Walthamstow Academy – Maths Curriculum Journey

Our Curriculum Intent

OUR VISION:

To ensure that our maths curriculum challenges, engages, and inspires all learners to be lifelong mathematical thinkers, empowered with mathematical fluency and love of the universal language of mathematics.

Maths is a universal language and we at Walthamstow Academy want every child to understand and enjoy this universal language and use it confidently throughout their adult lives.

All our students have access to our rich maths curriculum which ensures all students gain a good in depth understanding of the taught topics by the end of their five- or seven-year journey in mathematics. We have designed our maths curriculum to build on pupils' prior knowledge of maths, teach new concepts in relation to this prior knowledge (as we know that knowledge is 'sticky' and this is the most efficient way of developing student schemas of mathematical knowledge, and then stretching and challenging the students wherever possible so that they can understand, apply, and enjoy the topics in greater depth.

Our curriculum encompasses the following **three components** to ensure that all students can progress through our maths curriculum:

Recall: Recall, review and build upon prior mathematical knowledge is vital and is planned for before new mathematical concepts are taught.

Fluency: We ensure that pupils of all abilities can access the basic mathematical skill set through regular fluency checks. This is very important to instil the confidence in students, which then enables them to enjoy the content.

Reasoning and Problem Solving: This is an important component of the maths curriculum and enables and empowers our students to understand the skills in greater depth. We first help them develop student fluency and then build on that through discussion and shared problem solving.

OUR PRINCIPLES:

- **Entitlement**: All pupils in maths are exposed to extensive number, algebra, geometry, proportion, and statistics content. This ensures that all pupils can access all areas of maths and have time to develop their skills as they progress through the maths curriculum.
- **Coherence**: Our curriculum has been carefully sequenced to ensure that knowledge is revisited each academic year, and to ensure that common misconceptions in topic areas are avoided, through explicit direct instruction and systematic checking for understanding.
- **Mastery**: Mathematical concepts are taught in-depth and continually revisited through careful interleaving of content into future teaching topics. The focus on retention of knowledge is at the core of the maths curriculum; the mastery approach supports this.
- **Representation**: Maths is universal, providing all pupils with an elegant and logical way of viewing the world. Where our resources include names and places, these have been selected to be inclusive. We believe that a secure understanding of maths is an essential starting point for all young people.
- **Education with character**: Mathematics is a common language in which all pupils can solve, analyse, and problem solve. Our curriculum supports pupils to build logical reasoning, critical thinking and is mentally rigorous.

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Our Curriculum Progression Model

Sequencing is vital and is the basic thread used for weaving the powerful yet complex nature of the curriculum. Sequencing of the topics in our scheme of work is done to ensure the topics are taught in great depth through a mastery structure and as well as spiralled into various points in the key stages to ensure they are revisited and built on further- every time adding a layer of skill on the prior pillar of knowledge. To do this, teachers constantly check for prior knowledge and revisit topics regularly as part of the do now and homework.

When sequencing topics, we aim to ensure that students are equipped with all the necessary skills to progress between the key stages in their learning. We aim to strike a thoughtful balance between introducing new content, emphasising links between mathematical topics and the students' need to spend time revisiting material so that they are successful.

KS3

- The Maths learning journey in Year 7 begins with checking prior KS2 knowledge and building on from there to strengthen the concepts learnt in Y6. This helps pupils build their confidence and then we slowly yet impactfully build on and help them master the previously learnt skills. Much of Year 7 focuses on developing students' proficiency in number and basic algebra, which will enable them to progress through our curriculum in future years. In year 8 and 9, pupils build on further on some prior learnt skills while many new skills especially in shape/measures and data handling are now introduced to create a much needed strong foundation for KS4 Maths.

KS4

- At KS4 pupils build on knowledge and skills developed at KS3. Topics continue to be sequenced methodically at KS4. This could be building on from understanding substitution in year 7 to solving linear equations in Year 8 and 9 . This is then used to introduce straight line graphs in year 10 including substituting points in a table to plotting the linear graphs. We don't stop there and we then move on to quadratic graphs, cubic graphs, reciprocal graphs giving pupils the deeper understanding of how they can link algebra and graphs and how any equation can be solved algebraically as well as graphically to get the same solutions.

