraic expressions (ACMNA190)	Extend and apply the index laws to variables, using positive integer indices and the zero index (ACMNA212)	Factorise algebraic expressions by taking out a common algebraic factor (ACMNA230)
Proposed	explore the use of variables in everyday formulas and	extend and apply the associative, commutative,	See above (AC9M9A01)	expand and factorise expressions and apply exponent laws involving

	substitute values into formulas to determine an unknown, in practical contexts (AC9M7A01)	identity, distributive and inverse properties to create, expand, factorise, rearrange and simplify linear expressions. Use the simplified expressions to solve for given variables (AC9M8A01)		products, quotients and powers of variables. Apply to solve equations algebraically (AC9M10A02)
Original	Create algebraic expressions and evaluate them by substituting a given value for each variable (ACMNA176)	Factorise algebraic expressions by identifying numerical factors (ACMNA191)	Apply the distributive law to the expansion of algebraic expressions, including binomials, and collect like terms where appropriate (ACMNA213)	Simplify algebraic products and quotients using index laws (ACMNA231)
Proposed	create algebraic expressions using constants, variables, operations and brackets. Interpret and factorise these expressions, applying the associative, commutative, identity and distributive laws as applicable (AC9M7A02)	See above (AC9M8A01)	expand and factorise algebraic expressions including simple quadratic expressions (AC9M9A02)	See above (AC9M10A03)
Original	Extend and apply the laws and properties of arithmetic to algebraic terms and expressions (ACMNA177)	Simplify algebraic expressions involving the four operations (ACMNA192)		Apply the four operations to simple algebraic fractions with numerical denominators (ACMNA232)
Proposed	See above (AC9M7A02)	See above (AC9M8A01)		*Removed*
Original				Expand binomial products and factorise monic quadratic

				expressions using a variety of strategies (ACMNA233)
Proposed				See above (AC9M10A03)
Original				Substitute values into formulas to determine an unknown (ACMNA234)
Proposed				use formulas involving exponents and real numbers to model practical problems (including financial contexts) involving growth and decay and solve using digital tools as appropriate (AC9M10A01)

Sub-strand (original): Linear and non-linear relationships	**Year 7** *Students learn to:*	**Year 8** *Students learn to:*	**Year 9** *Students learn to:*	**Year 10** *Students learn to:*
Original	Given coordinates, plot points on the Cartesian plane, and find coordinates for a given point (ACMNA178)	Plot linear relationships on the Cartesian plane with and without the use of digital technologies (ACMNA193)	Find the distance between two points located on the Cartesian plane using a range of strategies, including graphing software (ACMNA214)	Solve problems involving linear equations, including those derived from formulas (ACMNA235)
Proposed	*Removed*	graph linear relations on the Cartesian plane and solve linear equations and one-variable inequalities using algebraic and graphical techniques including the use of	determine the gradient of a line segment passing through two given points on the Cartesian plane and the distance and midpoint between these points using a range of strategies, including graphing software and	See above (AC9M10A01)

		graphing software. Verify solutions by substitution (AC9M8A02)	apply to spatial problems (AC9M9A03)	
Original	Solve simple linear equations (ACMNA179)	Solve linear equations using algebraic and graphical techniques. Verify solutions by substitution (ACMNA194)	Find the midpoint and gradient of a line segment (interval) on the Cartesian plane using a range of strategies, including graphing software (ACMNA294)	Solve linear inequalities and graph their solutions on a number line (ACMNA236)
Proposed	*Removed*	use linear functions to model and interpret situations. Represent these using tables, graphs on the Cartesian plane and algebra to interpolate, extrapolate and solve equations. Interpret solutions in the modelling context (AC9M8A03)	See above (AC9M9A03)	use linear inequalities to model situations, representing them graphically and interpret in the context of the situation. Verify solutions to other inequalities by substitution (AC9M10A04)
Original	Investigate, interpret and analyse graphs from authentic data (ACMNA180)		Sketch linear graphs using the coordinates of two points and solve linear equations (ACMNA215)	Solve linear simultaneous equations, using algebraic and graphical techniques, including using digital technology (ACMNA237)
Proposed	interpret, discuss and analyse relationships represented in graphs from authentic data (AC9M7A03)		See above (AC9M9A03)	model situations (including financial contexts) with simultaneous equations in two variables. Solve pairs of these equations and interpret solutions graphically in the modelling context (AC9M10A06)
Original			Graph simple non-linear relations	Solve problems involving parallel

