



# BitMaths

NSW Syllabus Match  
**Stage 4**

BitMaths covers all strands and sub-strands for Stage 4. Refer to the table to match content descriptions to the relevant BitMaths modules.

**Note:** **NA401** The Four Operations covers the Stage 3 content descriptions ‘Select and apply efficient mental and written strategies and appropriate digital technologies to solve problems involving addition and subtraction with whole numbers (ACMNA123)’ and ‘Select and apply efficient mental and written strategies and appropriate digital technologies to solve problems involving multiplication and division with whole numbers (ACMNA123)’.

Stage 4 Syllabus Match				
Strand	Sub-strand	Outcomes	Content Description/s	Module/s
Number and Algebra	Computation with Integers	MA4-1WM communicates and connects mathematical ideas using appropriate terminology, diagrams and symbols	Apply the associative, commutative and distributive laws to aid mental and written computation (ACMNA151)	<b>NA402</b> Laws of Arithmetic
		MA4-2WM applies appropriate mathematical techniques to solve problems	Compare, order, add and subtract integers (ACMNA280)	<b>NA403</b> Adding and Subtracting Integers
		MA4-3WM recognises and explains mathematical relationships using reasoning	Carry out the four operations with rational numbers and integers, using efficient mental and written strategies and appropriate digital technologies (ACMNA183)	<b>NA404</b> Operations with Integers and Fractions
		MA4-4NA compares, orders and calculates with integers, applying a range of strategies to aid computation		
	Fractions, Decimals and Percentages	MA4-1WM communicates and connects mathematical ideas using appropriate terminology, diagrams and symbols MA4-2WM applies appropriate mathematical techniques to solve problems MA4-3WM recognises and explains mathematical relationships using reasoning MA4-5NA operates with fractions, decimals and percentages	Compare fractions using equivalence; locate and represent positive and negative fractions and mixed numerals on a number line (ACMNA152)	<b>NA405</b> Equivalent Fractions
			Solve problems involving addition and subtraction of fractions, including those with unrelated denominators (ACMNA153)	<b>NA406</b> Adding and Subtracting Fractions
			Multiply and divide fractions and decimals using efficient written strategies and digital technologies (ACMNA154)	<b>NA407</b> Multiplying and Dividing Fractions and Decimals
			Express one quantity as a fraction of another, with and without the use of digital technologies (ACMNA155)	<b>NA408</b> Expressing Quantities as Fractions
			Round decimals to a specified number of decimal places (ACMNA156)	<b>NA409</b> Rounding Decimals
			Investigate terminating and recurring decimals (ACMNA184)	<b>NA410</b> Terminating and Recurring Decimals
			Connect fractions, decimals and percentages and carry out simple conversions (ACMNA157)	<b>NA411</b> Converting Between Fractions, Decimals and Percentages
			Investigate the concept of irrational numbers, including $\pi$ (ACMNA186)	<b>NA412</b> Rational and Irrational Numbers
			Find percentages of quantities and express one quantity as a percentage of another, with and without the use of digital technologies (ACMNA158)	<b>NA413</b> Finding Percentages
			Solve problems involving the use of percentages, including percentage increases and decreases, with and without the use of digital technologies (ACMNA187)	<b>NA414</b> Using Percentages

