SCOPE AND SEQUENCE Mathematics — Years 1 to 9 **NUMBER**

Scope and sequence identifies what should be taught and what is important for students to have opportunities to learn. It describes the knowledge that students need for ongoing learning in Mathematics. This knowledge is presented as *Concepts and facts* and *Procedures*.

- The scope and sequence:
- is provided for each year of schooling
- should be used together with the Essential Learnings
- provides additional detail in each Organiser
- informs the focus of Mathematics in assessment
- is a key document for school curriculum planning.

Prep	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9
Concepts and facts	Concepts and facts	Concepts and facts	Concepts and facts	Concepts and facts	Concepts and facts	Concepts and facts	Concepts and facts	Concepts and facts	Concepts and facts
 Familiar whole numbers Parts of a whole everyday object, e.g. slice of the cake Collections of objects Groups of objects in a collection Sharing of collections 	 Whole numbers 0 to 10 Half of objects and collections Quarter as half of half Groups of Sharing equally 	 Whole numbers to hundreds Place value: tens ones Half Quarter: part of a whole, half of half Equal parts of whole objects and equal parts of collections 	 Whole numbers to 999 Place value: hundreds Unit fractions: one half: one of two equal parts of a whole one quarter: one of four equal parts of a whole equal parts of a whole Mixed numbers (whole number and a fractional part, e.g. 3½) 	 Whole numbers to thousands Place value changes when multiplying and dividing by 10 and 100 tenths thousands Equivalent fractions easily related common fractions, e.g. half and quarter Mixed numbers 	 Whole numbers to 9999 Place value to at least hundredths Equivalent fractions easily related third and sixth, fifths, tenths Common fractions and mixed numbers involving denominators up to tenths Prime numbers (up to at least 20) have only two distinct factors Composite numbers have more than two factors 	 Whole numbers, square numbers, triangular numbers Equivalent fractions: common fractions, decimal fractions and percentages vinculum as a divisor Key percentages: 10%, 20%, 25%, 30%, 40%, 50%, 100% Rates express multiplicative relationships between unlike quantities Ratio express multiplicative relationships between like quantities Direct proportion is the 	 Positive and negative numbers (integers) Powers of 10 Equivalent fractions Percentages Rates, e.g. runs per over in cricket Ratio, e.g. one part concentrate juice to four parts water Direct proportion, e.g. 1:2 and 2:4 	 Rational numbers (integers, fractions and decimals) Irrational numbers (cannot be expressed as a fraction p/q for any integers p and q) Upper and lower estimates Index notation (whole number indices) Square roots Rates, e.g. exchange rates for the Australian dollar Ratio Proportion Whole and fractional percentage, greater than 100% 	 Decimal approximations of irrational numbers, e.g. pi Index notation (positive and negative indices) Scientific notation for very large and very small numbers, positive and negative powers of 10 Rate, ratio, proportion and percentage using integers fractions and decimals
	 Joining model for addition Take away and cover up model for subtraction Addition and subtraction of whole number totals to 10, two or more addends 	 Basic addition facts to 10 and subtraction facts as the inverse Addition and subtraction totals to 99, two or more addends, missing addends 	 Extensions of basic addition facts and subtraction facts as the inverse Addition and subtraction totals to 999, two or more addends 	 Addition and subtraction totals to 9999, two or more addends, missing addends and common fractions, e.g. ½ + ½ 	 Addition and subtraction of whole numbers to 9999, and decimal fractions to hundredths 	 Addition and subtraction of whole numbers, common fractions and decimal fractions to hundredths 	Addition and subtraction	 Addition and subtraction of rational numbers, and numbers with indices 	
	of more addentis	 Arrays, rows of Equal groups of Sharing parts equally (partition) Equal groups (quotition) 	 Multiplication facts up to 10 Related division facts using single-digit divisors as the inverse of multiplication facts 	 Multiplication facts (4s, 8s facts) Related division facts as the inverse of multiplication facts 	Multiplication and division by whole numbers up to 10	 Multiplication and simple division of whole numbers, common fractions and decimal fractions to hundredths 	 Multiplication and division 	 Multiplication and division of positive and negative rational numbers 	 Multiplication and division of rational numbers and numbers with indices
Procedures	Procedures	Procedures	Procedures	Procedures	Procedures	Procedures	Procedures	Procedures	Procedures
 Quantity: one-to-one 	Quantity: conservation of whole	 Quantity: groups using place 	 Quantity: groups using place 	 Quantity: groups using place 	 Quantity: groups using place 	 Quantity: groups using place 	 Quantity: groups using place 	 Quantity: groups using place 	 Quantity: groups using place