			with and without the use of digital technologies and solve simple related equations (ACMNA296)	and perpendicular lines (ACMNA238)
Proposed	generate a table of values using the rule of a simple function. Develop tables to represent and describe relationships and plot these relationships on the Cartesian plane (AC9M7A04)		graph simple non-linear relations using graphing software where appropriate and solve linear and quadratic equations involving a single variable graphically, numerically and algebraically using inverse operations and digital tools as appropriate (AC9M9A04)	solve problems involving parallel and perpendicular lines obtained from the graphs of linear functions (AC9M10A03)
Original				Explore the connection between algebraic and graphical representations of relations such as simple quadratics, circles and exponentials using digital technology as appropriate (ACMNA239)
Proposed				recognise the connection between algebraic and graphical representations of exponential relations and solve simple related exponential equations using digital tools as appropriate (AC9M10A05)
Original				Solve linear equations involving simple algebraic fractions (ACMNA240)
Proposed				*Removed*
Original				Solve simple quadratic equations

				using a range of strategies (ACMNA241)
Proposed				*Removed*
Original				
Proposed			use linear and simple quadratic functions to model a variety of different situations involving change and represent these using tables, graphs on the Cartesian plane and algebra. Interpolate, extrapolate and solve equations, interpreting solutions in the modelling context (AC9M9A05)	
Original				
Proposed	apply computational thinking and digital tools to construct tables of values from formulas involving several variables, and systematically explore the effect of variation in one variable while assigning fixed values for other variables (AC9M7A05)	apply computational thinking and reasoning to make and evaluate conjectures that generalise patterns involving rational numbers, using algorithms and digital tools (AC9M8A04)	apply computational thinking to investigate the effects of the variation of parameters on families of graphs of functions and relations using digital tools. Generalise emerging patterns and apply models to situations or problems (AC9M9A06)	apply computational thinking to model and solve algebraic problems graphically or numerically (AC9M10A07)

Strand				
Original	***Measurement and Geometry***			
Proposed	***Measurement***			
Sub-strand (original): Using units of measurement	**Year 7** *Students learn to:*	**Year 8** *Students learn to:*	**Year 9** *Students learn to:*	**Year 10** *Students learn to:*
Original	Establish the formulas for areas of rectangles, triangles and parallelograms, and use these in problem-solving (ACMMG159)	Choose appropriate units of measurement for area and volume and convert from one unit to another (ACMMG195)	Calculate areas of composite shapes (ACMMG216)	
Proposed	establish the formulas for areas of triangles and parallelograms, using their relationship to rectangles and use these to solve practical problems using appropriate units (AC9M7M01)	choose and justify the appropriate metric units for solving problems involving perimeter, area, volume and capacity. Solve practical problems involving the volume and capacity of prisms and converting from one metric unit to another (AC9M8M02)	*Removed*	
Original	Calculate volumes of rectangular prisms (ACMMG160)	Find perimeters and areas of parallelograms, trapeziums, rhombuses and kites (ACMMG196)	Calculate the surface area and volume of cylinders and solve related problems (ACMMG217)	Solve problems involving surface area and volume for a range of prisms, cylinders and composite solids (ACMMG242)

Proposed	establish the formula for the volume of a prism. Use formulas and appropriate units to solve problems involving the volume of prisms including rectangular and triangular prisms (AC9M7M02)	solve problems involving the area and perimeter of composite shapes including the combinations of regular and irregular shapes in practical contexts using appropriate units (AC9M8M01)	solve problems involving the volume of right prisms and cylinders in practical contexts and explore their relationship to right pyramids and cones (AC9M9M01)	solve problems involving the surface area and volume of composite objects including estimating the volume of irregular objects in practical contexts (AC9M10M01)
Original		Investigate the relationship between features of circles such as circumference, area, radius and diameter. Use formulas to solve problems involving circumference and area (ACMMG197)	Solve problems involving the surface area and volume of right prisms (ACMMG218)	
Proposed	investigate the relationship between the ratio π and features of circles such as the circumference, radius and diameter (AC9M7M03)	establish the formula for the area of a circle and use formulas to solve problems involving circumference and area of a circle (AC9M8M03)	solve problems involving the surface area of right prisms and cylinders (AC9M9M02)	
Original		Develop formulas for volumes of rectangular and triangular prisms and prisms in general. Use formulas to solve problems involving volume (ACMMG198)		
Proposed		*Removed*		
Original		Solve problems involving duration, including using 12- and 24-hour time within a single time zone	Investigate very small and very large time scales and intervals (ACMMG219)	