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Number and Algebra	Financial Mathematics	MA4-1WM communicates and connects mathematical ideas using appropriate terminology, diagrams and symbols	Investigate and calculate the Goods and Services Tax (GST), with and without the use of digital technologies (Stage 4 Financial Mathematics)	<b>NA415</b> GST
		MA4-2WM applies appropriate mathematical techniques to solve problems	Investigate and calculate 'best buys', with and without the use of digital technologies (ACMNA174)	<b>NA416</b> Discounts
		MA4-3WM recognises and explains mathematical relationships using reasoning	Solve problems involving profit and loss, with and without the use of digital technologies (ACMNA189)	<b>NA417</b> Profit and Loss
		MA4-6NA solves financial problems involving purchasing goods		
	Ratios and Rates	MA4-1WM communicates and connects mathematical ideas using appropriate terminology, diagrams and symbols	Recognise and solve problems involving simple ratios (ACMNA173)	<b>NA418</b> Ratios
		MA4-2WM applies appropriate mathematical techniques to solve problems	Solve a range of problems involving ratios and rates, with and without the use of digital technologies (ACMNA188)	<b>NA419</b> Ratios and Rates
		MA4-3WM recognises and explains mathematical relationships using reasoning	Investigate, interpret and analyse graphs from authentic data (ACMNA180)	<b>NA420</b> Travel Graphs
		MA4-7NA operates with ratios and rates, and explores their graphical representation		
	Algebraic Techniques 1	MA4-1WM communicates and connects mathematical ideas using appropriate terminology, diagrams and symbols	Introduce the concept of variables as a way of representing numbers using letters (ACMNA175)	<b>NA421</b> Variables in Algebra
		MA4-3WM recognises and explains mathematical relationships using reasoning	Extend and apply the laws and properties of arithmetic to algebraic terms and expressions (ACMNA177)	<b>NA422</b> Applying Laws of Arithmetic to Algebra
		MA4-8NA generalises number properties to operate with algebraic expressions	Simplify algebraic expressions involving the four operations (ACMNA192)	<b>NA423</b> Simplifying Algebraic Expressions
	Algebraic Techniques 2	MA4-1WM communicates and connects mathematical ideas using appropriate terminology, diagrams and symbols	Create algebraic expressions and evaluate them by substituting a given value for each variable (ACMNA176)	<b>NA424</b> Substitution in Algebra
		MA4-2WM applies appropriate mathematical techniques to solve problems	Extend and apply the distributive law to the expansion of algebraic expressions (ACMNA190)	<b>NA425</b> Expanding Algebraic Expressions
		MA4-3WM recognises and explains mathematical relationships using reasoning	Factorise algebraic expressions by identifying numerical factors (ACMNA191)	<b>NA426</b> Factorising Algebraic Expressions
		MA4-8NA generalises number properties to operate with algebraic expressions	Factorise algebraic expressions by identifying algebraic factors (Stage 4 Algebraic Techniques 2)	

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Number and Algebra	Indices	MA4-1WM communicates and connects mathematical ideas using appropriate terminology, diagrams and symbols	Investigate index notation and represent whole numbers as products of powers of prime numbers (ACMNA149)	<b>NA427</b> Index Notation <b>NA428</b> Prime Factorisation	
		MA4-2WM applies appropriate mathematical techniques to solve problems	Investigate and use square roots of perfect square numbers (ACMNA150)	<b>NA429</b> Square and Cube Numbers	
		MA4-3WM recognises and explains mathematical relationships using reasoning	Use index notation with numbers to establish the index laws with positive-integer indices and the zero index (ACMNA182)	<b>NA430</b> Index Laws	
	Equations	MA4-9NA operates with positive-integer and zero indices of numerical bases	MA4-1WM communicates and connects mathematical ideas using appropriate terminology, diagrams and symbols	Solve simple linear equations (ACMNA179)	<b>NA431</b> Solving Simple Linear Equations
			MA4-2WM applies appropriate mathematical techniques to solve problems	Solve simple quadratic equations (Stage 4 Equations)	<b>NA432</b> Solving Simple Quadratic Equations
		MA4-3WM recognises and explains mathematical relationships using reasoning			
		MA4-10NA uses algebraic techniques to solve simple linear and quadratic equations			
	Linear Relationships	MA4-1WM communicates and connects mathematical ideas using appropriate terminology, diagrams and symbols	MA4-3WM recognises and explains mathematical relationships using reasoning	Given coordinates, plot points on the Cartesian plane, and find coordinates for a given point (ACMNA178)	<b>NA433</b> The Cartesian Plane
			MA4-11NA creates and displays number patterns; graphs and analyses linear relationships; and performs transformations on the Cartesian plane	Plot linear relationships on the Cartesian plane, with and without the use of digital technologies (ACMNA193)	<b>NA434</b> Linear Relationships
		Solve linear equations using algebraic techniques and verify solutions by substitution (ACMNA194)	<b>NA435</b> Solving Linear Equations		
		Solve linear equations using graphical techniques (ACMNA194)			
Measurement and Geometry	Length	MA4-1WM communicates and connects mathematical ideas using appropriate terminology, diagrams and symbols	Find perimeters of parallelograms, trapeziums, rhombuses and kites (ACMMG196)	<b>MG401</b> Perimeter of Quadrilaterals	
		MA4-2WM applies appropriate mathematical techniques to solve problems	Investigate the relationship between features of circles, such as the circumference, radius and diameter; use formulas to solve problems involving circumference (ACMMG197)	<b>MG402</b> Circumference of Circles	
		MA4-12MG calculates the perimeters of plane shapes and the circumferences of circles			

