



Lotus
Academy

Mathematics Curriculum Learning for Life



Mathematics Overview

Intent

The mathematics curriculum at Lotus Academy is coherently planned, sequenced, and delivered to ensure that all pupils leave school numerate, mathematically competent, and equipped with the functional skills required to navigate the modern world. We aim to foster computational fluency, spatial reasoning, and logical problem-solving while using mathematics as a powerful vehicle to develop emotional regulation, cognitive flexibility, and resilience.

Our curriculum framework is driven by an adapted, mastery-focused approach inspired by the White Rose Maths progression models. However, recognising that the complex SEMH profiles of our learners create uneven educational histories, our curriculum is intentionally designed to be highly flexible and adaptive to those needs. Rather than rigidly adhering to White Rose which does not always give appropriate time to each step of the programme, we utilize a range of high-quality diagnostic resources: including White Rose Maths, Corbett Maths, Maths Genie, Dr Austin Maths, Go Teach Maths, Pixi Maths, Twinkl, and Sumdog, allowing teachers to branch out responsively to fill conceptual gaps.

The curriculum prioritises depth of understanding over superficial speed, establishing secure substantive knowledge (declarative facts and procedural methods) before advancing pupils to disciplinary applications (reasoning and problem-solving). Our ultimate intent is to dismantle mathematics anxiety, repair prior negative experiences of education, and empower every pupil to achieve their maximum potential. Whether a pupil's optimal path is achieving an Entry Level certificate, or securing a formal GCSE qualification, our curriculum places no artificial ceilings on learning, providing a robust bridge to post-16 opportunities, careers, and fulfilled adulthood.

Implementation

The mathematics curriculum is structured around four core conceptual pillars: **Number and Place Value, Calculation and Fluency, Algebraic and Proportional Reasoning, Geometry and Measures** which are continually revisited, spaced, and strengthened. Content is mapped across multi-year cycles to accommodate pupils working beneath chronological age-related expectations, ensuring that learning is pitched accurately to the individual rather than age labels.

- **Number and Place Value:** A profound understanding of number structures underpins our entire curriculum. In Key Stage 2 and Key Stage 3, teaching focuses heavily on core numbers, addressable through systematic gap analysis. Concepts are unlocked using a Concrete-Pictorial-Abstract (CPA) approach, heavily utilizing physical manipulatives (such as dienes, Numicon, and place-value counters) alongside digital retrieval systems like Sumdog during tutor time. This builds the secure baseline required to access complex multi-digit mathematics.
- **Calculation and fluency:** Multiplicative reasoning accounts for a massive portion of secondary mathematics success. We systematically isolate and reinforce basic math facts, methods, and mental calculation pathways to reduce cognitive load. This fluency reduces lesson frustration, directly supporting

the emotional regulation of our pupils. In Key Stage 4, the curriculum shifts to prepare pupils for the GCSE specification or functional skills. We focus on exam mechanics and the cultivation of independent study. Lessons are structured to dismantle exam anxiety by familiarising pupils with multi-step questions, systematically extract data from word problems, and apply formula sheets effectively.

- **Algebraic and Proportional Reasoning:** Pupils are supported to look for patterns, identify mathematical structures, and express rules. This domain focuses strongly on the language of maths, ensuring that pupils are fluent in interpreting visual frameworks (such as bar models and part-whole diagrams) and technical terminology. By developing this specialized abstract vocabulary, pupils will learn to talk through mathematical ideas logically.
- **Measure and Geometry:** Mathematical concepts are bound to real-world context. Pupils learn to collect data, read timetables, manage money, and calculate spatial dimensions. Lessons are practical, responsive, and adaptive, frequently branching out into functional simulations such as budgeting roleplay or scale building using tools from Go Teach Maths and Twinkl so that pupils recognize the value of mathematics in. Across both primary and secondary frameworks, the curriculum breaks geometry down into core blocks: Properties of Shape and Position and Direction. Students explore a wide range of broad topics: primary focus on spatial reasoning, shape composition, and sorting then progress to calculating perimeter, area, and angles. Middle stages introduce coordinates across four quadrants, transformations and volume leading to Pythagoras, trigonometry and vectors for our more able upper students.

Pedagogical Approach: ‘Learn It, Use It, Apply It’

To ensure a secure depth of understanding, mathematics is taught through a responsive, week-long diagnostic structural cycle:

- **Learn It:** Pupils are introduced to a distinct substantive skill, receiving highly scaffolded opportunities for deliberate practice, concrete manipulation, and consolidation using varied conceptual frameworks.
- **Use It:** Pupils manipulate the newly mastered skill across alternative contexts. Varied fluency is the defining feature of this phase, altering the visual representation or question style to combat rigid thinking.
- **Apply It:** Pupils advance to non-routine reasoning and problem-solving. True conceptual mastery is demonstrated when a pupil can independently apply the idea to decode a multi-step problem. Pupils are only transitioned to the next topic once they can securely apply their current learning helping the transition to long-term memory.