		(ACMMG199)		
Proposed		solve problems involving duration, including using 12-hour and 24-hour time across multiple time zones (AC9M8M06)	See above (AC9M9M03)	interpret and use logarithmic scales to model phenomena involving small and large quantities and change (AC9M10M02)
Original				
Proposed			model situations involving scale and ratio in two-dimensions and solve related practical problems (AC9M9M04)	model situations involving scale, ratios and rates relating to objects in two and three-dimensions and solve related practical problems (AC9M10M03)
Original				
Proposed		model situations (including financial contexts) using proportional thinking to indirectly measure quantities and solve problems involving rates, interpreting the results in terms of the situation (AC9M8M05)	explore the relationship between graphs and equations corresponding to rate problems and solve problems involving direct proportion (AC9M9M05)	
Original				
Proposed			recognise that all measurements are estimates and calculate and interpret absolute, relative and percentage errors in measurements (AC9M9M06)	identify levels of accuracy and the sources of measurement errors in practical contexts and investigate the impact of measurement errors on results (AC9M10M04)

Strand				
Original	***Measurement and Geometry***			
Proposed	***Space***			
Sub-strand (original): Shape	**Year 7** *Students learn to:*	**Year 8** *Students learn to:*	**Year 9** *Students learn to:*	**Year 10** *Students learn to:*
Original	Draw different views of prisms and solids formed from combinations of prisms (ACMMG161)			
Proposed	explore different ways of representing objects in two-dimensions. Discuss and reason about the advantages and disadvantages of each representation (AC9M7SP01)			

Sub-strand (original): Location and transformation	**Year 7** *Students learn to:*	**Year 8** *Students learn to:*	**Year 9** *Students learn to:*	**Year 10** *Students learn to:*
Original	Describe translations, reflections in an axis and rotations of multiples of 90° on the Cartesian plane using coordinates. Identify line and rotational symmetries (ACMMG181)			

Proposed	use coordinates to describe transformations in the Cartesian plane of a set of points using translations, reflections on an axis, and rotations of multiples of right angles (AC9M7SP03)	explore different ways of representing and describing the position and location in three-dimensions including using a three-dimensional coordinate system with the use of dynamic geometric software and other technologies (AC9M8SP01)		

Strand				
Original	***Measurement and Geometry***			
Proposed	***Measurement*** ***Space***			
Sub-strand (original): Geometric reasoning	**Year 7** *Students learn to:*	**Year 8** *Students learn to:*	**Year 9** *Students learn to:*	**Year 10** *Students learn to:*
Original	Identify corresponding, alternate and co-interior angles when two straight lines are crossed by a transversal (ACMMG163)	Define congruence of plane shapes using transformations (ACMMG200)	Use the enlargement transformation to explain similarity and develop the conditions for triangles to be similar (ACMMG220)	Formulate proofs involving congruent triangles and angle properties (ACMMG243)
Proposed	establish relationships between angles formed when parallel lines are crossed by a transversal including a perpendicular line. Apply knowledge of vertically	establish and explain the conditions for sets of common shapes to be congruent or similar and relate these to transformations of the plane giving reasons (AC9M8SP03)	apply the enlargement transformation to shapes and objects using dynamic geometric software as appropriate. Identify and explain aspects that remain	See below (AC9M10SP02)

