

Mathletics

NSW Curriculum –AC Aligned v9 2022

Skill Quests



Stage 4
August, 2023

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Contents

Stage 4.....	3
1 Number and Algebra	3
2 Measurement and Space	9
3 Statistics and Probability	12

Stage 4

1 Number and Algebra

Computation with integers: MA4-INT-C-01 Compares, orders and calculates with integers to solve problems	
Skill Quests	Skills
Computation with integers	Comparing & ordering integers
	Adding & subtracting integers with models
	Adding & subtracting integers without models
	Multiplying & dividing integers
	Applying the 4 operations to integers
Course Topic	Activities Title
Integers	Comparing Integers
	Ordering Integers (Number Line)
	Adding Integers: Positive, Negative or Zero
	Add Integers
	Negative or Positive?
	Integers: Subtraction
	Integers: Add and Subtract
	More with Integers
	Multiplying and Dividing Integers
	Integers: Multiply and Divide
	Integers: Order of Operations (BEDMAS)

Fractions, decimals and percentages: MA4-FRC-C-01 Represent and operates with fractions, decimals and percentages to solve problems	
Skill Quests	Skills
Compare fractions using equivalence	Determining equivalent fractions
	Simplifying fractions
	Comparing proper fractions using equivalence
	Comparing improper fractions & mixed numbers
Working with decimals	Rounding decimals
	Rounding to estimate answers
	Identifying terminating & recurring decimals
Fractions, decimals & percentages	Converting fractions to decimals
	Converting decimals to fractions
	Converting fractions to percentages
	Converting percentages to fractions
	Converting decimals to percentages
	Converting percentages to decimals
	Converting improper fractions & mixed numbers
	Comparing fractions, decimals & percentages
Examine the concept of irrational number	Identifying & defining irrational numbers
Add & subtract fractions	Adding fractions with the same denominator

	Adding fractions with different denominators
	Subtracting fractions with the same denominator
	Subtracting fractions with different denominators
	Subtracting a fraction from a whole
	Adding & subtracting fractions in different forms
Multiply & divide fractions	Multiplying a fraction by a whole
	Multiply improper fraction/mixed number by a whole
	Multiplying 2 proper fractions
	Multiplying 2 improper fractions or mixed numbers
	Dividing a fraction or mixed number by a whole
	Dividing a whole by a fraction or mixed number
	Dividing 2 fractions
	Dividing fractions & mixed numbers
Multiply & divide decimals	Multiplying decimals
	Understanding the effect of dividing by a decimal
	Dividing decimals
One quantity as proportion of another	Express quantities as fractions or percentages
Solve problems that involve percentages	Calculating a percentage of an amount
	Increasing & decreasing amounts by a percentage
	Solving percentage problems
	Calculating GST
	Calculating discounts
	Solving problems involving profit & loss
Course Topic	Activities Title
Equivalence and conversion between FDP	Simplifying Fractions
	Identifying Fractions Beyond 1
	Converting Mixed and Improper
	Fractions to Decimals 2
	Fraction to Terminating Decimal
	Decimals to Fractions 2
	Recurring Decimals
	Recurring Decimals and Series
	Fractions to Percentages (Non-Calculator)
	Fractions to Percentages (Calculator)
	Mixed Numerals to Percentages greater than 100%
	Percentages to Fractions (with and without simplification)
	Percentages greater than 100% to Mixed Numerals
	Decimals to Percentages
	Percentages to Decimals
	Mixed decimal, percentage and fraction conversions
Comparing and ordering FDP	Uneven partitioned shapes 1
	Uneven partitioned shapes 2
	Identifying Fractions on a Number Line
	Mixed and Improper Fractions on a Number Line
	Ordering Fractions 1
Rounding and estimating decimals	Rounding Decimals
	Rounding Decimals 2
	Rounding Numbers for Division/Compatible Numbers
	Estimate Decimal Sums 1
	Estimate Decimal Differences 1
	Estimate Decimal Sums 2
	Estimate Decimal Differences 2