correspondence Position and order of numbers relative to other numbers Comparison of collections Relationship between quantities, e.g. more, less	numbers 0 to 10, subitising (seeing groups of 2 or 3 objects without counting) Position and order of numbers 0 to 10 Comparison Patterns in numbers: - calculator displays created using constant function Relationship between: - numbers, e.g. more, less, same as	 value Position and order of numbers relative to other numbers, to the nearest 5 or 10, ordinal numbers to 10 Comparison of odd and even numbers Patterns in numbers Relationship between: numbers, e.g. more, less, equal to, not equal to subtraction and addition 	 value Position and order of numbers relative to other numbers, to the nearest 5 or 10, and their extensions to 2- and 3-digit numbers Comparison of numbers using place value Patterns in numbers Relationship between: numbers, e.g. greater than, less than, equivalent to multiplication and division 	 Value Position and order of numbers relative to other numbers, to the nearest 5 or 10, and their extensions to 2-, 3- and 4-digit numbers Comparison number using place value Patterns in numbers involving common and decimal fractions Relationship between: whole numbers common and decimal fractions and mixed numbers 	 value Position and order of numbers relative to other numbers and to zero, to the nearest 5 or 10, and their extensions to 2-, 3- and 4- digit numbers Comparison of number using place value Patterns in numbers, common, and decimal fractions and mixed numbers Relationship between: multiplication facts (2s, 4s, and 8s, 3s, 6s, and 9s) place value changes when multipling and dividing by 10 and 100 whole numbers common and decimal fractions and mixed numbers 	 value Position and order of numbers relative to other numbers, and to zero, to the nearest 5 or 10 and their extensions to 2-, 3- and 4- digit numbers Comparison of different number concepts Patterns in numbers, common and decimal fractions and percentages Relationship between: numbers key percentages, common and decimal fractions and mixed numbers, e.g. equivalent fractions for 20%, ¹/₅, 0.20, and the words, one-fifth square numbers and the 	 value Position and order of numbers relative to other numbers, and to zero, to the nearest 5 or 10 and their extensions to 2-, 3- and 4-digit numbers Comparison of different number concepts Patterns in numbers, common and decimal fractions and percentages Relationship between: positive and negative integers common fraction, decimal fraction and percentage 	value Position and order of numbers relative to other numbers Patterns in rational numbers Relationships between: – squares and square roots – upper and lower estimates	 value Position and order of rational numbers relative to other numbers Patterns in rational numbers Relationships between: numbers scientific notation and other representations
 Mental strategies: student-generated, e.g. appropriate strategies different from the typical 	 Estimation Mental strategies: count on, count back in 1s, 2s, and 3s commutativity of addition (turn around), e.g. when calculating 2 + 7 start with 7 and add 2 make to 10 breaking up numbers to make them manageable, e.g. 7 add 5, break up 5, add 3, make to 10 then add 2 student-generated 	 Estimation Mental strategies: count back in 1, 2, and 3 make to 100 doubles and near doubles skip counting in 2s, 5s, 10s student-generated 	 Estimation Mental strategies: related facts, e.g. calculate 14 take 8 by recalling 8+6 equals 14 build up, build down to preferred reference point, e.g. to the nearest decade or 100 extensions of count on and count back strategies from single-digit facts to 2- and 3-digit numbers doubles (x 2), double doubles (x 4) skip counting (x 2, x 5, x 10) inverse operations student-generated 	 Estimation strategies for operations Mental strategies: inverse operations manageable numbers extensions of basic number facts, e.g. 6 + 3 = 9 extension of basic fact 600 + 300 = 900 doubles (x 2), double doubles (x 4), double double doubles (x 8) multiplying and dividing by 10 and 100 common denominators student-generated 	 Estimation strategies for operations familiar reference points, 5, 10, tens, hundreds, thousands place value strategies manageable numbers Mental strategies: inverse (backtracking) doubles (x 2), double doubles (x 4), double double doubles (x 8) build up (x 7 facts), build down (x 9 facts) halving student-generated 	 Estimation of number values Mental and written strategies: inverse (backtracking) links between common fractions, decimal fractions and percentages factors of numbers, e.g. 27 x 3 = 9 x 3 x 3 = 9 x 9 = 81 	 Estimation and rounding based on powers of 10 Mental and written strategies: rates, direct proportion inverse (backtracking) 	 Estimation: upper and lower boundaries Mental, electronic and written strategies: index laws with whole number indices rates, ratio, proportion inverse (backtracking) 	 Estimation: upper and lower boundaries Mental, electronic and written strategies: conventions of four operations index laws with positive and negative indices inverse (backtracking)