	opposite, complementary, supplementary, corresponding, alternate and co-interior angles to solve problems and explain reasoning (AC9M7M05)		the same and those that change (AC9M9SP03)	
Original		Develop the conditions for congruence of triangles (ACMMG201)	Solve problems using ratio and scale factors in similar figures (ACMMG221)	Apply logical reasoning, including the use of congruence and similarity, to proofs and numerical exercises involving plane shapes (ACMMG244)
Proposed		See above (AC9M8SP03)	See above (AC9M9M04)	apply logical reasoning (including the use of congruence and similarity) to proofs involving shapes in the plane and apply theorems to solve spatial problems (AC9M10SP02)
Original	Investigate conditions for two lines to be parallel and solve simple numerical problems using reasoning (ACMMG164)			
Proposed	See above (AC9M7M05)			
Original	Demonstrate that the angle sum of a triangle is 180° and use this to find the angle sum of a quadrilateral (ACMMG166)	Establish properties of quadrilaterals using congruent triangles and angle properties, and solve related numerical problems using reasoning (ACMMG202)		
Proposed	demonstrate that the angle sum of a triangle in the plane	establish properties of quadrilaterals using congruent		

	is 180°. Use this to determine the angle sum of other two-dimensional shapes and to indirectly determine the size of unknown angles in practical contexts (AC9M7M06)	triangles and angle properties and solve related numerical problems using reasoning (AC9M8SP02)		
Original	Classify triangles according to their side and angle properties and describe quadrilaterals (ACMMG165)			
Proposed	classify triangles, quadrilaterals and other shapes according to their side and angle properties, identify and reason about relationships (AC9M7SP02)			
Original				
Proposed	apply computational thinking to design and create an algorithm that will sort and classify shapes (AC9M7SP04)	apply computational thinking to evaluate and refine algorithms designed to identify similar or congruent shapes (AC9M8SP04)	apply computational thinking to construct, evaluate and refine algorithms designed to test spatial conjectures (AC9M9SP04)	apply computational thinking to solving spatial problems (AC9M10SP03)

Sub-strand (original): Pythagoras and trigonometry	Year 7 *Students learn to:*	Year 8 *Students learn to:*	Year 9 *Students learn to:*	Year 10 *Students learn to:*
Original		*Moved from Year 9*	Investigate Pythagoras' Theorem and its application to solving simple problems involving right angled triangles (ACMMG222)	Solve right-angled triangle problems including those involving direction and angles of elevation and depression (ACMMG245)
Proposed		investigate Pythagoras' theorem and its application to solving problems involving right-angled triangles (AC9M8M07)	apply angle properties, scale, similarity, Pythagoras' theorem and trigonometry in right angled triangles to solve practical problems (AC9M9M07)	apply trigonometry of right angles triangles and Pythagoras' theorem to model and solve practical problems in two and three-dimensions including those involving direction and angles of elevation and depression (AC9M10M05)
Original			Use similarity to investigate the constancy of the sine, cosine and tangent ratios for a given angle in right-angled triangles (ACMMG223)	
Proposed			recognise the constancy of the sine, cosine and tangent ratios for a given angle in right-angled triangles using similarity (AC9M9SP02)	

Original			Apply trigonometry to solve right-angled triangle problems (ACMMG224)	
Proposed			See above (AC9M9M07)	
Original				
Proposed			recognise Euler's formula can be applied to different types of problems including problems relating to planar graphs, platonic solids and other polyhedra (AC9M9SP01)	model practical situations as a network and use network diagrams to specify relationships and connectedness (AC9M10SP01)

Strand				
Original	***Statistics and Probability***			
Proposed	***Probability*** ***Statistics***			
Sub-strand (original): Chance	**Year 7** *Students learn to:*	**Year 8** *Students learn to:*	**Year 9** *Students learn to:*	**Year 10** *Students learn to:*
Original	Construct sample spaces for single-step experiments with equally likely outcomes (ACMSP167)	Identify complementary events and use the sum of probabilities to solve problems (ACMSP204)	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)	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)