	Estimate Decimal Operations
	Irrational Numbers
Operations with fractions	Add: No Common Denominator
	Mixed Numerals
	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
	Multiplying Fractions
	Multiply Fraction by Whole Number
	Multiply Mixed Numbers
	Dividing Fractions
	Divide Mixed Numbers
	Fraction of an Amount
	Fraction Word Problems
	More Fraction Problems
Operations with decimals	Missing Values: Decimals
	Adding and Subtracting Decimals
	Multiply Decimals 1
	Decimal by Whole Number
	Decimal by Decimal
	Multiply Decimals: Area Model
	Divide Decimal by Whole Number
	Divide Decimals by Powers of 10 100 1000
	Money Problems: Four Operations
	Divide Decimal by Decimal
Operations with percentages	Percentage of a Quantity
	Percentage of an amount using Fractions (<100%)
	Percentage of an amount using Decimals (calculator)
	Quantities to Percentages (no units)
	Quantities to Percentages (with units)
	Percentage Composition/What percentage?
	Percentage Change: Increase and Decrease
	Percentages of a quantity (>100%)
	Percent Increase and Decrease
	Solve Percent Equations
	Percentage Word Problems
	GST
	Profit and Loss

Ratios and rates: MA4-RAT-C-01 Solves problems involving ratios and rates, and analyses distance-time graphs	
Skill Quests	Skills
Ratios & rates	Introducing ratios
	Simplifying ratios
	Using the unitary method for ratio problems
	Dividing a quantity by a ratio
	Recognising & simplifying rates
	Solving problems involving rates
	Interpreting distance-time graphs

	Making calculations from distance-time graphs
	Constructing distance-time graphs
Course Topic	Activities Title
Ratios problems	Simplify Ratios: 2 Whole Numbers
	Simplify Ratios: 3 Whole Numbers
	Simplify Ratios: Decimals
	Simplify Ratios: Fractions
	Simplify Ratios: Mixed Numbers
	Ratios
	Dividing a Quantity in a Ratio
	Ratio Word Problems
	Scale Measurement
Rates problems	Unitary Method
	Rates Calculations
	Converting Rates
	Rates Word Problems
	Best Buy
	Average Speed
	Time Taken
	Distance Travelled
	Travel Graphs

Algebraic techniques: MA4-ALG-C-01	
Generalises number properties to operate with algebraic expressions including expansion and factorisation	
Skill Quests	Skills
Algebraic techniques	Examining the concept of pronumerals
	Equivalent expressions
	Using patterns to create expressions
	Creating algebraic expressions
	Evaluating expressions using substitution
	Adding & subtracting to simplify expressions
	Multiplying & dividing to simplify expressions
Algebraic operations	Using 4 operations to simplify expressions
	Using the distributive law to expand
	Expanding algebraic expressions
	Factorising algebraic expressions (with scaffold)
	Factorising algebraic expressions (no scaffold)
Course Topic	Activities Title
Algebraic expressions	Writing Algebraic Expressions
	Like Terms: Add and Subtract
	Algebraic Multiplication
	Algebraic Division
	Dividing Expressions
	Expanding Brackets
	Expand then Simplify
	Expanding with Negatives
	Factorising Expressions
	Factorising with Negatives
Algebraic substitutions	Simple Substitution
	Complex Substitution

	Substitution in Formulae
	More Substitution in Formulae
	Real Formulae

Indices: MA4-IND-C-01 Operates with primes and roots, positive-integer and zero indices involving numerical bases and establishes the relevant index laws	
Skill Quests	Skills
Apply index notation	Describing & using index notation
	Evaluating numbers with indices
	Applying divisibility tests
	Representing numbers as a product of prime factors
Examine square & cube roots	Investigating square roots & cube roots
	Calculating the square root of perfect squares
	Estimating the square root of non-perfect squares
	Calculating the cube root of perfect cubes
	Estimating the cube root of non-perfect cubes
	Apply order of operations to evaluate expressions
Use index notation to find index laws	Index law for multiplication
	Index law for division
	Index law for a power of a power
	Zero index law
	Using index laws to simplify with numerical bases
Course Topic	Activities Title
Prime factorisation	Index Notation
	Index Form to Numbers
	Tests of Divisibility 1
	Product of Prime Factors
	Prime factorisation with Indices
Cube roots and square roots	Square Roots
	Square and Cube Roots
	Estimating Square Roots
	Estimating Cube Roots
	Order of Operations 2
Index laws	Properties of Exponents
	Simplifying with Index Laws 1
	The Zero Index

Equations: MA4-EQU-C-01 Solves linear equations of up to 2 steps and quadratic equations of the form $ax^2=c$	
Skill Quests	Skills
Solve linear equations up to 2 steps	Understanding algebraic language
	Writing number sentences
	Solving 1 step equations (with models)
	Solving 1 step equations (integer solutions)
	Solving 1 step equations (non-integer solutions)
	Mixed operations to solve 1 step equations
	Solving 2 step equations (integer solutions)
	Solving 2 step equations (non-integer solutions)
	Equations with brackets & variable on both sides
	Verifying equations by substitution

