Mathletics

Australian Capital Territory – Australian Curriculum v9

Activities (Courses) and Skill Quests

Years 7 – 8
May, 2024

Mathletics

Year 7 – Skill Quests

1 Number and Algebra

Outcome	Quests	Content
AC9M7N01 - 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	Square numbers	Working with square numbers
	Square roots	Working with square roots
		Estimating square root of non-square numbers
AC9M7N02 - Represent natural numbers as products of powers of prime numbers using exponent notation	Exponents	Introducing exponents
	Prime factorisation	Prime factorisation
AC9M7N03 - Represent natural numbers in expanded notation using place value and powers of 10	Investigate with powers of 10	Investigating with powers of 10
AC9M7N04 - Find equivalent representations of rational numbers and represent rational numbers on a number line	Express & compare fractions	Fractions: comparing & ordering
	Improper & mixed numbers	Fractions: improper & proper fractions
	Fraction, decimal & percent conversions	Converting fractions to percentages
		Expressing quantities as a percentage
		Converting percentages to fractions
		Converting fractions to decimals
		Converting decimals to fractions
		Converting decimals to percentages
		Converting percentages to decimals
		Ordering fractions, decimals & percentages
AC9M7N05 - Round decimals to a given accuracy appropriate to the context and use appropriate rounding and estimation to check the reasonableness of solutions	Round decimals	Rounding decimals
AC9M7N06 - Use the 4 operations with positive rational numbers including fractions, decimals and percentages to solve problems using efficient calculation strategies	Add & subtract fractions	Fractions: adding fractions
		Fractions: subtracting with like denominators
		Fractions: subtracting with unlike denominators
		Fractions: adding & subtracting fractions

	Multiply fractions	Fractions: multiplying by a whole number
		Fractions: multiplying fractions
	Divide fractions	Dividing fractions & positive integers
		Dividing fractions by fractions
	Add & subtract decimals	Adding & subtracting decimals
	Multiply decimals	Multiplying decimals
	Divide decimals	Dividing decimals
	Percentage calculations	Calculations with percentages
	Word problems	Solving word problems
AC9M7N07 - Compare, order and solve problems involving addition and subtraction of integers	Integers	Comparing & ordering integers
		Adding & subtracting integers
		Solving problems involving integers
AC9M7N08 - Recognise, represent and solve problems involving ratios	Ratios	Using simple ratios
		Simplifying ratios
		Solving simple problems involving ratios
AC9M7N09 - 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	Percentages in financial context	Profit & loss
		Calculating best buys
	Solve problems with rational numbers	Solving problems with rational numbers
AC9M7A01 - Recognise and use variables to represent everyday formulas algebraically and substitute values into formulas to determine an unknown	Algebraic expressions & equations	Forming expressions & equations
	Substitution	Substituting into algebraic expressions & equations
AC9M7A02 - Formulate algebraic expressions using constants, variables, operations and brackets	Language of algebra	Understanding the language of algebra
	Simplify algebraic expressions	Simplifying: addition & subtraction
		Simplifying: multiplication & division
		Simplifying: commutative law
AC9M7A03 - Solve one-variable linear equations with natural number solutions; verify the solution by substitution	Solve equations	Introducing equations
		Solving 1-step equations: addition/subtraction
		Solving 1-step equations: multiplication
		Solving 1-step equations: division
		Solving 1-step equations: mixed operations

		Solving 2-step equations: variable in numerator
	5	Solving 2-step equations: variable in denominator
AC9M7A04 - Describe relationships between variables represented in graphs of functions from authentic data	Read graphs in real-life contexts	Understanding distance/time graphs
		Using distance/time graphs
AC9M7A05 - Generate tables of values from visually growing patterns or the rule of a function; describe and plot these relationships on the Cartesian plane	Algebraic patterns	Algebraic patterns
	Linear relationships	Table of values
		Graphing linear equations
AC9M7A06 - Manipulate formulas involving several variables using digital tools, and describe the effect of systematic variation in the values of the variables	Rearrange a formula	Rearranging a formula