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Measurement and Geometry	Area	MA4-1WM communicates and connects mathematical ideas using appropriate terminology, diagrams and symbols	Establish the formulas for areas of rectangles, triangles and parallelograms and use these in problem solving (ACMMG159)	<b>MG403</b> Formulas for Areas	
		MA4-2WM applies appropriate mathematical techniques to solve problems	Find areas of trapeziums, rhombuses and kites (ACMMG196)	<b>MG404</b> Area of Quadrilaterals	
		MA4-13MG uses formulas to calculate the areas of quadrilaterals and circles, and converts between units of area	Investigate the relationship between features of circles, such as the area and the radius; use formulas to solve problems involving area (ACMMG197)	<b>MG405</b> Area of Circles	
	Volume		MA4-1WM communicates and connects mathematical ideas using appropriate terminology, diagrams and symbols  MA4-2WM applies appropriate mathematical techniques to solve problems  MA4-14MG uses formulas to calculate the volumes of prisms and cylinders, and converts between units of volume	Draw different views of prisms and solids formed from combinations of prisms (ACMMG161)	<b>MG406</b> Views of Prisms and Solids
				Choose appropriate units of measurement for area and convert from one unit to another (ACMMG195)	<b>MG407</b> Units of Area and Volume
				Choose appropriate units of measurement for volume and convert from one unit to another (ACMMG195)	
				Develop the formulas for the volumes of rectangular and triangular prisms and of prisms in general; use formulas to solve problems involving volume (ACMMG198)	<b>MG408</b> Volume of Prisms
				Calculate the volumes of cylinders and solve related problems (ACMMG217)	<b>MG409</b> Volume of Cylinders
	Time		MA4-1WM communicates and connects mathematical ideas using appropriate terminology, diagrams and symbols  MA4-2WM applies appropriate mathematical techniques to solve problems  MA4-15MG performs calculations of time that involve mixed units, and interprets time zones	Solve problems involving duration, including using 12-hour and 24-hour time within a single time zone (ACMMG199)	<b>MG410</b> Solving Time Problems
				Solve problems involving international time zones (Stage 4 Time)	<b>MG411</b> International Time
	Right-Angled Triangles (Pythagoras)		MA4-1WM communicates and connects mathematical ideas using appropriate terminology, diagrams and symbols  MA4-2WM applies appropriate mathematical techniques to solve problems  MA4-16MG applies Pythagoras' theorem to calculate side lengths in right-angled triangles, and solves related problems	Investigate pythagoras-theorem and its application to solving simple problems involving right-angled triangles (ACMMG222)	<b>MG412</b> Pythagoras' Theorem