Proposed	list the sample space for single-step events. Assign probabilities to the outcomes of these events and determine probabilities for related events (AC9M7P01)	use observations and design and conduct experiments and simulations to explore and identify complementary and mutually exclusive events (AC9M8P03)	list all outcomes for two-step chance events both with and without replacement using tree diagrams or arrays. Assign probabilities to outcomes and determine probabilities for events (AC9M9P01)	use probability, random variables and simulations to model phenomena, including sampling with and without replacement, and evaluate results (AC9M10P02)
Original	Assign probabilities to the outcomes of events and determine probabilities for events (ACMSP168)	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)	Calculate relative frequencies from given or collected data to estimate probabilities of events involving 'and' or 'or' (ACMSP226)	Use the language of 'if .... then, 'given', 'of', 'knowing that' to investigate conditional statements and identify common mistakes in interpreting such language (ACMSP247)
Proposed	use probability to predict the expected number of favourable outcomes for an event. Compare this with simulated results of an increasingly large number of trials explaining the differences between observed and expected results (AC9M7P02)	determine all possible combinations for two events A and B and use the relation Pr(A and B) + Pr(A and not B) + Pr(not A and B) + Pr(not A and not B) = 1 with two-way tables and Venn diagrams and apply to practical probability problems (AC9M8P02)	investigate and determine the probabilities of compound events using proportional reasoning and relate to the use of the language 'and', inclusive 'or', and exclusive 'or' (AC9M9P02)	use the language of 'if .... then, 'given', 'of', 'knowing that' to investigate conditional statements and identify common mistakes in interpreting such language (AC9M10P01
Original		Represent events in two-way tables and Venn diagrams and solve related problems (ACMSP292)	Investigate reports of surveys in digital media and elsewhere for information on how data were obtained to estimate population means and medians (ACMSP227)	

Proposed		See below (AC9M8P01)	investigate reports of surveys in digital media and elsewhere for information on how data was obtained to estimate population means and medians. Explain how different sampling methods can affect the results of surveys and how choice of representation could be employed to support a particular point of view (AC9M9ST01)	
Original				
Proposed		recognise that complementary events have a combined probability of 1 and that for a single event *A*, Pr(*A*) + Pr(not*A*) = 1. Use these relationships to calculate probabilities related to practical problems (AC9M8P01)	design and conduct experiments or simulations that demonstrate the relationship between combined conditions for events and the probability of individual events (AC9M9P03)	design and use probability simulations to model and investigate situations including problems involving compound events and simulations that use conditional statements to produce different outcomes. Apply reasoning to evaluate and report on their effectiveness (AC9M10P03)

Strand				
Original	***Statistics and Probability***			
Proposed	***Statistics***			
Sub-strand (original): Data representation and interpretation	**Year 7** *Students learn to:*	**Year 8** *Students learn to:*	**Year 9** *Students learn to:*	**Year 10** *Students learn to:*
Original	Identify and investigate issues involving numerical data collected from primary and secondary sources (ACMSP169)	Investigate techniques for collecting data, including census, sampling and observation (ACMSP284)	Identify everyday questions and issues involving at least one numerical and at least one categorical variable, and collect data directly and from secondary sources (ACMSP228)	Determine quartiles and interquartile range (ACMSP248)
Proposed	make and justify decisions of which measure(s) of central tendency provide(s) useful insights into the nature of the distribution of data in a given context (AC9M7ST02)	investigate techniques for data collection including census, sampling and observation and discuss the practicalities and implications of obtaining data through these techniques (AC9M8ST01)	plan, conduct and review statistical investigations involving comparative analysis of multiple univariate data sets collected directly or from secondary sources (AC9M9ST04)	*Removed*
Original	Construct and compare a range of data displays including stem-and-leaf plots and dot plots (ACMSP170)	Explore the practicalities and implications of obtaining data through sampling using a variety of investigative processes (ACMSP206)	Construct back-to-back stem and-leaf plots and histograms and describe data, using terms including ‘skewed’, ‘symmetric’ and ‘bi	

			modal' (ACMSP282)	
Proposed	construct a range of stem-and-leaf and dot plots with appropriate intervals and partition these plots to interpret and compare the distributions including determining the range, median, mean and mode (AC9M7ST01)	analyse and report on the distribution of data from primary and secondary sources using various sampling techniques to select and study samples (AC9M8ST02)	represent the distribution of multiple numerical data sets using comparative representations (including back-to-back stem-and-leaf plots and grouped histograms). Compare data with consideration of centre, spread and shape (AC9M9ST02)	plan, conduct and review statistical investigations of association and trend in bivariate numerical data. Discuss association in terms of strength, direction and linearity (AC9M10ST05)
Original	Calculate mean, median, mode and range for sets of data. Interpret these statistics in the context of data (ACMSP171)	Explore the variation of means and proportions of random samples drawn from the same population (ACMSP293)	Compare data displays using mean, median and range to describe and interpret numerical data sets in terms of location (centre) and spread (ACMSP283)	Compare shapes of box plots to corresponding histograms and dot plots (ACMSP250)
Proposed	create different types of displays or visualisations using software where appropriate. Describe and compare the distribution of data commenting on the spread (including outliers) and determine the range, median, mean and mode (AC9M7ST03)	compare different random samples of the same size drawn from the same population with respect to variations in proportions, means, medians and range and explore the effect of possible outliers on these measures (AC9M8ST03)	See above (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)