	Solving quadratic equations
Course Topic	Activities Title
Solving linear equations	Writing Equations
	Solve Equations: Add, Subtract 1
	Solve Equations: Add, Subtract 2
	Solve Equations: Multiply, Divide 1
	Solve Equations: Multiply, Divide 2
	Solve Two-Step Equations
	Equations with Fractions
	Solving More Equations
	Write an Equation: Word Problems
	Checking Solutions
Solving quadratic equations	Simple Quadratic Equations - How Many Solutions?
	Equations: Simple quadratics

Linear relationships: MA4-LIN-C-01 Creates and displays number patterns and finds graphical solutions to problems involving linear relationships	
Skill Quests	Skills
Linear relationships	Identifying points on the Cartesian plane
	Plotting linear relationships
	Solving linear equations with graphical techniques
Course Topic	Activities Title
Linear relationships	Ordered Pairs
	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
	Solve Systems by Graphing
	Linear Modelling
	Breakeven Point

2 Measurement and Space

Length: MA4-LEN-C-01 Applies knowledge of the perimeter of plane shapes and the circumference of circles to solve problems	
Skill Quests	Skills
Solve problems involving perimeter	Calculating perimeter of quadrilaterals
	Calculating perimeter of composite shapes
Describe & use features of circles	Describing the features of circles
	Circumference of circles & semicircles
	Calculating arc lengths & perimeter of sectors
Course Topic	Activities Title
Length and perimeter	Perimeter: Squares and Rectangles
	Perimeter: Triangles
	Perimeter Detectives 2
	Perimeter: Composite Shapes
Circumference and arc length	Labelling Circles
	Identify Parts of Circles 1
	Circle Terms
	Calculate circumference of circles
	Arc Length
	Perimeter and Circles

Right-angled triangles (Pythagoras' theorem): MA4-PYT-C-01 Applies Pythagoras' theorem to solve problems in various contexts	
Skill Quests	Skills
Right-angled triangles (Pythagoras)	Identifying & defining Pythagoras' theorem
	Applying Pythagoras' theorem to find hypotenuse
	Applying Pythagoras' theorem to find shorter sides
	Applying Pythagoras' theorem to find any lengths
	Applying the converse of Pythagoras' theorem
Solve problems using Pythagoras' theorem	Solving problems using Pythagoras' theorem
	Pythagorean Triads
Course Topic	Activities Title
Pythagoras's theorem	Pythagoras' Theorem
	Hypotenuse of a Right Triangle
	Pythagoras: Find a Short Side (integers only)
	Pythagoras: Find a short side (rounding needed)
	Pythagoras: Find a Short Side (decimal values)
	Pythagorean Triads
	Pythagoras and Perimeter

Area: MA4-ARE-C-01 Applies knowledge of area and composite area involving triangles, quadrilaterals and circles to solve problems	
Skill Quests	Skills
Calculate area using a formula	Calculating area of rectangles
	Calculating area of triangles
	Calculating area of parallelograms

Calculate area of circles & sectors	Calculating area of circles
	Calculating area of sectors
Area of composite & other shapes	Calculating area of composite shapes
	Calculating area of trapeziums
	Calculating area of rhombuses
	Calculating area of kites
Choose & convert between units of area	Choosing & converting between units of area
Course Topic	Activities Title
Area of shapes	Converting Units of Area
	Area: Squares and Rectangles
	Area: Triangles
	Area: Parallelograms (Metric)
	Area: Quadrilaterals
	Area: Composite Shapes
	Area: Circles 1
	Area: Sectors (Degrees)
	Area: Annulus

Volume: MA4-VOL-C-01 Applies knowledge of volume and capacity to solve problems involving right prisms and cylinders	
Skill Quests	Skills
Describe different views of prisms	Describing different views of prisms
	Identify & sketch prisms from their cross-section
Formula for volume of prisms	Calculating volume of cubes
	Calculating volume of rectangular prisms
	Finding dimensions/area, given the volume of prism
	Calculating volume of a triangular prism
	Find dimensions, given volume of triangular prism
	Calculating volume of a composite polygon
Formula for volume of cylinders	Calculating volume of a cylinder
	Finding dimensions, given volume of cylinder
	Solving problems involving prisms & cylinders
Convert between units of capacity/volume	Converting between units of capacity/volume
Course Topic	Activities Title
Volume of prism and cylinder	Nets
	Volume: Rectangular Prisms 2
	Volume of Triangular Prisms
	Volume: Prisms
	Volume: Cylinders
Capacity	Millilitres and Litres
	Converting Volume
	Capacity Word Problems