2 Measurement and Space

Outcome	Quests	Content
AC9M7M01 - Solve problems involving the area of triangles and parallelograms using established formulas and appropriate units	Area: triangles & parallelograms	Calculating area: triangles
		Calculating area: parallelograms
AC9M7M02 - Solve problems involving the volume of right prisms including rectangular and triangular prisms, using established formulas and appropriate units	Develop a formula for calculating volume	Developing a formula for calculating volume
	Calculate volume	Calculating volume: rectangular prisms
		Calculating volume: triangular prisms
		Calculating dimensions from given volume
AC9M7M03 - Describe the relationship between π and the features of circles including the circumference, radius and diameter	Work with circles	Identifying parts of circles
		Calculating circumference
AC9M7M04 - 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	Angle relationships parallel lines	Parallel & perpendicular line conventions
		Angle relationships on parallel lines
	Parallel lines & geometric reasoning	Proving parallel lines
AC9M7M05 - 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	Interior angles of a triangle	Calculating sum of interior angles: triangle
		Calculating sum of interior angles: polygons
AC9M7M06 - 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	Teacher directed	
AC9M7SP01 - Represent objects in 2 dimensions; discuss and reason about the advantages and disadvantages of different representations	Explore different views of solids	Exploring different views of prisms and solids
		Prisms & cross-sections
		Prisms & cross-sections
AC9M7SP02 - Classify triangles, quadrilaterals and other polygons according to their side and angle properties; identify and reason about relationships	Triangles & quadrilaterals	Labelling & naming conventions
		Properties of triangles
		Convex & non-convex quadrilaterals
		Properties of quadrilaterals
		Reasoning: triangles & quadrilaterals

AC9M7SP03 - 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	Transformations	Describing transformations
		Plotting transformations
	Reflection	Performing reflections
	Rotation	Performing rotations
	Symmetry	Line & rotational symmetry
	Use transformations to identify measures	Using transformations to identify measures
AC9M7SP04 - 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	Create algorithms to classify shapes	Creating algorithms to classify shapes

3 Statistics and Probability

Outcome	Quests	Content
AC9M7ST01 - 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	Use the language of statistics	Using the language of statistics
	Measures of centre	Calculating the mean, median, mode
	Measure of spread	Calculating range
	Analyse data using statistics	Analysing data using statistics
AC9M7ST02 - 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	Represent numerical data	Tallies & frequency tables
		Frequency histograms & polygons: grouped data
		Dot plots
		Ordered stem-and-leaf plots
		Divided bar graphs
		Pie charts
		Line graphs
		Interpreting a variety of different graphs
	Shape, centre & spread	Describing shape, centre & spread
	Clusters, gaps & outliers in data	Clusters, gaps & outliers in data
AC9M7ST03 - 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	Conduct an investigation	Conducting an investigation
	Write conclusions	Writing conclusions
AC9M7P01 - Identify the sample space for single-stage events; assign probabilities to the outcomes of these events and predict relative frequencies for related events	Identify sample space	Identifying sample space
	Language of probability	Using the language of probability
	Assign probabilities	Assigning probabilities
	Equally likely events	Determining equally likely events
	Calculate probabilities	Calculating probabilities
		Chance experiments
AC9M7P02 - 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	Experimental & theoretical probabilities	Using experimental & theoretical probabilities

Year 7 – Activities

1 Number and Algebra

Outcome	Topic	Activity Title
AC9M7N01 - 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	N- Number properties	Square Roots
AC9M7N02 - represent natural numbers as products of powers of prime numbers using exponent notation		Square Roots 1
AC9M7N03 - represent natural numbers in expanded notation using place value and powers of 10		Estimating Square Roots
		Product of Prime Factors
		Prime Factorisation with Indices
		Prime Factorisation with Indices
		Expanded Notation
AC9M7N04 - find equivalent representations of rational numbers and represent rational numbers on a number line	N- Equivalent representations	Equivalent Fraction Wall 2
		Equivalent Fractions on a Number Line 2
		Simplifying Fractions
		Converting Mixed and Improper
		Fractions to Decimals 2
		Decimals to Fractions 2
		Fraction to Terminating Decimal
		Percentages to Fractions (with and without simplification)
		Percentages greater than 100% to Mixed Numerals
		Fractions to Percentages (Non-Calculator)
		Mixed Numerals to Percentages greater than 100%
		Percentages to Decimals
		Decimals to Percentages
		Match Decimals and Percentages
		Mixed decimal, percentage and fraction conversions
AC9M7N05 - round decimals to a given accuracy appropriate to the context and use appropriate	N- Rounding decimals	Rounding Decimals
		Rounding Decimals 2
		Rounding Numbers for Division/Compatible Numbers