Original	Describe and interpret data displays using median, mean and range (ACMSP172)	Investigate the effect of individual data values, including outliers, on the mean and median (ACMSP207)		Use scatter plots to investigate and comment on relationships between two numerical variables (ACMSP251)
Proposed	See above (AC9M7ST03)	See above (AC9M8ST03)	choose appropriate forms of display or visualisation for a given type of data, justify selections and interpret displays with respect to statistical questions of interest for a given context (AC9M9ST03)	create and use scatterplots to investigate and comment on the relationships between two numerical variables. Describe the relationship and discuss any conclusions that may be drawn (AC9M10ST03)
Original				Investigate and describe bivariate numerical data where the independent variable is time (ACMSP252)
Proposed	plan and conduct plan and conduct statistical investigations that produce numerical data sets. Represent the data using appropriate displays. Analyse and interpret data distributions reporting results in terms of summary statistics (AC9M7ST04)	plan and conduct statistical investigations based on the relationship between samples and a population and consideration of the context. Use ethical, fair, and efficient methods for gathering relevant data (AC9M8ST04)		recognise and explore associations between categorical variables using two-way (contingency) tables and identify and discuss possible relationships (AC9M10ST04)
Original				Evaluate statistical reports in the media and other places by linking claims to displays,

				statistics and representative data (ACMSP253)
Proposed				evaluate statistical reports in the media in terms of questions posed, data gathering and representation of distributions. Analyse claims and inferences, including ethical considerations and identification of potential sources of bias (AC9M10ST01)

Achievement standard Year 7 to Year 10

	Year 7	Year 8	Year 9	Year 10
Original	By the end of Year 7, students solve problems involving the comparison, 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 percentages and all four operations with fractions and decimals. They compare the cost of items to make financial decisions. Students represent numbers using variables. They connect the	By the end of Year 8, students solve everyday problems involving rates, ratios and percentages. They describe index laws and apply them to whole numbers. They describe rational and irrational numbers. Students solve problems involving profit and loss. They make connections between expanding and factorising algebraic expressions. Students solve problems relating to the volume of prisms. They make sense of time duration in real applications. They identify conditions for the congruence of triangles and deduce the properties	By the end of Year 9, students solve problems involving simple interest. They interpret ratio and scale factors in similar figures. Students explain similarity of triangles. They recognise the connections between similarity and the trigonometric ratios. Students compare techniques for collecting data from primary and secondary sources. They make sense of the position of the mean and median in skewed, symmetric and bi-modal displays to describe	By the end of Year 10, students recognise the connection between simple and compound interest. They solve problems involving linear equations and inequalities. They make the connections between algebraic and graphical representations of relations. Students solve surface area and volume problems relating to composite solids. They recognise the relationships between parallel and perpendicular lines. Students apply deductive reasoning to proofs and