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Strand	Sub-strand	Outcomes	Content Description/s	Module/s
Measurement and Geometry	Properties of Geometrical Figures 1	MA4-1WM communicates and connects mathematical ideas using appropriate terminology, diagrams and symbols	Classify triangles according to their side and angle properties and describe quadrilaterals (ACMMG165)	<b>MG413</b> Classifying Triangles and Quadrilaterals
		MA4-2WM applies appropriate mathematical techniques to solve problems	Use the language, notation and conventions of geometry (Stage 4 Angle Relationships)	
		MA4-3WM recognises and explains mathematical relationships using reasoning	Describe translations, reflections in an axis, and rotations of multiples of $90^\circ$ on the Cartesian plane using coordinates (ACMMG181)	<b>MG414</b> Reflections and Translations
		MA4-17MG classifies, describes and uses the properties of triangles and quadrilaterals, and determines congruent triangles to find unknown side lengths and angles	Describe translations, reflections in an axis, and rotations of multiples of $90^\circ$ on the Cartesian plane using coordinates (ACMMG181)	<b>MG415</b> Rotations
			Identify line and rotational symmetries (ACMMG181)	
	Demonstrate that the angle sum of a triangle is $180^\circ$ and use this to find the angle sum of a quadrilateral (ACMMG166)	<b>MG416</b> Angle Sums of Triangles and Quadrilaterals		
	Properties of Geometrical Figures 2	MA4-1WM communicates and connects mathematical ideas using appropriate terminology, diagrams and symbols	Define congruence of plane shapes using transformations (ACMMG200)	<b>MG417</b> Congruence
		MA4-2WM applies appropriate mathematical techniques to solve problems	Develop the conditions for congruence of triangles (ACMMG201)	<b>MG418</b> Congruence of Triangles
		MA4-3WM recognises and explains mathematical relationships using reasoning	Establish properties of quadrilaterals using congruent triangles and angle properties, and solve related numerical problems using reasoning (ACMMG202)	<b>MG419</b> Congruence of Quadrilaterals
	Angle Relationships	MA4-1WM communicates and connects mathematical ideas using appropriate terminology, diagrams and symbols	Identify corresponding, alternate and co-interior angles when two straight lines are crossed by a transversal (ACMMG163)	<b>MG420</b> Defining and Identifying Angles
			MA4-2WM applies appropriate mathematical techniques to solve problems	
		MA4-3WM recognises and explains mathematical relationships using reasoning	Recognise the geometrical properties of angles at a point (Stage 4 Angle Relationships)	<b>MG421</b> Investigating Parallel Lines
MA4-18MG identifies and uses angle relationships, including those related to transversals on sets of parallel lines		Investigate conditions for two lines to be parallel (ACMMG164)		
Solve simple numerical problems using reasoning (ACMMG164)				

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Strand	Sub-strand	Outcomes	Content Description/s	Module/s
Statistics and Probability	Data Collection and Representation	MA4-1WM communicates and connects mathematical ideas using appropriate terminology, diagrams and symbols	Investigate techniques for collecting data, including census, sampling and observation (ACMSP284)	SP401 Census and Sampling
		MA4-3WM recognises and explains mathematical relationships using reasoning	Explore the practicalities and implications of obtaining data through sampling using a variety of investigative processes (ACMSP206)	SP402 Data and Sampling
		MA4-19SP collects, represents and interprets single sets of data, using appropriate statistical displays	Identify and investigate issues involving numerical data collected from primary and secondary sources (ACMSP169)	SP403 Primary and Secondary Data
			Construct and compare a range of data displays, including stem-and-leaf plots and dot plots (ACMSP170)	SP404 Data Displays SP405 Divided Bar Graphs and Sector Graphs
	Single Variable Data Analysis	MA4-1WM communicates and connects mathematical ideas using appropriate terminology, diagrams and symbols	Calculate mean, median, mode and range for sets of data and interpret these statistics in the context of data (ACMSP171)	SP406 Calculating Mean, Median, Mode and Range
		MA4-2WM applies appropriate mathematical techniques to solve problems	Investigate the effect of individual data values, including outliers, on the mean and median (ACMSP207)	SP407 The Effect of Individual Data Values
		MA4-3WM recognises and explains mathematical relationships using reasoning	Describe and interpret data displays using mean, median and range (ACMSP172)	SP408 Interpreting Data Displays
		MA4-20SP analyses single sets of data using measures of location, and range	Explore the variation of means and proportions of random samples drawn from the same population (ACMSP293)	SP409 Variation in Data
	Probability 1	MA4-1WM communicates and connects mathematical ideas using appropriate terminology, diagrams and symbols	Construct sample spaces for single-step experiments with equally likely outcomes (ACMSP167)	SP410 Sample Spaces
		MA4-2WM applies appropriate mathematical techniques to solve problems	Assign probabilities to the outcomes of events and determine probabilities for events (ACMSP168)	SP411 Assigning Probabilities
		MA4-3WM recognises and explains mathematical relationships using reasoning	Identify complementary events and use the sum of probabilities to solve problems (ACMSP204)	SP412 Complementary Events
	Probability 2	MA4-1WM communicates and connects mathematical ideas using appropriate terminology, diagrams and symbols	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)	SP413 Probability Events
		MA4-2WM applies appropriate mathematical techniques to solve problems	Represent events in two-way tables and Venn diagrams and solve related problems (ACMSP292)	SP414 Venn Diagrams and Two-way Tables
		MA4-3WM recognises and explains mathematical relationships using reasoning		
	MA4-21SP represents probabilities of simple and compound events			