		Estimate Differences
rounding and estimation to check the reasonableness of solutions	10	Estimate Decimal Differences 1
		Estimate Decimal Sums 1
		Estimate Decimal Differences 2
		Estimate Decimal Sums 2
		Estimate Decimal Operations
AC9M7N06 - use the 4 operations with positive rational numbers including fractions, decimals and percentages to solve problems using efficient calculation strategies	N- Operations of FDP	Add: No Common Denominator
		Add Unlike Mixed Numbers
		Subtract: No Common Denominator
		Subtract Unlike Mixed Numbers
		Add Mixed Numbers: Same Sign
		Add Mixed Numbers: Signs Differ
		Subtract Mixed Numbers: Renaming
		Multiply Two Fractions 2
		Divide Fractions by Fractions 2
		Fraction of an Amount
		More Fraction Problems
		Adding and Subtracting Decimals
		Decimal by Whole Number
		Decimal by Decimal
		Percentage of a Quantity
		Percentage Change: Increase and Decrease
		Percentages of a quantity (>100%)
AC9M7N07 - compare, order and solve problems involving addition and subtraction of integers	N- Integers	Ordering Integers (Number Line)
		Comparing Integers
		Integers: Add and Subtract
		Subtract Integers
		Integers: Subtraction
		More with Integers
AC9M7N08 - recognise, represent and solve problems involving ratios	N- Ratio problems	Simplify Ratios: 2 Whole Numbers
		Simplify Ratios: 3 Whole Numbers
		Simplify Ratios: Decimals
		Simplify Ratios: Fractions
		Simplify Ratios: Mixed Numbers
		Dividing a Quantity in a Ratio
AC9M7N09 - use mathematical modelling to solve practical problems involving rational numbers and percentages,	N-Number Applications	Percentage of an amount using fractions (<100%)
		Quantities to Percentages (no units)

		Quantities to Percentages (with units)
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	11	Percentage Composition
		Percentage Word Problems
AC9M7A01 - recognise and use variables to represent everyday formulas algebraically and substitute values into formulas to determine an unknown	A-Substitution	Simple Substitution
		Simple Substitution 2
		Simple Substitution 3
		Complex Substitution
		Substitution in Formulae
		More Substitution in Formulae
		Real Formulae
AC9M7A02 - formulate algebraic expressions using constants, variables, operations and brackets	A-Algebraic expressions	Writing Algebraic Expressions
		Recognising Like Terms
		Like Terms: Add and Subtract
		Algebraic Multiplication
		Dividing Expressions
		Algebraic Division
		Surd Form to Index Form
AC9M7A03 - solve one-variable linear equations with natural number solutions; verify the solution by substitution	A-Solving equations	Solve Equations: Add, Subtract 1
		Solve Equations: Add, Subtract 2
		Solve Equations: Multiply, Divide 1
		Solve Equations: Multiply, Divide 2
		Solving Simple Equations
		Solve Two-Step Equations
		Equations with Fractions
		Write an Equation: Word Problems
AC9M7A04 - describe relationships between variables represented in graphs of functions from authentic data	A-Rates	Rates Word Problems
		Rates Calculations
		Average Speed
		Time Taken
		Distance Travelled
		Travel Graphs
AC9M7A05 - generate tables of values from visually growing patterns or the rule of a function; describe and plot these relationships on the Cartesian plane	A-Patterns and rules	Table of Values
		Pattern Rules and Tables
		Find the Pattern Rule
		Graphing from a Table of Values
		Reading Values from a Line
		Determining a Rule for a Line
AC9M7A06 - manipulate formulas involving several variables using digital tools, and describe the effect of systematic variation in the values of the variables	Teacher directed	

