

# Mathletics

## NWEA Australian Curriculum (RIT bands)

### Understanding Practice and Fluency (UPF)



## Number and Algebra

November, 2021

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Number and Algebra

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# 189–200

## 1. Number and place value

Outcome	Quests	Content
ACMNA051 Investigate the conditions required for a number to be odd or even and identify odd and even numbers	Odd and even numbers	Identifying odd and even numbers
ACMNA052 Recognise, model, represent and order numbers to at least 10 000	Numbers to 10 000	Identifying and counting numbers up to 4 digits
		Reading and representing numbers up to 4 digits
		Comparing and ordering numbers to 10 000
ACMNA053 Apply place value to partition, rearrange and regroup numbers to at least 10 000 to assist calculations and solve problems	Place value and partitioning	Place value up to 4-digits
		Rounding numbers: 4 digits
ACMNA054 Recognise and explain the connection between addition and subtraction	Addition and subtraction	Relationship between addition and subtraction
ACMNA055 Recall addition facts for single-digit numbers and related subtraction facts to develop increasingly efficient mental strategies for computation	Addition/subtraction facts & strategies	Add/subtract: 2 and 3 numbers within 1000
		Add/subtract: 2- & 3-digit using jump strategy
		Add/subtract: 2- & 3-digit using place value
		Add/subtract: 2- & 3-digit using bridging to 10
		Add/Subtract: Bridging with unknowns
		Add/subtract: 3-digits using partitioning
		Add/subtract: 3-digits using place value
		Add/subtract: 2- & 3-digit using split strategy
		Add/subtract: rounding & compensation
		Add/subtract: to and from 100
		Add/subtract: multiples of 100, 1000 & 10000
		Add/Subtract: using non-standard partitioning
		Add/Subtract: Choosing efficient strategies
		Add/Subtract: Estimating
ACMNA056 Recall multiplication facts of two, three, five and ten and related division facts	Skip counting	Skip counting by 10 to 1000
		Skip counting by 2 to 1000
		Skip counting by 5 to 1000

	Multiplication & division facts	Skip counting by 3 to 1000
		Skip counting by 4 to 40
		Multiplication/Division facts for 2
		Multiplication/Division facts for 10
		Multiplication/Division facts for 5
		Multiplication/Division facts for 2, 5, 10
ACMNA057 Represent and solve problems involving multiplication using efficient mental and written strategies and appropriate digital technologies	Multiplication word problems	Multiplication/Division facts for 3
		Writing & solving multiplication word problems
		Word problems and missing numbers

## 2. Fractions and decimals

Outcome	Quests	Content
ACMNA058 Model and represent unit fractions including $\frac{1}{2}$ , $\frac{1}{4}$ , $\frac{1}{3}$ , $\frac{1}{5}$ and their multiples to a complete whole	Fractions	Using fractions: halves, quarters & eighths
		Numerator and denominator
		Using fractions: halves, thirds & quarters
		Using fractions: thirds & sixths
		Using fractions: fifths

## 3. Money and financial mathematics

Outcome	Quests	Content
ACMNA059 Represent money values in multiple ways and count the change required for simple transactions to the nearest five cents	Money	Making purchases and calculating change

## 4. Patterns and algebra

Outcome	Quests	Content
ACMNA060 Describe, continue, and create number patterns resulting from performing addition or subtraction	Number patterns	Identifying and creating number patterns

# 201–210

## 1. Number and place value

Outcome	Quests	Content
ACMNA071 Investigate and use the properties of odd and even numbers	Properties of odd and even numbers	Odd and even numbers
ACMNA072 Recognise, represent and order numbers to at least tens of thousands	Numbers up to 5 digits	Comparing/ordering numbers up to 5 digits
		Place value up to 5 digits
		Using place value to partition: up to 5 digits
		Rounding numbers: 5 digits
ACMNA073 Apply place value to partition, rearrange and regroup numbers to at least tens of thousands to assist calculations and solve problems	Addition and subtraction strategies	Representing problems using a bar model
		Add/subtract: efficient strategies
		Addition algorithms (without carrying)
		Addition algorithms (with carrying)
		Addition algorithms (with/without carrying)
		Subtraction algorithms (without decomposing)
		Subtraction algorithms (with decomposing)
		Add/subtract: word problems
ACMNA074 Investigate number sequences involving multiples of 3, 4, 6, 7, 8, and 9	Investigating sequences with multiples	Investigating sequences with multiples
ACMNA075 Recall multiplication facts up to $10 \times 10$ and related division facts	Multiplication and division facts	Multiplication/division facts for 4
		Multiplication/division facts up to 5
		Multiplication/division facts and properties
		Exploring multiplication/division for 6 up to 60
		Exploring multiplication/division for 7 up to 70
		Exploring multiplication/division for 8 up to 80
		Exploring multiplication/division for 9 up to 90