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scope and sequence Mathematics — Years 1 to 9 NUMBER

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 Concrete materials: computers manipulative materials (random placement, patterns, and in a line) Verbal: counting (forward to 10, backward in 1s from 5, next number in the chant of the counting sequence, e.g. 1,2,3,4,?) more, less everyday language: slice, piece, number names 0 to 10 Visual: pictures of collections five frame blank number line number chart to 10 	 Concrete materials: computers and other electronic devices manipulative materials (random placement, in a line patterns, pairs, three in a row, domino pattern, quantity of number, e.g. four is four objects or three balls and one bat or two balls and two bats) Verbal: counting (forward to 100, forward in 2s to 20, backward in 1s from 10) operation to be used estimates explanations of reasoning calculation strategies and reasonableness of solutions mathematical language: add, take away and ways to calculate, cover up, part, whole, number names 0 to 10 Written: symbolic: add (+), subtract (-) words and electronic for number patterns, e.g. + 1, + 2, + 3, jottings for calculations Visual: pictures five frame, ten frame number chart to 100 subitising (seeing groups of two or three objects and patterns of larger numbers without counting), e.g. five domino pattern 	 Concrete materials: computers and other electronic devices manipulative materials (groups of 5 and 10, rows of 2 or 3, different combinations of numbers to same value) Verbal: counting (forward in 2s, 5s, 10s to 100, strategies for operations counting from different numbers, extensions to larger numbers, backward in 1 s from any number) operation to be used estimates explanations of reasoning calculation strategies and reasonableness of solutions mathematical language: number names to 100, fraction names, add, subtract, left, multiply and divide, groups of, rows of, jumps of, share between, share, odd, even Written: symbolic: equals (=), does not equal (#) words and electronic devices Visual: pictures five frame, ten frame number line number line subitising 	 Concrete materials: computers and other electronic devices manipulative materials (number patterns, different combinations of numbers to equivalent value, sharing materials into groups and making groups) Verbal: counting (forward in 10s, 100s to three-digit numbers, extensions to larger numbers, backwards in 100s and 10s, counting on from different numbers) operation to be used estimates explanations of reasoning calculation strategies and reasonableness of solutions explanations about why one number is smaller or larger based on place value, link different symbolic representations of numbers, fractions and mixed numbers mathematical language: number names to 999, fraction names, add, subtract, multiply and divide, arrays, equal groups of Written: symbolic: multiply (x), divide (÷), fractions, greater than (>), less than (<) calculations for the operations with and without electronic devices sketches Visual: pictures number line number line number line number line number line quarys equal groups pictorial of fractions, e.g. clock 	 Concrete materials: computers and other electronic devices manipulative materials (different combinations of numbers, fractions of objects, parts of collection, parts of measures) Verbal: counting (extensions to larger numbers) estimates explanations of reasoning calculation strategies and reasonableness of solutions mathematical language: number names to thousands, fraction names, decimal names, multiples, factors Written: symbolic: fractions words and electronic calculation for the operations with and without electronic devices number patterns on number lines Visual: number line number chart 	 Concrete materials: computers and other electronic devices manipulative materials (collections of objects, parts of collections, parts of measures, number patterns, different representations, e.g. area, set and linear models) Verbal: counting estimates	 Concrete materials: computers and other electronic devices manipulative materials (different materials for similar purposes, e.g. MAB) Verbal: counting (fractions, e.g. ½, ¾, 1, 1½) estimates explanations of reasoning calculation strategies and reasonableness of solutions mathematical language: percentage Written: index notation for square numbers, e.g. 20k/20 000, \$1.5m/\$1.5 million, \$3b/\$3 billion and electronic devices calculations for the operations with and without electronic devices estimates 	 Concrete materials: computers and other electronic devices manipulative materials Verbal: estimates justifications of reasoning calculation strategies and reasonableness of solutions Written: symbolic: conventional notation for fractions and powers, ratio (:) words and electronic, e.g. spreadsheets calculations for the operations with and without electronic devices estimates of negative numbers on number lines Visual:	 Concrete materials: computers and other electronic devices manipulative materials Verbal: estimates and approximations justifications of reasoning calculation strategies and reasonableness