The Lotus Academy Lesson Structure

Anxiety is actively mitigated through radical predictability, environmental safety, and therapeutic lesson routines. Every mathematics lesson operates through a strictly chunked, transparent sequence:

1. Settler / Starter

Lesson starters begin with an autonomous settler, offering pupils an element of choice to support immediate self-regulation and SEMH transitions. Once regulated, pupils complete retrieval practice designed to commit key facts to long-term memory.

- a. Across Key Stages 2 and 3, teachers deploy standard Flashback 4 formats pulled directly from the White Rose support materials to provide structural familiarity, alongside custom Tough Ten grids focusing on core written methods for the four operations.
- b. Key Stage 4 utilizes 5-a-day formats for examination retention and build long-term memory.

2. Modelling

Teachers introduce new concepts in digestible steps. Scaffolding is visual and tactile when required, building in independence over time as pupil confidence stabilises.

3. Collaborative Activity

Pupils work with staff or peers to practice the new skill. This phase builds communication skills, confidence, and healthy peer relationships.

4. Independent Learning

Pupils complete tasks tailored to their attainment band. Tasks are chunked in a way to encourage engagement whilst building on skills demonstrated in the collaborative stage. Tasks will begin with more arithmetic focussed questions slowly building up to a reasoning focus.

5. Reflection

Lessons close with a opportunity for pupils to assess the new mathematical skills visited in the lesson reflect on their engagement and process their emotional states, preparing them for a regulated transition to their next lesson.

Mathematics LTP

	Autumn	Spring	Summer
Year 3/4 – Cycle A Pupils will follow the year 1 strand of the mixed y1/2 curriculum	Place Value: Count inside 10, 20, and 100; use number lines; identify tens and ones. Addition and Subtraction: Fact families; number bonds to 10, 20, and 100; add/subtract 1 and 2-digit numbers. Shape: Recognize and sort 2D and 3D shapes; find lines of symmetry.	Mastering Number: Use 2, 5, and 10 times tables; group and share into equal arrays. Length and Height: Measure and compare lengths using centimetres and metres. Mass, Capacity and Temperature: Read scales in grams, kilograms, millilitres, litres, and degrees Celsius	Fractions: Find halves, quarters, thirds, and simple equivalent non-unit fractions. Money: Identify coins/notes; count combinations of pence and pounds; calculate change. Time: Tell time to the hour, half-hour, quarter-past/to, and 5-minute intervals. Position, Direction and Statistics: Use directional language; interpret simple tally charts and pictograms.
Year 3/4 – Cycle B Pupils will follow the year 2 strand of the mixed y1/2 curriculum	Place Value & Partitioning: Master standard/non-standard partitioning up to 100; locate numbers on blank number lines. Addition & Subtraction Methods: Add and subtract tens mentally; cross the 10s boundary using formal written columns. Properties of Shapes: Compare vertices and edges of 3D shapes; identify vertical symmetry.	Multiplication and Division: Odd/even numbers; practice division by sharing; count in 2s, 5s, and 10s. Measurement Blocks: Deep dive into practical measuring; order lengths and scale volume.	Fractions of Quantities: Find unit fractions of sets of objects; spot equivalent halves and quarters. Financial Maths: Solve multi-step word problems involving real-world money transactions. Time and Data: Calculate time durations; build and read block diagrams and simple statistics tables.
Year 5/6 – Cycle A Pupils will follow the year 3 strand of the mixed y3/4 curriculum	Place Value: Scale numbers up to 1,000 and 10,000; find 10, 100, or 1,000 more/less. Addition and Subtraction: 3-digit and 4-digit column methods; estimate answers; check inverse operations. Area: Find area of rectilinear figures by counting unit squares.	Multiplication and Division: Recall 3, 4, 8, 6, 7, 9, 11, and 12 times tables; short multiplication methods. Length and Perimeter: Measure in millimetres, centimetres, metres; calculate perimeters of rectilinear shapes. Fractions: Understand unit/non-unit fractions; count in tenths and hundredths; find equivalent fractions.	Decimals: Write decimals; link tenths and hundredths; divide 1 or 2 digits by 10 and 100. Money & Time: Solve scaling money problems; convert time between digital, analogue, and 12/24-hour clocks. Geometry & Statistics: Identify acute, obtuse, and right angles; interpret bar charts, pictograms, and tables.
Year 5/6 – Cycle B Pupils will follow the year 4 strand of the mixed y3/4 curriculum	Advanced Place Value: Order numbers to 10,000 using a place value chart; count in 50s and 100s. Calculations: Apply efficient column addition/subtraction to multi-step word problems. Multiplication Facts: Factor pairs; solve complex scaling problems using arrays.	Fractions of Amounts: Calculate fractions of quantities; add and subtract fractions with common denominators. Length & Scaling: Convert units of length; calculate perimeter of composite geometric shapes.	Decimals & Percentages: Compare numbers with up to two decimal places; round decimals to nearest whole. Data & Statistics: Read and construct line graphs; solve comparison problems from database charts. Geometry & Direction: Classify triangles and quadrilaterals; read, plot, and translate coordinates in the first quadrant.