ACMNA076 Develop efficient mental and written strategies and use appropriate digital technologies for multiplication and for division where there is no remainder	Mult and div strategies, no remainder	Multiplying 2-digit numbers by multiples of 100
		Dividing 3-digit numbers by 10
		Multiplication strategies: 1-digit numbers
		Using the conventions of multiplication
		Multiples and factors up to 100
		Inverse facts: multiplication and division
		Practising multiplication strategies
		Multiplying 2-digit numbers by a 1-digit number
		Multiplying 2-digit numbers using doubling
		Multiplying 2-digit numbers using factorising
		Selecting effective multiplication strategies
		Comparisons using the language of multiplication
		Dividing a 2-digit number by a 1-digit number

## 2. Fractions and decimals

Outcome	Quests	Content
ACMNA077 Investigate equivalent fractions used in contexts	Equivalent fractions	Investigating equivalent fractions
ACMNA078 Count by quarters halves and thirds, including with mixed numerals. Locate and represent these fractions on a number line	Counting by fractions and mixed numerals	Counting in halves and quarters
		Counting in thirds
		Mixed numerals on the number line
ACMNA079 Recognise that the place value system can be extended to tenths and hundredths. Make connections between fractions and decimal notation	Place value to hundredths	Using decimal tenths
		Using decimal hundredths
		Partitioning decimal hundredths
		Connecting fractions and decimal notation

### 3. Money and financial mathematics

Outcome	Quests	Content
ACMNA080 Solve problems involving purchases and the calculation of change to the nearest five cents with and without digital technologies	Solving money problems	Addition and subtraction money problems

### 4. Patterns and algebra

Outcome	Quests	Content
ACMNA081 Explore and describe number patterns resulting from performing multiplication	Exploring number patterns	Exploring number patterns
ACMNA082 Solve word problems by using number sentences involving multiplication or division where there is no remainder	Multiplication & division word problems	Expressing equations as word problems
		Mult/div: Solving word problems
ACMNA083 Find unknown quantities in number sentences involving addition and subtraction and identify equivalent number sentences involving addition and subtraction	Addition & subtraction number sentences	Using number sentences to find unknown quantities



# 211–217

## 1. Number and place value

Outcome	Quests	Content
ACMNA098 Identify and describe factors and multiples of whole numbers and use them to solve problems	Multiples, factors & divisibility tests	Multiples and Factors
		Divisibility Tests
ACMNA099 Use estimation and rounding to check the reasonableness of answers to calculations	Estimating and rounding	Checking with estimation and rounding
		Rounding to estimate products and quotients
ACMNA100 Solve problems involving multiplication of large numbers by one- or two-digit numbers using efficient mental, written strategies and appropriate digital technologies	Multiplication	Multiplication using multiples of 10
		Mult: rounding, compensating and partitioning
		Mult: doubling, halving and thirding
		Multiplying using the split method
		Multiplying by factorising
		Multiplying using an area model
		Multiplying using formal algorithms
		Multiplication word problems
ACMNA101 Solve problems involving division by a one digit number, including those that result in a remainder	Division	Division using partitioning
		Extended division - no remainders or zeros
		Extended division - remainders
		Extended division - with and without remainders
		Contracted division - no remainders or zeros
		Contracted division - no remainders
		Contracted division - with and without remainders
		Division word problems
ACMNA291 Use efficient mental and written strategies and apply appropriate digital technologies to solve problems	Addition and subtraction	Adding numbers of any size
		Subtracting numbers of any size
		Adding and subtracting numbers of any size

## 2. Fractions and decimals

Outcome	Quests	Content
ACMNA102 Compare and order common unit fractions and locate and represent them on a number line	Comparing/ordering common unit fractions	Compare and order common unit fractions
ACMNA103 Investigate strategies to solve problems involving addition and subtraction of fractions with the same denominator	Addition and subtraction: fractions	Adding and subtracting proper fractions
		Add & subtract fractions - common denominators
ACMNA104 Recognise that the place value system can be extended beyond hundredths	Place value to thousandths	Place value to thousandths
ACMNA105 Compare, order and represent decimals	Compare and order decimals	Compare and order decimals

