

Mathematics

Curriculum overview

All children are entitled to a curriculum and to the powerful knowledge which will open doors and maximise their life chances. Below is a high-level overview of the critical knowledge children will learn in this particular subject, at each key stage from Reception through to Year 11, in order to equip students with the cultural capital they need to succeed in life. The curriculum is planned vertically and horizontally giving thought to the optimum knowledge sequence for building secure schema.

		Knowledge, skills and understanding to be gained at each stage*		
		Cycle 1	Cycle 2	Cycle 3
YEAR 1 Manipulation and making links	New learning	Number Numbers up to 20: identifying, comparing, ordering, doubling, halving, addition, subtraction and number bonds Shape and pattern Common 2D and 3D shapes; positioning; instructional language	Number Telling the time; exploring calculation strategies within 20; numbers to 50; addition and subtraction within 20 Fractions and measures Recognise and find a half, one quarter; compare lengths and masses; measure and record	Number Numbers 50 to 100 and beyond; counting in 1s / 5s / 10s; place value; add / subtract beyond 20; multiply and divide Money and measures Recognise value of coins and notes; add / subtract with money; compare, describe and measure capacity / volume
	Review	Daily Maths Meeting recapping knowledge covered in previous units	Daily Maths Meeting recapping knowledge covered in previous units	Daily Maths Meeting recapping knowledge covered in previous units
YEAR 2 Manipulation and making links	New learning	Number Numbers within 100; add and subtract 2-digit numbers; addition and subtraction word problems; multiply and divide by 2 / 5 / 10 Measures and graphs Measuring length: cm, m; reading scales; tally charts; pictograms; tables; totalling	Number Time; simple fractions of objects; equivalent fractions; 2-digit calculation, including regrouping / adjusting; money Geometry Faces; shapes and patterns; lines; turn; positional language	Number Numbers within 1000; exploring calculation strategies, including mental and formal written methods; multiply / divide by 3 / 4 Measures Capacity and volume measures; appropriate measures for mass; read scales up to 1000
	Review	Daily Maths Meeting recapping knowledge covered in previous units	Daily Maths Meeting recapping knowledge covered in previous units	Daily Maths Meeting recapping knowledge covered in previous units
YEAR 3 Building independence and autonomy	New learning	Number Number sense and exploring calculation strategies; place value; rounding; addition; subtraction using various strategies Measures and graphs Interpret data from charts / tables; solve one-step and two-step problems; measure / compare / add / subtract lengths using appropriate units	Number Multiplication and division methods; problem solving; inverse; formal methods of multiply / divide Time and fractions Tell / record / write time in 12-hour using am / pm; use simple fractions; simple fraction calculation methods	Shape and measure Angles; parallel / perpendicular lines; draw and measure 2D shapes; measure using appropriate tools and units Number Securing multiplication and division for 6 and 8 times tables; mental addition / subtraction; numbers beyond 1000
	Review	Daily Maths Meeting recapping knowledge covered in previous units	Daily Maths Meeting recapping knowledge covered in previous units	Daily Maths Meeting recapping knowledge covered in previous units
YEAR 4 Building independence and autonomy	New learning	Number Reasoning with 4-digit numbers; rounding; addition / subtraction; multiplication / division methods Data Discrete and continuous data; interpret and present using graphical methods	Number Securing multiplication facts; equivalent fraction; add / subtract fractions to more than 1; decimals Geometry Time conversions; calculate perimeter and area of rectilinear shapes	Problem solving Solving problems involving measure and money; fractions and decimals Geometry and pattern Shape and symmetry; position and direction; reasoning with patterns and sequences; 3D shapes
	Review	Daily Maths Meeting recapping knowledge covered in previous units	Daily Maths Meeting recapping knowledge covered in previous units	Daily Maths Meeting recapping knowledge covered in previous units
YEAR 5	New learning	Number Reasoning with large whole numbers; integer addition and subtraction; factors; primes; squares; cubes	FDP Converting between fractions; decimals and percentages; four operations with fractions	Number Solving multi-step problems with whole numbers and decimals using all operations