2 Measurement and Space

Outcome	Topic	Activity Title
AC9M7M01 - solve problems involving the area of triangles and parallelograms using established formulas and appropriate units	M- Perimeter, Area & Volume	Area: Triangles
AC9M7M02 - solve problems involving the volume of right prisms including rectangular and triangular prisms, using established formulas and appropriate units		Area: Right Angled Triangles
AC9M7M03 - describe the relationship between π and the features of circles including the circumference, radius and diameter		Area: Parallelograms (Metric)
		Volume: Rectangular Prisms 1
		Volume: Rectangular Prisms 2
		Labelling Circles
		Circle Terms
		Calculate circumference of circles
AC9M7M04 - 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	M- Geometry	Introduction to Angles on Parallel Lines 1
AC9M7M05 - 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		Parallel Lines
		Angles and Parallel Lines
		Are the Lines Parallel?
		Angle Sum of a Triangle
		Quadrilaterals: Angle Sum with Equations
		Interior angles
AC9M7M06 - 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		Ratio of Intercepts
AC9M7SP01 - represent objects in 2 dimensions; discuss and reason about the advantages and disadvantages of different representations	SP-Shape and Space	Nets
AC9M7SP02 - classify triangles, quadrilaterals and other polygons according to their side and angle properties; identify and reason about relationships		Triangle Tasters
		Properties of Quadrilaterals
		Plane Figure Theorems
AC9M7SP03 - describe transformations of a set of points using coordinates in the Cartesian		Rotational Symmetry
		Horizontal and Vertical Change

plane, translations and reflections on an axis, and rotations about a given point		Transformations: Coordinate Plane
	13	Rotations: Coordinate Plane
AC9M7SP04 - 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	Teacher directed	

3 Statistics and Probability

Outcome	Topic	Activity Title
AC9M7ST01 - 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	ST-Statistical data	Mode from Frequency Table
		Mode from Stem and Leaf Plot
		Median from Frequency Table
		Median from Stem and Leaf Plot
		Mean from Frequency Table
		Stem and Leaf Plots with Range
		Which Measure of Central Tendency?
AC9M7ST02 - 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	ST- Statistical displays	Reading from a Column Graph
		Line Graphs: Interpretation
		Sector Graphs
		Creating a Sector Graph
		Divided Bar Graphs
		Dot Plots
		Stem and Leaf Plots: Concept
		Bar Graphs 1
AC9M7ST03 - 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	Teacher directed	
AC9M7P01 - identify the sample space for single-stage events; assign probabilities to the outcomes of these events and predict relative frequencies for related events	P-Probability	What are the Chances?
		Find the Probability
		Simple Probability
		Relative Frequency
AC9M7P02 - 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	Teacher directed	

Year 8 – Skill Quests

1 Number and Algebra

Outcome	Quests	Content
AC9M8N01 - Recognise irrational numbers in applied contexts, including square roots and π	Irrational numbers	Understanding irrational numbers
		Approximating irrational numbers
AC9M8N02 - Establish and apply the exponent laws with positive integer exponents and the zero-exponent, using exponent notation with numbers	Exponent laws	Investigating index laws
		Using index laws
AC9M8N03 - Recognise terminating and recurring decimals, using digital tools as appropriate	Terminating & recurring decimals	Investigating terminating & recurring decimals
AC9M8N04 - Use the 4 operations with integers and with rational numbers, choosing and using efficient strategies and digital tools where appropriate	Integers	Adding & subtracting integers
		Multiplying & dividing integers
		4 operations of integers
AC9M8N05 - 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	Percentages in financial context	Increasing & decreasing amounts
		Solving problems involving percentages
		Calculations with discounts
		Simple interest
		Hire purchase agreements
		GST: Goods and Services Tax
AC9M8A01 - Create, expand, factorise, rearrange and simplify linear expressions, applying the associative, commutative, identity, distributive and inverse properties	Simplify algebraic expressions	Simplifying algebraic expressions
	Expand algebraic expressions	Expanding basic algebraic expressions
	Factorise algebraic expressions	Factorising algebraic expressions
AC9M8A02 - 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	Solve linear equations	Solving equations with variables on both sides
		Solving equations involving brackets
		Solving linear equations graphically
	Graph linear equations	Vertical & horizontal lines
		Finding & using x- & y-intercepts

		Graphing using the gradient-intercept method
	Linear inequalities	Understanding inequalities
		Solving linear inequalities: 1 step
		Solving linear inequalities: 2 step
		Graphing inequalities
AC9M8A03 - 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	Linear equations in context	Modelling linear equations in context
AC9M8A04 - Experiment with linear functions and relations using digital tools, making and testing conjectures and generalising emerging patterns	Compare linear graphs	Comparing linear graphs

