Thomas Mills
High School & Sixth Form

CURRICULUM OVERVIEW: Mathematics

At Thomas Mills, our Key Stage 3 Mathematics curriculum is designed to build strong foundations in mathematical knowledge, understanding, and skills, ensuring that every student is well-prepared for the challenges of Key Stage 4 and beyond. We aim to nurture confident, curious and resilient learners who see mathematics as an essential tool for understanding and interpreting the world around them.
Our intent is for all KS3 pupils to:

- **Secure fluency** in core mathematical concepts through regular practice and varied application, enabling them to recall and use knowledge accurately and efficiently.
- **Develop mathematical reasoning** by exploring patterns, making conjectures and using precise language to explain and justify their thinking.
- **Apply their skills to problem-solving** in a range of contexts, encouraging resilience, creativity and the ability to break down complex problems into manageable steps.

The KS3 curriculum is carefully sequenced to progressively deepen understanding, close knowledge gaps, and build connections across different areas of mathematics. It provides opportunities for all learners to experience success, regardless of their starting point, through appropriately challenging and engaging activities.
We are committed to promoting a positive attitude towards mathematics by:

- Demonstrating its relevance in everyday life and future careers.
- Providing enrichment opportunities and encouraging mathematical curiosity.
- Supporting pupils to develop the confidence to tackle unfamiliar problems with perseverance.

By the end of Key Stage 3, our pupils will have the secure knowledge, skills and self-belief needed to approach GCSE Mathematics with confidence, ambition and a genuine appreciation for the subject.

Year 8

Term	Topic	Knowledge and Skills	Useful Links
1	**Factors and Multiples**	**Knowledge and Skills:** Pupils will learn to: • recognise prime numbers	MyMaths Dr Frost Maths

		• express a composite number as a product of its prime factors • represent the prime factorisation of a number in index notation • find the highest common factor (HCF) of a group of numbers by using prime factorisation • find the lowest common multiple (LCM) of a group of numbers by using prime factorisation • understand the use of prime factorisation to find the square root and cube root of a number	Prime numbers, factors and multiples - KS3 Maths - BBC Bitesize Understanding factors, factor pairs and multiples in Maths - BBC Bitesize Properties of number: factors, multiples, squares and cubes KS3 | Y7 Maths Lesson Resources | Oak National Academy
	Approximation and Esimation	• round numbers to a required number of decimal places • round numbers to a required number of significant figures • estimate quantities (numbers and measures) to an appropriate degree of accuracy • estimate the results of computation • be aware of rounding errors in the intermediate steps of calculations	MyMaths Dr Frost Maths Rounding and estimating - KS3 Maths - BBC Bitesize How to use estimation to check your answers - BBC Bitesize Estimation and rounding KS3 | Y8 Maths Lesson Resources | Oak National Academy
	Ratio, Rate and Speed	• use ratio notation • compare quantities by ratio • describe the relationship between ratio and fraction • divide a quantity in a given ratio • solve problems involving ratio • understand and use the scale of a map or plan • solve problems involving rate in daily life • recognise the relationships between distance, time and speed	MyMaths Dr Frost Maths Working with proportion - BBC Bitesize Calculating speed, distance and time KS3 | Y8 Maths Lesson Resources | Oak National Academy

		• write speed in different units and convert it from one unit to another • recognise the concepts of constant speed and average speed • solve problems involving speed	
	More Percentages	• express a percentage as a fraction or a decimal • express one quantity as a percentage of another • compare two quantities by percentage • recognise percentages greater than 100% • calculate simple interest • solve problems involving reverse percentage • calculate percentage increase and decrease in quantities	MyMaths Dr Frost Maths Percentages - KS3 Maths - BBC Bitesize Percentages of an amount - BBC Bitesize Understanding multiplicative relationships: percentages and proportionality KS3 | Y8 Maths Lesson Resources | Oak National Academy
Assessments		At the end of each unit, pupils will complete a written assessment designed to evaluate their understanding of the key concepts, methods and problem-solving skills covered throughout the unit. These assessments provide an opportunity for pupils to demonstrate their mathematical thinking, fluency and application of knowledge in a range of contexts.	
2	**Algebraic Expressions, Formulae and Proof**	**Knowledge and Skills:** Pupils will learn to: • use letters to represent numbers or variables • interpret algebraic notations • evaluate algebraic expressions and formulae • express real-world situations in algebraic terms • simplify linear expressions • prove a statement algebraically	MyMaths Dr Frost Maths Algebra - GCSE Maths - BBC Bitesize Expressions and formulae KS3 | Y9 Maths Lesson Resources | Oak National Academy MyMaths