## 3. Patterns and algebra

Outcome	Quests	Content
ACMNA107 Describe, continue and create patterns with fractions, decimals and whole numbers resulting from addition and subtraction	Number patterns - addition & subtraction	Number patterns - addition and subtraction
ACMNA121 Find unknown quantities in number sentences involving multiplication and division and identify equivalent number sentences involving multiplication and division	Number sentences - mult and div	Number sentences - mult and div

# 218–221

## 1. Number and place value

Outcome	Quests	Content
ACMNA122 Identify and describe properties of prime, composite, square and triangular numbers	Properties of numbers	Square and triangular numbers
		Prime and composite numbers
ACMNA123 Select and apply efficient mental and written strategies and appropriate digital technologies to solve problems involving all four operations with whole numbers	Operations with whole numbers	Addition and subtraction word problems
		Multiplying and dividing by multiples of 10
		Selecting efficient mult/div strategies
		Division problems
		Multiplication and division word problems
ACMNA124 Investigate everyday situations that use integers. Locate and represent these numbers on a number line	Integers	Investigating and interpreting integers

## 2. Fractions and decimals

Outcome	Quests	Content
ACMNA125 Compare fractions with related denominators and locate and represent them on a number line	Fractions with related denominators	Working with fractions
ACMNA126 Solve problems involving addition and subtraction of fractions with the same or related denominators	Adding and subtracting fractions	Add & subtract fractions-related denominators
		Add and subtract fractions and mixed numerals
ACMNA127 Find a simple fraction of a quantity where the result is a whole number, with and without digital technologies	Finding a fraction of a quantity	Finding a fraction of a quantity
ACMNA128 Add and subtract decimals, with and without digital technologies, and use estimation and rounding to check the reasonableness of answers	Adding and subtracting decimals	Adding decimals
		Subtracting decimals
ACMNA129 Multiply decimals by whole numbers and perform divisions by non-zero whole numbers where the results are terminating decimals, with and without digital technologies	Multiplying and dividing decimals	Multiplying decimals
		Dividing decimals

ACMNA130 Multiply and divide decimals by powers of 10	Mult/div decimals by powers of 10	Mult/div decimals by powers of 10
ACMNA131 Make connections between equivalent fractions, decimals and percentages	Fractions, decimals, and percentages	Representing fractions, decimals and percentages
		Fraction, decimal and percentage equivalence

### 3. Money and financial mathematics

Outcome	Quests	Content
ACMNA132 Investigate and calculate percentage discounts of 10%, 25% and 50% on sale items, with and without digital technologies	Calculating percentages	Calculating percentages

### 4. Patterns and algebra

Outcome	Quests	Content
ACMNA133 Continue and create sequences involving whole numbers, fractions and decimals. Describe the rule used to create the sequence	Number sequences	Continuing and creating number sequences
ACMNA134 Explore the use of brackets and order of operations to write number sentences	Order of operations	Order of operations - no grouping symbols
		Order of operations using grouping symbols

# 222–226

## 1. Number and place value

Outcome	Quests	Content
ACMNA149 Investigate index notation and represent whole numbers as products of powers of prime numbers	Indices	Introducing indices
		Divisibility, indices and factors
ACMNA150 Investigate and use square roots of perfect square numbers	Square and cube roots	Working with square roots
		Working with cube roots
		Solving problems with square and cube roots
ACMNA151 Apply the associative, commutative and distributive laws to aid mental and written computation	Laws of multiplication and division	Laws of multiplication and division
ACMNA280 Compare, order, add and subtract integers	Working with integers	Compare, order, add and subtract integers
		Solving temperature problems

## 2. Real numbers

Outcome	Quests	Content
ACMNA152 Compare fractions using equivalence. Locate and represent positive and negative fractions and mixed numbers on a number line	Expressing and comparing fractions	Fractions: improper and proper fractions
		Fractions: comparing and ordering
ACMNA153 Solve problems involving addition and subtraction of fractions, including those with unrelated denominators	Adding and subtracting fractions	Fractions: adding fractions
		Fractions: subtracting fractions
		Fractions: adding and subtracting fractions
ACMNA154 Multiply and divide fractions and decimals using efficient written strategies and digital technologies	Multiplying/dividing fractions/decimals	Multiplying decimals & finding quantities
		Multiplying fractions & finding quantities
		Dividing integers, fractions and decimals
		Dividing fractions by fractions and integers
ACMNA155 Express one quantity as a fraction of another, with and without the use of digital technologies	Expressing one quantity as a fraction	Expressing one quantity as a fraction of another
ACMNA156 Round decimals to a specified number of decimal places	Rounding decimals	Rounding decimals