2 Measurement and Shape

Outcome	Quests	Content
AC9M8M01 - Solve problems involving the area and perimeter of irregular and composite shapes using appropriate units	Perimeter: composite shapes	Calculating perimeter: composite shapes
	Area: composite shapes	Calculating area: composite shapes
		Calculating area: dissections
	Convert units of area	Converting units of area
AC9M8M02 - Solve problems involving the volume and capacity of right prisms using appropriate units	Volume of prisms	Developing volume formulas
		Calculating dimensions from volume
	Solve volume problems	Solving problems involving prisms
	Units of volume/capacity	Choosing & converting units of volume
AC9M8M03 - Solve problems involving the circumference and area of a circle using formulas and appropriate units	Solve problems with circumference	Calculating perimeter: parts of circles
		Calculating arc lengths & perimeters of sectors
	Area of circles	Solving area problems involving circles
		Solving area problems involving parts of circles
		Calculating area: composite shapes with circles
AC9M8M04 - Solve problems involving duration, including using 12- and 24-hour time across multiple time zones	Solve problems involving time	Time elapsed
		Rounding & converting time
		Solving problems with time zones
AC9M8M05 - Recognise and use rates to solve problems involving the comparison of 2 related quantities of different units of measure	Use rates to solve problems	Understanding rates
		Comparing rates
		Rates in context
AC9M8M06 - Use Pythagoras' theorem to solve problems involving the side lengths of right-angled triangles	Pythagoras' theorem	Identifying sides on right-angled triangles
		Calculating the hypotenuse
		Calculating a shorter side
		Calculating a shorter side or hypotenuse
		Solving problems involving Pythagoras' theorem
		Exploring Pythagorean triads
		Using the converse of Pythagoras' theorem
		Pythagoras' theorem: using exact values
AC9M8M07 - Use mathematical modelling to solve practical problems involving ratios and rates, including financial contexts;	Solve problems involving ratios	Solving problems involving ratios
		Ratios involving more than two parts

		Converting ratios
formulate problems; interpret and communicate solutions in terms of the situation, reviewing the appropriateness of the model	18	
AC9M8SP01 - 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	Define & work with congruence	Defining & working with congruence
	Determine congruence in triangles	Determining congruence in triangles
	Similar triangles	Introducing similarity
		Similar triangles
AC9M8SP02 - Establish properties of quadrilaterals using congruent triangles and angle properties, and solve related problems explaining reasoning	Use properties of congruent triangles	Using properties of congruent triangles
	Solve problems involving quadrilaterals	Solving problems involving quadrilaterals
AC9M8SP03 - 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	Teacher directed	
AC9M8SP04 - 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	Create algorithms for congruent shapes	Creating algorithms for congruent shapes

3 Statistics and Probability

Outcome	Quests	Content
AC9M8ST01 - Investigate techniques for data collection including census, sampling, experiment and observation, and explain the practicalities and implications of obtaining data through these techniques	Collect data	Collecting data
AC9M8ST02 - 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	Data sampling & populations	Exploring data sampling
AC9M8ST03 - 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	Teacher directed	
AC9M8ST04 - 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	Teacher directed	
AC9M8P01 - Recognise that complementary events have a combined probability of one; use this relationship to calculate probabilities in applied contexts	Complementary events	Complementary events
AC9M8P02 - 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	Language of probability	Language of probability to describe events
	Tree diagrams	Using tree diagrams
	Venn diagrams and two-way tables	Understanding & constructing Venn diagrams
		Using Venn diagrams to solve problems
		Interpreting & constructing two-way tables
		Two-way tables & Venn diagrams
AC9M8P03 - Conduct repeated chance experiments and simulations, using digital tools to determine probabilities for compound events, and describe results	Chance events	Repeated chance events

