



At Thomas Mills, our Key Stage 4 Mathematics curriculum is designed to equip pupils with the knowledge, skills, and confidence required to succeed in their GCSE examinations and beyond. We aim to develop mathematically fluent, logical, and independent learners who can apply their understanding to solve problems in both familiar and unfamiliar contexts.

Our intent is for all KS4 pupils to:

- **Master key mathematical concepts and techniques** with accuracy and efficiency, ensuring strong fluency across all areas of the GCSE syllabus.
- **Develop sophisticated mathematical reasoning** by constructing clear, logical arguments and critically evaluating mathematical information.
- **Apply their mathematics confidently to solve complex problems**, demonstrating creativity, perseverance, and the ability to interpret and model real-world situations.

The KS4 curriculum is structured to build on prior knowledge from KS3, consolidating and extending skills with increasing challenge. It provides a balanced approach between procedural fluency, conceptual understanding and problem solving, ensuring pupils are well-prepared for both foundation and higher-tier GCSE examinations.

We strive to foster a positive and resilient mindset by:

- Emphasizing the relevance of mathematics in everyday life, higher education, and careers.
- Encouraging independent learning, self-reflection, and continuous improvement.
- Providing targeted support and stretch opportunities to meet the needs of all learners.

By the end of Key Stage 4, pupils will be confident, competent mathematicians ready to progress to further study or employment, equipped with the mathematical skills essential for success in the modern world.

Year 9

Term	Topic	Knowledge and Skills	Useful Links
1	Unit 1 – basic number	Knowledge and Skills: Pupils will learn: • how to calculate with integers and decimals	



		• how to round numbers to a given number of significant figures • how to work out and recognise multiples, factors, prime numbers and squares, cubes and their roots • how to find the prime factors of a number • how to work out lowest common multiples (LCM) • how to work out highest common factors (HCF) • how to calculate with negative numbers	Highest common factor and lowest common multiple - Multiples and factors - Edexcel - GCSE Maths Revision - Edexcel - BBC Bitesize Lesson: HCF or LCM Oak National Academy
	Unit 2 – Fractions, ratio and proportion	• how to work out one quantity as a fraction of another • how to add, subtract, multiply and divide fractions with and without a calculator • how to use a percentage multiplier • how to work out percentage increase and decrease • how to work out one quantity as a percentage of another.	Lesson: Decimal multiplier method to find percentages of an amount Oak National Academy Percentages KS4 Y10 Maths Lesson Resources Oak National Academy Percentages of an amount - BBC Bitesize
	Unit 3 – Statistical diagrams and averages	• how to draw and interpret pie charts • how to draw and interpret line graphs • how to solve problems that use averages • how to calculate averages from frequency tables • how to draw scatter diagrams and lines of best fit	Draw and interpret pie charts Core KS4 Y11 Maths Lesson Resources Oak National Academy Averages (From a list and tables, Stem and Leaf) KS4 Y10 Maths Lesson Resources Oak National Academy
		• how to recognise rules for sequences	



	Unit 4 – Number and sequences	• how to express a rule for a sequence, in words and algebraically • how to generate the terms of a linear and quadratic sequence, given a formula for the nth term • how to find the nth term of a linear and quadratic sequence • some common sequences of numbers	Higher Maths questions - Modelling situations using sequences - Higher Maths revision - BBC Bitesize Quadratic sequences Higher KS4 Y11 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	Unit 5 – Ratio and proportion Unit 6 – Angles	Knowledge and Skills: Pupils will learn: • how to divide an amount according to a given ratio • how to solve problems involving direct proportion • how to compare prices of products • how to calculate compound measures (rates of pay, speed, density, pressure) • how to calculate compound interest and repeated percentage change • how to calculate a reverse percentage • how to find angles on a line and around a point • how to find angles in a triangle and in any polygon	Working with proportion - BBC Bitesize Direct and inverse proportion KS4 Y11 Maths Lesson Resources Oak National Academy Repeated percentage change, interest and exponential change - BBC Bitesize Simple and compound interest Higher KS4 Y10 Maths Lesson Resources Oak National Academy Triangles - Angles, lines and polygons - Edexcel - GCSE Maths Revision - Edexcel - BBC Bitesize



	Unit 7 – Transformations, constructions and loci	• how to calculate angles in parallel lines • how to calculate interior and exterior angles in polygons • how to read scale maps and drawings • how to use bearings • how to show that two triangles are congruent • how to find the order of rotational symmetry of a 2D shape • what is meant by a transformation • how to translate, reflect, rotate and enlarge 2D shapes • how to bisect a line and an angle • how to construct perpendiculars • how to define a locus • how to solve locus problems • how to construct and interpret plans and elevations of 3D shapes	Angles KS4 Y10 Maths Lesson Resources Oak National Academy Lesson: Polygons and triangles Oak National Academy Constructions & Loci KS4 Y11 Maths Lesson Resources Oak National Academy Advanced problem solving with loci and constructions Higher KS4 Y11 Maths Lesson Resources Oak National Academy Loci - Loci and constructions - AQA - GCSE Maths Revision - AQA - BBC Bitesize Factorising a quadratic expression Higher KS4 Y10 Maths Lesson Resources Oak National Academy Checking and securing understanding of the product of two binomials Higher KS4 Y10 Maths Lesson Resources Oak National Academy
	Unit 8 – Algebraic manipulation	• how to substitute numbers into expressions and formulae • how to simplify expressions by collecting like terms • how to expand and factorise expressions • how to expand two or more binomials • how to factorise quadratic expressions • how to rearrange formulae	



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.	
3	Unit 9 – Length, area and volume	Knowledge and Skills: Pupils will learn: • how to calculate the circumference and area of a circle • how to calculate the area of a parallelogram and a trapezium • how to calculate the length of an arc • how to calculate the area and angle of a sector • how to calculate the volume of a prism and a pyramid • how to calculate the volume and surface area of a cylinder, a cone and a sphere	Parts of a circle - Sector, segment and arc - Higher only – WJEC - GCSE Maths Revision - WJEC - BBC Bitesize Sector area - Circles, sectors and arcs - AQA - GCSE Maths Revision - AQA - BBC Bitesize https://thenational.academy/pupils/lessons/calculating-arc-length?share=true 2D and 3D shape: surface area and volume (pyramids, spheres and cones) KS4 Y11 Maths Lesson Resources Oak National Academy
	Unit 10 – Linear Graphs	• how to draw a straight-line graph from its equation • how to find the equation of a linear graph • how to read information from a conversion graph	Gradients - Intermediate and Higher tier - Equations of lines – WJEC - GCSE Maths Revision - WJEC - BBC Bitesize Linear graphs KS4 Y10 Maths Lesson Resources Oak National Academy



	Unit 11 – Right-Angled Triangles	• how to use graphs to find formulae and solve simultaneous linear equations • how to draw linear graphs parallel or perpendicular to other lines • how to use Pythagoras' theorem in right-angled triangles • how to use Pythagoras' theorem to solve problems • how to use Pythagoras' theorem in three dimensions • how to use trigonometric ratios in right-angled triangles • how to use trigonometry to solve problems	Calculating the hypotenuse - Pythagoras' theorem - Intermediate & Higher tier - WJEC - GCSE Maths Numeracy (WJEC) Revision - BBC Bitesize Pythagoras' theorem - BBC Bitesize Right-angled trigonometry KS4 Y10 Maths Lesson Resources Oak National Academy
Assessment	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.		