Angle relationships: MA4-ANG-C-01 Applies angle relationships to solve problems, including those related to transversals on sets of parallel lines	
Skill Quests	Skills
Apply language & conventions of geometry	Using language & conventions of geometry
Solve angle problems using reasoning	Right, straight, vertically opposite & at a point
	Complementary & supplementary angles
	Perpendicular & parallel lines
	Geometric reasoning with angles on parallel lines
	Solving angle problems using reasoning
Course Topic	Activities Title
Angle relationships	Labelling Angles
	Equal, Complementary or Supplementary Angles
	Angles of revolution: Value of x
	Vertically Opposite Angles: Value of x
	What pair of lines am I?
	Introduction to Angles on Parallel Lines 1
	Parallel Lines
	Angles and Parallel Lines
	Are the Lines Parallel?

Properties of geometrical figures: MA4-GEO-C-01 Identifies and applies the properties of triangles and quadrilaterals to solve problems	
Skill Quests	Skills
Properties of geometrical figures	Classifying triangles & describe properties
	Classifying quadrilaterals
	Classifying trapeziums & kites
	Reasoning about special quadrilaterals
	Convex & non-convex quadrilaterals
	Interior & exterior angles of a triangle
	Interior angles of a quadrilateral
Course Topic	Activities Title
Triangle and quadrilateral properties	Triangles: Acute, Right, Obtuse
	Triangle Tasters
	Angle Sum of a Triangle
	Exterior Angles of a Triangle
	Properties of Quadrilaterals
	Plane Figure Theorems
	Quadrilaterals: Angle Sum with Equations
	Interior angles

3 Statistics and Probability

Data classification and visualisation: MA4-DAT-C-01 Classifies and displays data using a variety of graphical representations	
Skill Quests	Skills
Classify & display data	Numerical data(discrete/continuous) or categorical
	Using tallies & frequency tables
	Constructing stem & leaf plots
	Constructing discrete data displays
	Constructing continuous data displays
	Constructing divided bar graphs
	Constructing sector graphs
	Constructing line graphs
Interpret data in graphs	Interpreting discrete data in graphs
	Interpreting data in a variety of graphs
	Calculating statistical measures
	Comparing statistical measures to draw conclusions
	Drawing conclusions based on analysis
	Misleading graphical displays
Course Topic	Activities Title
Classifying and displaying data	Data Terms
	Data Types
	Frequency Histograms
	Dot Plots
	Stem and Leaf Plots: Concept
	Divided Bar Graphs
	Sector Graphs
	Picture Graphs: with scale & half symbols
Interpreting Data	Interpreting Tables
	Reading from a Column Graph
	Line Graphs: Interpretation
	Sector Graph Calculations
	Creating a Sector Graph

Data analysis: MA4-DAT-C-02 Analyses simple datasets using measures of centre, range and shape of data	
Skill Quests	Skills
Data analysis	Understanding the language of statistics
	Calculating & comparing mean, median & mode
	Calculating & comparing the range
	Interpreting the effect of unusual features
	Describing shape
	Analysing datasets & draw conclusions
	Understanding census & sampling
	Recognising variations in samples
Course Topic	Activities Title
Mean, median, mode and range	Mean
	Median
	Data Extremes and Range
	Mean from Frequency Table

	Median from Frequency Table
	Mode from Frequency Table
	Median from Stem and Leaf Plot
	Mode from Stem and Leaf Plot
	Stem and Leaf Plots with Range
Data analysis	Skewness of Data
	Which Measure of Central Tendency?
Sampling	Methods of Data Sampling
	Data sampling

Probability: MA4-PRO-C-01 Solves problems involving the probabilities of simple chance experiments	
Skill Quests	Skills
Determine probabilities	Understanding the language around chance
	Listing the sample space of events
	Using associated language with probabilities
	Equally likely outcomes
	Describing theoretical probabilities
	Expressing probabilities in different forms
	Comparing experimental & theoretical probability
	Calculating expected probability
Probabilities for complementary events	Determining probabilities for complementary events
Course Topic	Activities Title
Chance experiments	Probability Scale
	Find the Probability
	Simple Probability
	Relative Frequency
	Dice and Coins
Complementary events	Complementary events
Tables and diagrams	Probability Tables
	Venn Diagram 1
	Venn Diagrams
	Tree Diagrams



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