KS5

- In Sixth form pupils who study A Level Maths work through a series of topics in Y12 which delve further into their GCSE knowledge of important skills like indices.
- Pure and Applied Mathematics are taught concurrently and sequenced such that any prerequisite knowledge needed for Applied Mathematics is taught first in Pure. For example, the binomial expansion is taught before binomial distributions are studied in Statistics.

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Half Term	Curriculum Content	Assessment(s) *(assessment title, duration and approx date)*	Extra-Curricular Options *(Places to visit; wider reading; clubs to join)*
Year 7 Curriculum Overview: *Year 7 curriculum is a broad range of topics from Number, Algebra, Shapes and Measure and Data*			
Year 7 HT1	Students will learn about/ develop skills of: • Numerical Skills • Order of operations • Basic rules of algebra • Factors and Multiples • Expand and factorise	End of topic tests – 30 min at the end of most topics	• Pupils encouraged to work on XP section of Sparx and explore the topics taught in greater depth. • Maths games on Sparx

Year 7 HT2	Students will learn about/ develop skills of:
	• Addition and Subtraction
	• Perimeter
	• Multiplication and Division
	• Area of rectangles, triangles and parallelograms
		End of topic tests – 30 min at the end of most topics	• Watch following films
			  ○ Hidden figures
			  ○ Cube

Year 7 HT3	Students will learn about/ develop skills of: • Fraction Manipulation • Adding and Subtracting Fractions • Comparing and Ordering Fractions • Fractions of amounts	End of topic tests – 30 min at the end of most topics	• UKMT clubs for selected pupils
Year 7 HT4	Students will learn about/ develop skills of: • Substitution • Angles • Polygons	End of topic tests – 30 min at the end of most topics	Visit • Bank of England • Science Museum • V&A Museum • Bletchley Park
Year 7 HT5	Students will learn about/ develop skills of: • Symmetry and reflection • Coordinates	End of topic tests – 30 min at the end of most topics	• Have a go at the Sudoku daily in newspapers • Play number games – guess the number • Visit Escape Rooms • Try Codebreaker challenge

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Year 7 HT6	Students will learn about/ develop skills of: • Mean • Two Way tables	End of topic tests – 30 min at the end of most topics	
Term	**Curriculum Content**	**Assessment(s)** *(assessment title, duration and approx date)*	**Extra-Curricular Options** *(Places to visit; wider reading; clubs to join)*
Year 8 Curriculum Overview: *Year 8 curriculum is a broad range of topics from Number, Algebra, Shapes, Measure and Data*			
Year 8 HT1	Students will learn about/ develop skills of: • Powers and Roots • Prime Factorisation • Rounding • Fractions • Negative Number Review	End of topic tests – 30 min at the end of most topics	• Pupils encouraged to work on XP section of Sparx and explore the topics taught in greater depth. • Maths games on Sparx
Year 8 HT2	Students will learn about/ develop skills of: • Linear equations • Coordinates and basic graphs	End of topic tests – 30 min at the end of most topics	• Watch following films ○ Hidden figures Cube
Year 8 HT3	Students will learn about/ develop skills of: • Units of measurement • Angles • Circumference	End of topic tests – 30 min at the end of most topics	• UKMT clubs for selected pupils
Year 8 HT4	Students will learn about/ develop skills of: • Proportional reasoning • Fractions, decimals, and percentages • Ratio	End of topic tests – 30 min at the end of most topics	Visit • Bank of England • Science Museum • V&A Museum • Bletchley Park
Year 8 HT5	Students will learn about/ develop skills of: • Area of circles and trapezia • Presenting and interpreting data • Averages	End of topic tests – 30 min at the end of most topics	• Have a go at the Sudoku daily in newspapers • Play number games – guess the number • Visit Escape Rooms

