Ted Wragg Trust Curriculum Map: MATHEMATICS

Subject sentence – What do we do?

We reject the idea that some pupils 'just can't do maths'. We believe that through hard work all pupils can improve their understanding and be successful. Our aim is to support our pupils to develop a long-term, secure and adaptable understanding of mathematics. This is achieved through developing their fluency, mathematical reasoning and the ability to solve problems in unison. We create confident mathematicians who are creative problem solvers.

How does mathematics equip students with powerful knowledge?

All students in Ted Wragg are exposed to extensive number, algebra, geometry, proportion and data handling content and are not taught on separate pathways until Key Stage 4. We want to support our students in developing a long-term, secure and adaptable understanding of mathematics. We achieve this through developing their fluency, mathematical reasoning and ability to solve problems. Our approach to teaching is underpinned by many of the central tenets of 'mastery' and we ambitiously teach for understanding, not using tricks or gimmicks that only develop partial, or no, understanding of the underlying principles of mathematics. We ensure that students have mastered critical numeracy skills that all adults need to survive in the modern world.

What skills and cultural capital do students gain in mathematics?

Mathematics is a creative and highly interconnected discipline that has been developed over centuries, providing the solution to some of history's most intriguing problems. It is essential to everyday life, critical to science, technology and engineering, and necessary for financial literacy and most forms of employment. At Ted Wragg we aspire to deliver a high-quality mathematics education: providing a foundation for understanding the world, the ability to reason mathematically, an appreciation of beauty and power of mathematics, and a sense of enjoyment and curiosity about the subject and its place in the wider world.

What are the important threshold concepts in mathematics?

We teach threshold concepts as early as possible in key stage 3 as these building blocks are prone to system errors that can derail students early on. They include automaticity with simple calculations, efficient and reliable written methods, directed number, fractions, simplifying and rearranging expressions, solving, rearranging and substituting into equations, order of operations, area and perimeter and simple proportional reasoning. There is a strong focus on key vocabulary and key number facts and relationships throughout the 5-year journey.

How is the mathematics curriculum designed?

We are unapologetic about the spiral nature of our mathematics curriculum. Students learn the key concepts and processes identified in the national curriculum and then engage with them at a deeper level every year throughout their 5-year journey. Following a spiral curriculum enables students to master concepts and ideas, revisiting topics to ensure that a greater depth of knowledge are gained whilst viewing mathematics as interconnected skills rather than disparate topics . Students who grasp concepts rapidly are challenged through rich and challenging tasks with the same narrow focus before accelerating through new content is considered.

How do you use spaced practice / retrieval practice?

Retrieval practice is a feature of every lessons using Do Now activities to secure the retention of core knowledge. These tasks are designed to strengthen recall and develop well-connected mathematical knowledge and questions are cleverly written to ensure that threshold concepts are interwoven throughout independent practice. All Trust schools use Sparx homework, a retrieval-based platform that individualises tasks for the students ensuring they are always challenged appropriately.

What content do you cover and how is this delivered over time?

The TWT curriculum covers the National Curriculum and beyond split into five key areas: Number, Algebra, Geometry, Ratio & Proportion and Data Handling. Each of these areas is covered several times over the course of key stage 3 and 4 to ensure that pupils regularly revisit and progressively extend their knowledge in each area simultaneously. This encourages pupils to gain confidence with each topic in incremental steps and the regular data cycles provide opportunities for them to reflect on their learning and set targets for future improvement.

How do you sequence the curriculum so that new knowledge and skills builds on what has been taught before?

Topic specific powerful knowledge is taught concurrently to Year 7, 8 and 9 allowing students to recall prior knowledge and give teachers expert insight into where the knowledge has come from and where it is leading to. For example, linear equations is taught at the same time in 7,8 and 9 so that teachers are acutely aware of the prerequisite knowledge as well as the depth of the topic moving forward. The order of topics throughout the curriculum is considered carefully to ensure that topics can be interleaved throughout. There is a strong focus on number and algebra at the beginning of each academic year so that threshold concepts are consistently revised and revisited for future learning. Students all learn the same content regardless of ability from Yr 7 – 10. Only then is tiered content considered.

Year 11

CYCLE 1
Bespoke revision plans for individual classes.