of solutions Written: symbolic: conventions of the four operations including brackets calculations for the operations with and without electronic devices estimates conversions between different representations of rational numbers Visual: number line factor trees 	 Concrete materials: computers and other electronic devices manipulative materials Verbal: estimates for square roots, whole number and decimal approximations justifications of reasoning calculation strategies and reasonableness of solutions Written symbolic: conventions of the four operations including brackets and indices calculation strategies of the operations with and without electronic devices scientific notation on scientific calculators as 1.99 E8 graphical representations of direct proportions Visual: "real number" line factor trees
Concepts and facts	Concepts and facts	Concepts and facts	faces, electronic Concepts and facts	Concepts and facts	Concepts and facts	Concepts and facts	Concepts and facts	Concepts and facts	Concepts and facts
 Money for goods or services, e.g. bus fare, saving and spending 	Purchase price for goods and services	Equivalent value of coins and notes	Estimation of close values, e.g. using \$5 note when the cost is \$4.75	 Available money saving plans spending plans, equivalent amounts 	 Income: household Household budget Saving, borrowing, interest and fees Spending, transaction fees on cards 	 Factors influencing financial decisions, transactions and spending: value for money budget percentage discounts methods of payment, e.g. EFTPOS, credit and debit cards cash available income or savings 	 Factors influencing financial decisions, transactions and spending: value for money budget methods of payment, e.g. EFTPOS, credit and debit cards, cheques and money orders available income or savings interest 	 Factors influencing financial decisions, transactions and expenditure Income: rates of pay Cash, credit and debit transactions: benefits consequences Fees and charges organisations 	 Factors influencing financial decisions, transactions and expenditure Cash, credit and debit transactions: cost-benefit analysis Fees and charges Governments, e.g. goods and services taxes
Procedures	Procedures	Procedures	Procedures	Procedures	Procedures	Procedures	Procedures	Procedures	Procedures
 Comparison and sorting Concrete materials: computers manipulative materials, dollar coins, \$5, \$10 notes, financial transaction cards Verbal: everyday language: names of dollar coins and \$5, \$10 notes Visual: features of coins and notes \$1, \$2 coins, \$5, \$10 	Comparison and classification Concrete materials: – computers and other electronic devices – manipulative materials, coins and notes, financial transaction cards Verbal – everyday language: names of coins and notes, cost, price Written: – conventions for representing money Visual: – features of coins to 2 dollars, notes to \$100 – advertising	 Concrete materials: computers and other electronic devices manipulative materials, coins and notes, financial transaction cards verbal: everyday language: names of coins and notes, advertised price, purchase price written: conventions for representing money Visual: features of coins, notes advertising 	 Concrete materials: computers and other electronic devices manipulative materials, coins and notes, financial transaction cards Verbal: everyday language: names of coins and notes, change Written: conventions for representing money	Concrete materials: - computers and other electronic devices - manipulative materials, coins and notes, financial transaction cards Verbal: - everyday language: names of coins and notes, change Written: - simple financial records, e.g. list of expenditure with the leftover balances from savings, simple electronic spreadsheet - conventions for representing money and calculator displays, e.g. 2.8 display means \$2.80 Visual: - prices with fees	 Concrete materials: computers and other electronic devices manipulative materials, coins and notes, financial transaction cards Verbal: everyday language: names of coins and notes, change Written: simple financial records calculator displays, e.g. 2.8 display means \$2.80 financial records, spending and saving plans Visual: prices	 Concrete materials: computers and other electronic devices manipulative materials, credit and debit cards Written: budgets financial records, e.g. table of savings, expenses and balances, electronic spreadsheet conventions for percentage discounts Visual: prices with discounts 	 Concrete materials: computers and other electronic devices manipulative materials, credit and debit cards and money orders Written: budgets financial records cheques conventions for percentage discounts 	 Concrete materials: computers and other electronic devices manipulative materials, credit and debit brochures Written: conventions for percentage discounts Visual: lists tables 	 Concrete materials: computers and other electronic devices manipulative materials, State and Federal Government financial publications Wiritten: lists tables graphs Visual: lists tables graphs

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