	laws and properties for numbers to algebra. They interpret simple linear representations and model authentic information. Students describe different views of three-dimensional objects. They represent transformations in the Cartesian plane. They solve simple numerical problems involving angles formed by a transversal crossing two lines. Students identify issues involving the collection of continuous data. They describe the relationship between the median and mean in data displays. Students use fractions, decimals and percentages, and their equivalences. They express one quantity as a fraction or percentage of another. Students solve simple linear equations and evaluate algebraic expressions after numerical substitution. They assign ordered pairs to given points	of quadrilaterals. Students model authentic situations with two-way tables and Venn diagrams. They choose appropriate language to describe events and experiments. They explain issues related to the collection of data and the effect of outliers on means and medians in that data. Students use efficient mental and written strategies to carry out the four operations with integers. They simplify a variety of algebraic expressions. They solve linear equations and graph linear relationships on the Cartesian plane. Students convert between units of measurement for area and volume. They perform calculations to determine perimeter and area of parallelograms, rhombuses and kites. They name the features of circles and calculate the areas and circumferences of circles. Students determine the probabilities of complementary events and calculate the sum of probabilities.	and interpret data. Students apply the index laws to numbers and express numbers in scientific notation. They expand binomial expressions. They find the distance between two points on the Cartesian plane and the gradient and midpoint of a line segment. They sketch linear and non-linear relations. Students calculate areas of shapes and the volume and surface area of right prisms and cylinders. They use Pythagoras' Theorem and trigonometry to find unknown sides of right-angled triangles. Students calculate relative frequencies to estimate probabilities, list outcomes for two-step experiments and assign probabilities for those outcomes. They construct histograms and back-to-back stem-and-leaf plots.	numerical exercises involving plane shapes. They compare data sets by referring to the shapes of the various data displays. They describe bivariate data where the independent variable is time. Students describe statistical relationships between two continuous variables. They evaluate statistical reports. Students expand binomial expressions and factorise monic quadratic expressions. They find unknown values after substitution into formulas. They perform the four operations with simple algebraic fractions. Students solve simple quadratic equations and pairs of simultaneous equations. They use triangle and angle properties to prove congruence and similarity. Students use trigonometry to calculate unknown angles in right-angled triangles. Students list outcomes for multi-step chance experiments and assign probabilities for these experiments. They

	on the Cartesian plane. Students use formulas for the area and perimeter of rectangles and calculate volumes of rectangular prisms. Students classify triangles and quadrilaterals. They name the types of angles formed by a transversal crossing parallel line. Students determine the sample space for simple experiments with equally likely outcomes and assign probabilities to those outcomes. They calculate mean, mode, median and range for data sets. They construct stem-and-leaf plots and dot-plots.			calculate quartiles and inter-quartile ranges.
Proposed	By the end of Year 7, students use all four operations in calculations involving positive fractions and decimals, using the properties of number systems and choosing the computational approach. They represent natural numbers in expanded form and as products of prime	By the end of Year 8, students recognise the relationship between fractions and their terminating or recurring decimal expansion. They apply the exponent laws to calculations with numbers involving non-negative exponents. Students solve problems involving the four operations with integers and positive rational numbers, using mental, written and digital tools as	By the end of Year 9, students use real numbers to solve problems. They extend and apply the exponent laws with positive integers to variables when factorising expressions. Students model situations involving change and solve linear and quadratic equations numerically, graphically and	By the end of Year 10, students model situations and apply computational approaches to solving problems. They use digital tools to obtain and investigate and discuss the effect of approximations of exact irrational real numbers in combined and repeated calculations. Students use

	factors, using exponent notation. Students model and solve problems involving addition and subtraction of integers. They determine equivalent representations of rational numbers and choose from fraction, decimal and percentage forms to assist in computations. They solve problems involving rational numbers, percentages and ratios and explain their choice of representation of rational numbers and results when they model situations, including those in financial contexts. They use algebraic expressions to model situations and represent formulas. Students substitute values into these formulas to determine unknown values and interpret these in the context. They use computational thinking and digital tools to generate tables of values related to algebraic expressions including formulas,	appropriate. They apply proportional reasoning to solve practical problems involving ratios, percentage change, proportions of quantities and rates in measurement and financial contexts. Students apply algebraic properties to rearrange, expand and factorise linear expressions. They apply linear relations to model situations, representing these with tables, graphs and algebraically, and solve related equations interpreting them in context. Students apply computational thinking with digital tools to make and investigate conjectures involving rational numbers. They choose and use suitable metric units when solving measurement problems involving the perimeter and area of composite shapes, and volume and capacity of prisms. Students use Pythagoras' theorem to solve simple measurement problems involving unknown lengths and apply formulas to solve problems involving area and circumference of circles. They solve problems of duration involving 12-hour and 24-	algebraically using inverse operations and by expanding and factorising algebraic expressions, using digital tools as appropriate. They describe the effects of variation of parameters on functions and relations and their graphical and algebraic representations, using computational thinking to generalise connections between them. Students apply formulas to solve practical problems involving the surface area and volume of right prisms and cylinders. They solve practical problems involving ratio, similarity and scale in two-dimensional situations. Students apply Pythagoras' theorem and use trigonometric ratios to solve practical problems involving right angled triangles. They model situations and solve problems involving finance, measurement and direct proportion interpreting solutions in context. Students	algebraic techniques to model phenomena, including financial applications, growth and decay and applying linear, quadratic and exponential functions as appropriate. They solve related algebraic equations, numerically, graphically and using computational thinking and digital tools. Students solve problems involving parallel and perpendicular lines. They formulate, solve, and interpret solutions to problems involving linear inequalities and simultaneous linear equations in two variables graphically. Students use and interpret logarithmic scales representing small or large quantities or change in applied contexts. They solve practical measurement problems involving surface area and volumes of objects and composite solids. Students apply Pythagoras' theorem and trigonometry to solve spatial problems involving right angled triangles. They