CYCLE 2
Bespoke revision and GCSE exams

CYCLE 3
Geometry: Constructions; Pythagoras and trigonometry; transformations
Data handling: Averages; Probability trees and Venn

CYCLE 1
Number: bounds and laws of indices; standard form
Algebra: Graphing; Quadratics

Year 10

CYCLE 2
Number: Fractions and surds; percentages
Algebra: Formulae; plotting inequalities
Ratio: Combining ratio; direct and inverse proportion; compound measures.

CYCLE 3
Geometry: Angles in parallel lines; 2D compound shapes3D shapes
Data handling: Averages; displaying data; probability

CYCLE 1
Number: prime factors; estimation, negative numbers
Algebra: Algebraic manipulation; sequences

Year 9

CYCLE 2
Number – types or; fractions and percentages

Algebra: Solving linear equations

Ratio: Fraction calculations, simplification and sharing, applications of number and ratio

CYCLE 3
Geometry: angles and 2D shapes

Data handling: Averages and spread; displaying data; probability

CYCLE 1
Number: the foundations of number on which to build on
Algebra: An introduction to algebra in secondary school

Year 8

CYCLE 2
Number: Roots and Indices; fractions, percentage multipliers

Algebra: Solving equations and inequalities

Ratio: Ration proportion and scale; compound measures.

Year 7

Future careers in mathematics

engineering; meteorology; accountancy; banking and finance; business; IT; research; teaching; sports statistics, astronomy, surveying, software development

Enrichment Opportunities

EMC² - KS3 TWT Maths competition
UKMT – Junior, Intermediate and Senior Maths challenges. Group maths challenges
EMS – workshops and Saturday school Statistics and Further Maths GCSE offer
Maths mentoring - Older students mentoring younger students across the school in mathematics.
Primary School Competitions – working with local primary schools to offer enrichment activities

Sparx Learning

All Trust schools use Sparx learning as a homework package. It is expected that all student complete 100% of their homework each week and are supported by the school to do so. The retrieval based tasks are a crucial part of students retrieval. All schools should have a clear Sparx policy that outlines how students are supported in achieving our high expectations.

		Week	Year 7	Year 8	Year 9
Autumn Term	Number	1	Factors and Multiples	Prime factors, HCF and LCM	HCF and LCM problems
		2	Place Value and Rounding	Estimation	Upper and Lower Bounds
		3	Mental and Written Methods	Operations with decimals	Laws of indices, negative, fractional
		4		Mental and Written Methods (Applied)	
		5	Negative Numbers	Negative Numbers	Standard Form
		6	Time	Reading timetables	Straight Line Graphs
	Algebra	7	Algebraic Notation	Coordinates and graphs	
		8	Algebraic Manipulation including Expanding Single Brackets	Algebraic Manipulation including Expanding and Factorising Brackets	Quadratic Expressions
		9			
		10	Patterns and Sequences	Linear Sequences	Quadratic Sequences
Spring Term	Number	1	Types of Number (inc. powers)	Roots, Indices and Surds	Fractions and Surds
		2	Fractions	Fractions and mixed numbers	
		3		Operations with mixed numbers	Percentages
		4	Percentage of amounts	Percentage multipliers	
	Algebra	5	Solving Linear Equations	Solving equations with variables on both sides	Rearranging formulae
		6			
		7		Inequalities (solving)	Plotting regions with inequalities
	Ratio	8	Fraction Calculations	Ratio, proportion and scale	Combining ratios
		9	Simplify and share		Direct and inverse proportion
		10	Applications	Compound Measures	Compound Measures
Summer Term	Geometry	1	Properties of lines , angles and 2D shapes	Interior and Exterior Angles	Constructions
		2	Angles	Parallel lines	Pythagoras and Trigonometry
		3		2D Compound Shapes - Circles	
		4		2D Shapes - Area and perimeter	
		5	2D Shapes - Area and Perimeter	3D shapes (properties, volume and surface area)	Transformations
		6			
	Data Handling	7	Averages and spread (raw data)	Averages and spread (problems)	Averages from frequency tables (simple and grouped)
		8	Tally charts, Bar Charts, Pictograms, Stem and leaf	Scatter Graphs and Pie Charts	
		9		Probability - Sample Space, Two Way Tables and Frequency Trees	Probability - Tree and Venn
		10	Probability		