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			• Try Codebreaker challenges
Year 8 HT6	Students will learn about/ develop skills of: • 3-D visualisation • Volume	End of topic tests – 30 min at the end of most topics	
Term	**Curriculum Content**	**Assessment(s)** ***(assessment title, duration and approx date)***	**Extra-Curricular Options** ***(Places to visit; wider reading; clubs to join)***
Year 9 Curriculum Overview: *Year 9 is a critical year as it helps bridge the gap between KS3 and KS4.*			
Year 9 HT1	Students will learn about/ develop skills of: • Decimal Manipulation • Estimation & Limits of Accuracy • Related calculations • HCF and LCM of large numbers • Fraction Calculations	End of topic tests – 30 min at the end of most topics	• Pupils encouraged to work on XP section of Sparx and explore the topics taught in greater depth. Maths games on Sparx
Year 9 HT2	Students will learn about/ develop skills of: • Algebraic Manipulation • Index Laws • Expanding and Factorising • Expressions and Substitution	End of topic tests – 30 min at the end of most topics	• Watch following films • The theory of Everything • Imitation game • A beautiful mind • The Man who knew about infinity • Hidden figures
Year 9 HT3	Students will learn about/ develop skills of: • Percentages with calculators • Proportion • Probability	End of topic tests – 30 min at the end of most topics	• UKMT clubs for selected pupils
Year 9 HT4	Students will learn about/ develop skills of: • Linear Equations • Linear Inequalities • Sequences • Pythagoras	End of topic tests – 30 min at the end of most topics	Visit • Bank of England • Science Museum • V&A Museum • Bletchley Park

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Year 9 HT5	Students will learn about/ develop skills of: • Interior and Exterior Angles • Parallel lines • Basic vectors • Basic transformations	End of topic tests – 30 min at the end of most topics	• Have a go at the Sudoku daily in newspapers • Play number games – guess the number • Visit Escape Rooms • Try Codebreaker challenges
Year 9 HT6	Students will learn about/ develop skills of: • Plans and Elevations • Circles and Surface Area	End of topic tests – 30 min at the end of most topics	
Term	**Curriculum Content**	**Assessment(s)** ***(assessment title, duration and approx date)***	**Extra-Curricular Options** ***(Places to visit; wider reading; clubs to join)***
Year 10 Curriculum Overview: *Y10 is the beginning of the GCSE path. Students learn the topics over 2 years which will be tested in the GCSE exam*			
Year 10 HT1	Students will learn about/ develop skills of: • Rearrange formulae • Linear Graphs • y = mx + c • Compound Measures	End of topic tests – 30 min at the end of most topics	• Pupils encouraged to work on XP section of Sparx and explore the topics taught in greater depth. Maths games on Sparx
Year 10 HT2	Students will learn about/ develop skills of: • Quadratic graphs, TP and roots • Further expanding & factorising (Higher only) • Linear Simultaneous Equations • Further graphs	End of topic tests – 30 min at the end of most topics	• The theory of Everything • Imitation game • A beautiful mind • The Man who knew about infinity • Hidden figures
Year 10 HT3	Students will learn about/ develop skills of: • Probability • Capture & Recapture (Higher only) • Standard Form • Proportion (algebraic) (Higher only)	End of topic tests – 30 min at the end of most topics	• UKMT clubs for selected pupils
Year 10 HT4	Students will learn about/ develop skills of: • Simple interest • Growth & Decay • Ratio (further)	End of topic tests – 30 min at the end of most topics	Visit • Bank of England • Science Museum • V&A Museum

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	• Recurring decimals (Higher only)		• Bletchley Park
Year 10 HT5	Students will learn about/ develop skills of: • Statistics basics • Surds (Higher only) • Bounds (Higher only)	End of topic tests – 30 min at the end of most topics	
Year 10 HT6	Students will learn about/ develop skills of: • Right angled Trigonometry (Higher only) • Similar shapes (Higher only) • Quadratic sequences (Higher only)	End of topic tests – 30 min at the end of most topics	
Term	**Curriculum Content**	**Assessment(s)** ***(assessment title, duration and approx date)***	**Extra-Curricular Options** ***(Places to visit; wider reading; clubs to join)***
Year 11 Curriculum Overview: *Topics ae taught to Y11 students up to Dec for Foundation tier and March for the Higher tier. After this we follow an intense revision program.* *The YT11 exam consists of 3 papers - each of 80 marks and the total is calculated out of 240. Grades are awarded on the total mark.*			
Year 11 HT1	Higher Tier will learn about/ develop skills of: • Solving quadratics & further Simultaneous equations • Functions • Iteration • Transformations • Statistics (Further) Foundation Tier will learn about/ develop skills of • Pythagoras • Right angled Trigonometry • Transformations • Similar shapes • Bearings & Scale Drawings	End of topic tests – 30 min at the end of most topics	
Year 11 HT2	Higher Tier will learn about/ develop skills of: • Further Trigonometry & Trigonometric graphs • Quadratic inequalities • Algebraic proof • Bearings	End of topic tests – 30 min at the end of most topics	