	Autumn	Spring	Summer
Year 7/8 – Cycle A Pupils will follow the year 5 strand of the mixed y5/6 curriculum	Place Value: Read, write, and order integers up to 1,000,000 and 10,000,000; use negative numbers. Four Operations: Multi-digit formal long multiplication and division; apply order of operations (BIDMAS). Fractions: Simplify fractions; add and subtract fractions with different denominators; multiply/divide fractions by integers.	Decimals and Percentages: Work with decimals to 3 decimal places; convert fractions to decimals and percentages. Ratio and Proportion: Use ratio symbols; scale recipes; solve proportion problems using bar models. Algebra: Formulate simple algebraic expressions; find rules; substitute variables into basic formulas.	Area, Perimeter and Volume: Calculate area of parallelograms/triangles; calculate volume of cuboids. Statistics: Interpret pie charts and line graphs; calculate the arithmetic mean. Geometry & Position: Measure angles in degrees; calculate angles on straight lines/around points; plot grids across four quadrants.
Year 7/8 – Cycle B Pupils will follow the year 6 strand of the mixed y5/6 curriculum	Algebraic Thinking: Describe linear sequences; simplify expressions by collecting like terms. Place Value & Number Lines: Compare fractions and decimals; evaluate numbers using powers of 10. Four Operations Mastery: Refine mental and written strategies for directed numbers and large integers.	Fractional Thinking: Solve fractions of amounts; multiply and divide cross-combinations of fractions. Equations: Solve one-step and two-step linear equations; form algebraic expressions from word problems.	Lines and Angles: Calculate missing angles in triangles/quadrilaterals; use geometric notation for lines and angles. Ratio and Scaling: Share amounts into specific target ratios; scale geometric 2D shapes. Perimeter, Area and Volume: Explore properties of 2D shapes; calculate area of standard polygons; estimate volume.
Year 9 – Pupils recap topics from GCSE grade 1 and 2 in a more exam focussed context. Small amount of grade 3 topics filtered in where appropriate	Four operations: pupils will consolidate techniques for non-calculator operations as well as ensuring they are secure in their times tables and division facts Fractions: Pupils will consolidate knowledge in manipulating fractions Rounding: Pupils will be able to round to a given place value including decimals. Introduce significant figures Geometry: Recap facts on angles and use a formula to find the area of a basic shape	Fractions, decimals and percentages: Pupils will recap the four operations on fractions and mixed numbers then move to converting between FDP Statistics: Calculate mean, median mode and range and apply them to exam style questions Algebra: Solve 1 and 2 step equations by calculating inverse operations and substitute into an equation, represent inequalities on a number line Probability: Understand probability as a scale from 0-1, calculate expected and experimental probability of a single event and some basic multiple events	Ratio and proportion: Share and represent an amount in a ratio. Use proportion to adjust recipes and use proportion to identify best value for money Data handling: Represent data in a variety of ways and apply mean, median and mode calculations where appropriate Exam skills: Introduce exam technique, calculator skills and using equations provided to help better understand questions
Year 10/ Year 11 – Full GCSE 2-year syllabus. Mostly focussed on grade 3-4 with challenge applied as appropriate to	Number: Four operations with integers; four operations with decimals and negative numbers; order of operations; factors, multiples and prime numbers; HCF, LCM and prime factor decomposition; place value, rounding and estimation. Fractions, Decimals and Percentages: Equivalent, simplifying and ordering fractions; fractions of	Algebra: Substitution; collecting like terms; laws of indices; expanding single and double brackets; factorising single and double brackets; solving equations; forming and rearranging formulae; sequences. Statistics: Mean, median, mode and range; frequency tables; pictograms; bar charts; frequency polygons; two-way tables; frequency	Geometry: Properties of 2D and 3D shapes; plans and elevations; reflections; rotations; translations; enlargements; constructions; loci. Probability: Probability scale; probability calculations; experimental probability; probability spaces; probability trees. Ratio and Proportion: Simplifying ratios; sharing ratios; combining ratios; recipes; value for money;

	Autumn	Spring	Summer
achieve the highest grade possible.	amounts; mixed numbers and improper fractions; four operations with fractions; fraction, decimal and percentage conversions; percentages of amounts; percentage increase and decrease; reverse percentages; simple and compound interest. • Measure: Perimeter; area of rectangles, triangles, compound shapes and trapezia; circumference and area of circles; volume; surface area.	trees; pie charts; stem-and-leaf diagrams; scatter graphs. • Geometry: Angle facts; angles in triangles and polygons; parallel line angles; reflection symmetry; rotational symmetry.	direct proportion; indirect proportion; compound measures. • Graphs: Straight-line graphs; gradient; equation of a straight line. • Pythagoras and Trigonometry: Pythagoras' Theorem; trigonometry.