	evaluating the effect of variation. Students apply knowledge of angle relationships involving parallel lines and a transversal, and the sum of angles in a triangle to solve problems, giving reasons. They develop, explain and apply measurement formulas involving the areas of triangles and parallelograms and the volumes of rectangular and triangular prisms to solve practical problems Students describe the relationships between the radius, diameter and circumference of a circle. They classify polygons and other shapes according to their features and represent objects two-dimensionally in different ways reasoning about these representations. Students use coordinates to describe transformations of points in the plane. They plan and conduct statistical investigations	hour cycles across multiple time zones. Students use three dimensions to locate and describe position in three-dimensional contexts. They apply computational thinking to evaluate algorithms designed to test for congruency and similarity of shapes and use these conditions to transform shapes in the plane and solve related problems. Students conduct statistical investigations recognising the implications of obtaining data through sampling. They analyse and report on primary and secondary data from a range of contexts. Students compare the distributions of random samples of the same size from a given population with respect to variation, measures of central tendency and range, with consideration of the effects of outliers. They represent the possible combinations of two events with tables and diagrams and determine related probabilities to solve practical problems. Students design and conduct experiments and simulations to explore and identify complementary	express small and large numbers in scientific notation and use this form in measurement contexts. They determine errors in measurements and interpret their effect on results. Students apply the enlargement transformation to images of shapes and objects and identify and describe attributes that change or are invariant. They apply Euler's formula to solve problems relating to planar graphs and polyhedrons. Students create and use algorithms to test spatial conjectures. They compare and analyse the distributions of multiple univariate data sets, choosing representations with respect to the questions under investigation and describe features of these including consideration of summary statistics, symmetry and skew. Students obtain data from primary and secondary sources and	consider levels of accuracy and sources of error in measurement with instruments, and the possible impact of these when applying measurement formulas. Students describe and apply geometric theorems to solve problems, giving reason for solutions. They use networks to model relationships, interpret situations and describe connectedness. Students design and conduct statistical investigations involving bivariate numerical data. They represent the distribution of data involving two variables using tables and scatter plots and discuss possible association. Students consider association between numerical variables including trend data when time is one of the variables. They critically analyse media in terms of the claims and conclusions, noting limitations and potential sources of bias. Students represent and compare the distribution of data for a

	involving numerical data, use appropriate displays to represent the distribution and interpret this data in terms of summary statistics, with informal consideration of possible outliers. Students decide which central measure (mean, median or mode) is most suitable and explain their reasoning. They list sample spaces for single step experiments, assign probabilities to outcomes, determine probabilities for related events and compare these to results obtained empirically, giving reasons for differences between expected and observed results.	and mutually exclusive events and calculate related probabilities.	explain how sampling techniques and representation can be used to support or question conclusions or to promote a point of view. They determine sets of outcomes for compound events and represent these in various ways and assign probabilities to these events. Students design and conduct experiments or simulations to gather empirical data.	continuous variable using various displays and discuss distributions in terms of summary statistics and their features. They apply conditional probability and independence to solve problems involving compound events, using diagrams. Students use computational thinking and reasoning to solve spatial problems and design and conduct simulations modelling phenomena involving compound events including conditional probability.