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	Foundation Tier will learn about/ develop skills of • Vectors • Congruence		
Year 11 HT3	Higher Tier will learn about/ develop skills of: • Circle theorems • Solving quadratics & further Simultaneous equations • Graphical transformations • Gradients (Further), and area under a graph • Vectors Foundation Tier will start the revision program	End of topic tests – 30 min at the end of most topics	
Year 11 HT4	Higher Tier will learn about/ develop skills of: • Congruence • Kinematics • Constructions & Loci Foundation Tier will start the revision program	End of topic tests – 30 min at the end of most topics	
Year 11 HT5	• Intense Revision program for both Higher and Foundation tier	Past paper practice	
Term	**Curriculum Content**	**Assessment(s)** ***(assessment title, duration and approx date)***	**Extra-Curricular Options** ***(Places to visit; wider reading; clubs to join)***
Year 12 Curriculum Overview: Pupils are taught the AS course in one year**.** Maths is taught over 10 lessons a fortnight – 7 in Pure and 3 in Applied.			
Year 12 HT1	In Pure Maths, students will learn about/ develop skills of: • Algebra and functions • Coordinate geometry in the (x, y) plane In Applied Maths, students will learn about/ develop skills of: • Statistical sampling • Data presentation and interpretation • Probability	End of topics tests for 1 hour after every topic	
Year 12 HT2	In Pure Maths, students will learn about/ develop skills of: • Further algebra	End of topics tests for 1 hour after every topic	

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	In Applied Maths, students will learn about/ develop skills of: • Statistical distributions • Statistical hypothesis testing Probability		
Year 12 HT3	In Pure Maths, students will learn about/ develop skills of: • Trigonometry • Vectors (2D) In Applied Maths, students will learn about/ develop skills of: • Quantities and units in mechanics • Statistical hypothesis testing Probability	End of topics tests for 1 hour after every topic	
Year 12 HT4	In Pure Maths, students will learn about/ develop skills of: • Differentiation In Applied Maths, students will learn about/ develop skills of: • Kinematics 1 (constant acceleration)	End of topics tests for 1 hour after every topic	
Year 12 HT5	In Pure Maths, students will learn about/ develop skills of: • Integration In Applied Maths, students will learn about/ develop skills of: • Forces & Newton's laws	End of topics tests for 1 hour after every topic	
Year 12 HT6	In Pure Maths, students will learn about/ develop skills of: • Exponentials and logarithms In Applied Maths, students will learn about/ develop skills of: • Kinematics 2 (variable acceleration)	End of topics tests for 1 hour after every topic	

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Term	Curriculum Content	Assessment(s) *(assessment title, duration and approx date)*	Extra-Curricular Options *(Places to visit; wider reading; clubs to join)*
Year 13 Curriculum Overview: Maths A Level exam has 2 Pure exams of 100 marks each and 1 exam of Applied for 100 marks			
Year 13 HT1	In Pure Maths, students will learn about/ develop skills of: • Proof • Algebraic and Partial Fractions • Functions and modelling In Applied Maths, students will learn about/ develop skills of: • Regression and Correlation • Probability	End of topics tests for 1 hour after every topic	
Year 13 HT2	In Pure Maths, students will learn about/ develop skills of: • Sequences and Series • The Binomial Theorem • Trigonometry In Applied Maths, students will learn about/ develop skills of: • The Normal Distribution	End of topics tests for 1 hour after every topic	
Year 13 HT3	In Pure Maths, students will learn about • Parametric Equations • Differentiation • Numerical Methods In Applied Maths, students will learn about/ develop skills of: • Moments: Force's turning effect • Forces and Friction	End of topics tests for 1 hour after every topic	
Year 13 HT4	In Pure Maths, students will learn about • Integration • Vectors In Applied Maths, students will learn about/ develop skills of: • Applications of kinematics Projectiles • Application of forces	End of topics tests for 1 hour after every topic	

	• Further Kinematics		
Year 13 HT5	Intense Revision Program	Past paper practice	