ACMNA157 Connect fractions, decimals and percentages and carry out simple conversions	Fractions, decimals and percentages	Converting decimals
		Converting percentages
		Converting fractions to decimals
		Converting fractions to percentages
		Ordering fractions, decimals and percentages
ACMNA158 Find percentages of quantities and express one quantity as a percentage of another, with and without digital technologies.	Percentages of quantities	Percentages of quantities
ACMNA173 Recognise and solve problems involving simple ratios	Ratios	Using simple ratios
		Simplifying ratios
		Solve simple problems involving ratios

### 3. Money and financial mathematics

Outcome	Quests	Content
ACMNA174 Investigate and calculate 'best buys', with and without digital technologies	Best buys and discounts	Best buys and discounts

### 4. Patterns and algebra

Outcome	Quests	Content
ACMNA175 Introduce the concept of variables as a way of representing numbers using letters	Variable/equivalent algebraic expression	Variable and equivalent algebraic expressions
ACMNA176 Create algebraic expressions and evaluate them by substituting a given value for each variable	Algebraic patterns and expressions	Number patterns
		Evaluating formulae
		Creating algebraic expressions
ACMNA177 Extend and apply the laws and properties of arithmetic to algebraic terms and expressions	Simplifying algebraic expressions	Simplifying algebraic expressions

### 5. Linear and non-linear relationships

Outcome	Quests	Content
ACMNA178 Given coordinates, plot points on the Cartesian plane, and find coordinates for a given point	Using the coordinate system	Using the coordinate system

ACMNA179 Solve simple linear equations	Solving equations	Equations introduction
		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
		Solving 2-step equations: variable in denominator
ACMNA180 Investigate, interpret and analyse graphs from authentic data	Analysing graphs	Distance/time graphs
		Graphs and rates extension

# 227–228

## 1. Number and place value

Outcome	Quests	Content
ACMNA182 Use index notation with numbers to establish the index laws with positive integral indices and the zero index	Investigating index laws	Investigating index laws
ACMNA183 Carry out the four operations with rational numbers and integers, using efficient mental and written strategies and appropriate digital technologies	Applying the four operations to integers	Applying the four operations to integers

## 2. Real numbers

Outcome	Quests	Content
ACMNA184 Investigate terminating and recurring decimals	Consider terminating/recurring decimals	Investigate terminating and recurring decimals
ACMNA186 Investigate the concept of irrational numbers, including $\pi$	Irrational numbers	Investigating irrational numbers
		Exploring irrational numbers (surds)
ACMNA187 Solve problems involving the use of percentages, including percentage increases and decreases, with and without digital technologies	Working with percentages	Increasing and decreasing amounts
		Problem solving involving percentages
ACMNA188 Solve a range of problems involving rates and ratios, with and without digital technologies	Rates and ratios	Solve problems involving ratios
		Ratios involving more than two parts
		Converting ratios
		Using rates

## 3. Money and financial mathematics

Outcome	Quests	Content
ACMNA189 Solve problems involving profit and loss, with and without digital technologies	Solve profit and loss problems	Solving profit and loss problems



## 4. Patterns and algebra

Outcome	Quests	Content
ACMNA190 Extend and apply the distributive law to the expansion of algebraic expressions	Extend & apply the distributive law	Extending and applying the distributive law
ACMNA191 Factorise algebraic expressions by identifying numerical factors	Factorising algebraic expressions	Factorising algebraic expressions 1
		Factorising algebraic expressions 2
ACMNA192 Simplify algebraic expressions involving the four operations	Simplifying algebraic expressions	Simplifying algebraic expressions using mixed operations

## 5. Linear and non-linear relationships

Outcome	Quests	Content
ACMNA193 Plot linear relationships on the Cartesian plane with and without the use of digital technologies	Linear relationships	Working with linear sequences
		Table of values
ACMNA194 Solve linear equations using algebraic and graphical techniques. Verify solutions by substitution	Solving linear equations	Solving 3-step equations
		Solving equations with variable on both sides
		Solving equations involving brackets
		Solving linear equations graphically



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