	Equations and Inequalities in One Variable	• understand the concepts of equations and the solution of an equation • solve linear equations in one variable • solve linear equations in one variable involving brackets • formulate linear equations in one variable to solve problems • understand the concepts and properties of linear inequalities	Dr Frost Maths Solving equations and inequations - Working with linear equations and inequations - National 5 Maths Revision - BBC Bitesize Forming and solving inequalities KS3 | Y8 Maths Lesson Resources | Oak National Academy MyMaths
	Coordinates and Linear Functions	• construct the Cartesian coordinate system in two dimensions and state the coordinates of points on it • recognise the idea of functions • plot a graph of a set of ordered pairs as a representation of a relationship between two variables • recognise linear functions in the form of $y = mx + c$ and draw their graphs • find the gradient of a linear graph	Dr Frost Maths Straight line graphs - BBC Bitesize Plotting coordinates KS3 | Y7 Maths Lesson Resources | Oak National Academy MyMaths
	Number Patterns	• recognise number patterns and sequences • find terms of a sequence using a term-to-term rule • recognise arithmetic and geometric sequences • find terms of a sequence using a position-to-term rule • find the formula for the general (nth) term of an arithmetic sequence • solve problems involving number patterns and sequences	Dr Frost Maths What are geometric sequences? - BBC Bitesize Sequences KS3 | Y8 Maths Lesson Resources | Oak National Academy

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3	**Angles in Quadrilaterals and Polygons**	**Knowledge and Skills:** Pupils will learn to: • classify special quadrilaterals on the basis of their properties • recognise the properties of special quadrilaterals • recognise the properties of polygons, including symmetry properties	MyMaths Dr Frost Maths Angles - KS3 Maths - BBC Bitesize How to identify different polygons - BBC Bitesize Lesson: Angles in quadrilaterals | Oak National Academy
	Perimeter and Area of Parallelograms and Trapezia	• calculate the area of a parallelogram • calculate the area of a trapezium • solve problems involving perimeters and areas of composite plane figures	MyMaths Dr Frost Maths Perimeter, Area, Volume - KS3 Maths - BBC Bitesize Area of a trapezium KS3 | Y7 Maths Lesson Resources | Oak National Academy Perimeter, area and volume KS3 | Y8 Maths Lesson Resources | Oak National Academy
	Volume and Surface Area of Prisms and Cylinders	• visualise and draw sketches of three dimensional shapes from different views • visualise and draw the nets of prisms and cylinders • calculate the volume and surface area of prisms • calculate the volume and surface area of cylinders	What are the properties of 3D shapes? - BBC Bitesize Volume of prisms and cylinders KS3 | Y8 Maths Lesson Resources | Oak National Academy Prisms and cylinders KS3 | Y8 Maths Lesson Resources | Oak National Academy

	Statistical Graphs	• convert between cm^2 and m^2, and between cm^3 and m^3 • solve problems involving volume and surface area of composite solids • construct, analyse and interpret line graphs • construct, analyse and interpret pie charts • describe the purposes and appropriateness of use of the different forms of statistical representation, including pictograms and bar charts • explain why a given statistical diagram can lead to misinterpretation of data • construct, analyse and interpret scatter graphs • describe types of correlation for a scatter graph • draw a line of best fit on a scatter graph and use it to estimate data values • find the equation of a given line of best fit • identify and explain outliers	Pie charts - KS3 Maths - BBC Bitesize Pie charts - Presenting data - graphs, charts and diagrams - 3rd level Maths Revision - BBC Bitesize Graphical representations of data KS3 | Y8 Maths Lesson Resources | Oak National Academy
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