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YEAR 5	Formalisation and consolidation			
	New learning	Graphs and geometry Tables and line graphs; perimeter and area of non-rectilinear shapes	Angles and transformations Acute; obtuse; reflex, draw and measure angles; angle facts; translations; reflections	Geometry Unit conversion; regular and irregular polygons; nets of 3D shapes; circles; volume / capacity and cube numbers
	Review	Daily Maths Meeting recapping knowledge covered in previous units	Daily Maths Meeting recapping knowledge covered in previous units	Daily Maths Meeting recapping knowledge covered in previous units
	Domain	Maths week involving various enrichment activities / tasks		
YEAR 6	Formalisation and consolidation			
	Application and extension of key skills	Integers and decimals addition and subtraction; multiplication and division; calculation problems including algebraic solving	Equivalence; simplification; comparing, ordering and calculation of fractions; missing angles and lengths; coordinates and shapes	Conversions of metric measures; time; area; volume; FDP equivalence; statistical diagrams; averages; proportion problems
	Review	Daily Maths Meeting recapping knowledge covered in previous units	Daily Maths Meeting recapping knowledge covered in previous units	Daily Maths Meeting recapping knowledge covered in previous units
	Domain	Maths week involving various enrichment activities / tasks		
YEAR 7	Formalisation and consolidation			
	New learning	Unit 1: Add and Subtract Place value; +/- methods; decimals; estimation; rounding; perimeter Unit 2: Multiply and Divide Factors and multiples; HCF and LCM; \times/\div methods; decimals; areal; averages	Unit 3: Geometry Unit conversions; identify, draw and measure angles; properties of 2D shapes; angle facts Unit 4: Fractions Four operations; comparing; ordering; fractions of amounts	Unit 5: Algebra Notation; simplifying; substituting; forming; solving; sequences Unit 6: Percentages and Statistics Statistical diagrams; pie charts; fraction / decimal / %; % of; reverse %
	Review	Do Nows recapping topics covered in previous unit	Do Nows recapping topics covered in previous unit	Do Nows recapping topics covered in previous unit
	Domain	Maths week involving various enrichment activities / tasks		
YEAR 8	Formalisation and consolidation			
	New learning	Unit 1: Number Index laws; powers and roots; prime factorisation; set notation; fractions Unit 2: Algebra Inequalities; forming and solving; worded questions; sequences	Unit 3: 2D Geometry Constructions; angle facts; conversions; composites; area Unit 4: Proportional Reasoning FDP conversions; % increase / decrease; rates and ratio; speed / distance / time	Unit 5: 3D Geometry Estimation; circles; nets; plans and elevations; volume Unit 6: Statistics Representing data; comparing data sets; MMR from tables; frequency diagrams
	Review	Do Nows recapping topics covered in previous unit	Do Nows recapping topics covered in previous unit	Do Nows recapping topics covered in previous unit
	Domain	Maths week involving various enrichment activities / tasks		
YEAR 9	Application and extension			
	New learning	Unit 1: Graphs and Proportion Coordinates; direct / inverse proportion; scales; standard form Unit 2: Algebraic Expressions Sequences; algebraic manipulation; transposing; expansion; factorisation	Unit 3: 2D Geometry Constructions; loci; triangles and quadrilaterals; congruence and similarity; polygon angles Unit 4: Equations and Inequalities Construct and solve equations / inequalities; graphs	Unit 5: Geometry Pythagoras; trigonometry introduction; transformations Unit 6: Statistics Probability; grouped data; scatter graphs
	Review	Do Nows recapping topics covered in previous unit	Do Nows recapping topics covered in previous unit	Do Nows recapping topics covered in previous unit
YEAR 10	Application and extension			
	New learning	Unit 1: Number Indices; standard form; growth / decay; non-linear sequences Unit 2: Geometry Enlargement; similarity; bearings; trigonometry sides / angles	Unit 3: Reasoning Algebraic argument; loci; linear functions; parallel / perpendicular lines; vectors Unit 4: Geometry and Number 3D shapes; decimal calculations; harder 3D shapes; proof; limits	Unit 5: Sampling and Probability Sampling methods; combined probabilities; sets and Venn diagrams Unit 6: Applications of Algebra Binomials; quadratic equations; complex graphs; simultaneous equations
	Review	Do Nows recapping topics covered in previous unit	Do Nows recapping topics covered in previous unit	Do Nows recapping topics covered in previous unit



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YEAR 11	Application and extension of key skills	Quadratic equations, linear functions, 3D Pythagoras, 3D Trigonometry, Sine and Cosine rules, trigonometric identities, vectors, function algebra	Gradients and areas of curves, transformations of functions, transpose formulae, iteration, quadratic inequalities, algebraic fractions, geometric proof, and algebraic proof	

See link to GCSE mathematics specification:

<https://qualifications.pearson.com/content/dam/pdf/GCSE/mathematics/2015/specification-and-sample-assessment/gcse-maths-2015-specification.pdf>

*A powerful, knowledge-rich curriculum teaches both **declarative knowledge** (facts; knowing that something is the case; what we think about) and non-declarative or **procedural knowledge** (skills and processes; knowing how to do something; what we think with). There are no skills without bodies of knowledge to underpin them.

In some subjects, a further distinction can be made between substantive knowledge (the domain specific knowledge accrued e.g. knowledge of the past) and disciplinary knowledge (how the knowledge is accrued e.g. historical reasoning).

Please refer to the DAT Curriculum Principles, published on our website, for further information about how we have designed our all-through curriculum.