Year 8 – Activities

1 Number and Algebra

Outcome	Topic	Activity Title
AC9M8N01 - recognise irrational numbers in applied contexts, including square roots and π	N- Number properties	Irrational Numbers
AC9M8N02 - establish and apply the exponent laws with positive integer exponents and the zero-exponent, using exponent notation with numbers		Index Form to Numbers
AC9M8N03 - recognise terminating and recurring decimals, using digital tools as appropriate		Index Notation
		Properties of Exponents
		Simplifying with Index Laws 1
		The Zero Index
		Recurring Decimals
		Recurring Decimals and Series
AC9M8N04 - use the 4 operations with integers and with rational numbers, choosing and using efficient strategies and digital tools where appropriate	N-Integers	Adding Integers: Positive, Negative or Zero
		Integers: Multiply and Divide
		Integers: Order of Operations (BEDMAS)
		Multiplying and Dividing Integers
		Powers of Integers
AC9M8N05 - 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	N- Number applications & operations	Percentage of an amount using Decimals (calculator)
		Percent Increase and Decrease
		Solve Percent Equations
		GST
		Profit and Loss
		Rates
		Ratio Word Problems
AC9M8M05 - recognise and use rates to solve problems involving the comparison of 2 related quantities of different units of measure		
AC9M8M07 – 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		
AC9M8A01 - create, expand, factorise, rearrange and simplify linear expressions, applying the associative, commutative, identity, distributive and inverse properties	A-Algebraic expressions	Expanding Brackets
		Expand then Simplify
		Expanding with Negatives
		Factorising Expressions
		Factorising with Negatives
AC9M8A02 - 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	A-Linear equations & inequalities	Which Straight Line?
AC9M8A03 - 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		Identifying Graphs
		Intercepts
		Equation of a Line 1
		General Form of a Line
		Horizontal and Vertical Lines
		Equation from Point and Gradient
		Direct Linear Variation/y=ax
		Modelling Linear Relationships
		Linear Modelling
		Breakeven Point
AC9M8A04 - experiment with linear functions and relations using digital tools, making and testing conjectures and generalising emerging patterns	Teacher directed	

2 Measurement and Shape

Outcome	Topic	Activity Title
AC9M8M01 - solve problems involving the area and perimeter of irregular and composite shapes using appropriate units	M- Perimeter, Area & Volume	Perimeter: Composite Shapes
AC9M8M02 - solve problems involving the volume and capacity of right prisms using appropriate units		Area: Composite Shapes
AC9M8M03 - solve problems involving the circumference and area of a circle using formulas and appropriate units		Capacity Word Problems
		Volume of Triangular Prisms
		Volume: Prisms
		Arc Length
		Perimeter and Circles
		Area: Circles 1
		Area: Sectors (Degrees)
		Area: Annulus
AC9M8M04 - solve problems involving duration, including using 12- and 24-hour time across multiple time zones	M-Time	Elapsed Time
		What Time Will it Be?
		Using Timetables
		Australian Time Zones
		Time Zones
		Time Differences
AC9M8M05 - recognise and use rates to solve problems involving the comparison of 2 related quantities of different units of measure	Teacher directed	
AC9M8M06 - use Pythagoras' theorem to solve problems involving the side lengths of right-angled triangles	M-Pythagoras theorem	Pythagorean Triads
		Hypotenuse of a Right Triangle
		Pythagoras' theorem
		Pythagorean theorem
		Pythagoras and Perimeter
		Pythagoras: Find a Short Side (integers only)
		Pythagoras: Find a short side (rounding needed)
		Pythagoras: Find a Short Side (decimal values)
AC9M8M07 - 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	Teacher directed	
AC9M8SP01 - identify the conditions for congruence and	SP-Shapes and angles	Congruent Triangles

similarity of triangles and explain the conditions for other sets of common shapes to be congruent or similar, including those formed by transformations	23	
AC9M8SP02 - establish properties of quadrilaterals using congruent triangles and angle properties, and solve related problems explaining reasoning		Similar Triangles
		Similarity Proofs
		Exterior Angles of a Triangle
AC9M8SP03 - 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	SP-Position and transformation	True and Compass Bearings
		Latitude and Longitude
AC9M8SP04 - 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	Teacher directed	

3 Statistics and Probability

Outcome	Topic	Activity Title
AC9M8ST01 - investigate techniques for data collection including census, sampling, experiment and observation, and explain the practicalities and implications of obtaining data through these techniques	Teacher directed	
AC9M8ST02 - 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	ST- Statistical investigations	Methods of Data Sampling Data sampling
AC9M8ST03 - 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	Teacher directed	
AC9M8ST04 - 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	Teacher directed	
AC9M8P01 - recognise that complementary events have a combined probability of one; use this relationship to calculate probabilities in applied contexts	P-Probability	Complementary Events Dice and Coins Venn Diagram 1 Venn Diagrams Probability Tables Tree Diagrams
AC9M8P02 - 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	Teacher directed	
AC9M8P03 - conduct repeated chance experiments and simulations, using digital tools to determine probabilities for compound events, and describe results	Teacher directed	

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