Marshland Curriculum Overview 2023-2024

Mathematics

Curriculum Intent
Marshland High School's maths curriculum is focused on the mastery for maths approach. A spiral curriculum, it reviews prior learning at KS2 and builds on this knowledge, year on year through KS3 (Y7 - Y9) and KS4 (Y10 & 11). Our intention is to develop student understanding of mathematical concepts and structures, alongside providing sufficient practice to attain fluency. Year group sequencing of schemes of learning aims to ensure solid building blocks within maths whilst also introducing new ideas to ensure interest and depth of understanding. Content is carefully chosen to give pupils confidence to use the skills they learn within other curriculum areas, such as science, geography and food, as well as real life maths situations. Applying correct mathematical language and terminology is a key focus area, giving students fundamental tools to communicate their reasoning, thinking and ideas, accurately and precisely. The Marshland maths curriculum is a living document, encapsulating the department's philosophy and practice of continual evaluation, analysis and improvement. Our curriculum is continuously evaluated as a department and as a Trust, and changes are made if necessary. It therefore reflects the needs of the current students.

How does our curriculum build upon previous learning?	
KS3	The national KS2 maths curriculum covers basic knowledge and skills required to ensure foundations are established for KS3 learning. KS2 'ready for progress criteria' is divided into six key strands: number and place value, number facts, addition & subtraction, multiplication & division, fractions and geometry. In KS2 is students learn approaches and techniques, providing the required core skills to successfully access and continue their maths journey in KS3 and KS4. For example, in KS2 students learn concrete techniques for addition, subtraction, multiplication and division. Without these KS3 would become inaccessible. Our KS3 curriculum builds on the six key strands established in KS2. For example, in Y7 we develop understanding of addition & subtraction through the introduction of averages, algebra and shape, likewise for multiplication & division. At all stages we consider prior learning and depth of understanding already achieved by our primary feeder schools, which is often slightly behind the national average. Teaching must be pitched at the correct level, to ensure students are neither bored by repeating content they fully understood in KS2, nor struggle with content which they cannot access with their existing knowledge. At the start of each topic a diagnostic test is used to facilitate teacher's pitch. This is further achieved in KS3 and KS4 through regular assessment: low stakes quizzes, questioning, retrieval practice, multi choice questioning and topic tests. Within the KS3 and KS4, we also focus on modelling, encouraging the use of correct mathematical language in order to build confidence. By the end of KS3, students should be fluent in the objectives covered, as well as applying their skills to a variety of problems and justifying reasons for their answers. They should have a secure understanding of the foundations of mathematics that underpin the GCSE course in Y10 and Y11.

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How does our curriculum build upon previous learning?	
KS4	Our KS4 curriculum is linked to the exam specification for mathematics whilst building on KS3. Learning is split into two tiers for students, higher and foundation, meaning the KS4 curriculum follows two pathways, with individual students placed on the pathway most appropriate to their learning journey. Throughout KS4, KS2 strands are further built upon. For example, further developing depth of understanding in addition & subtraction by focusing on problem solving, reverse & inverse questions and wordy questions, to secure fluency and reasoning skills. KS4 curriculum sequencing is designed to facilitate prior learning checks and retrieval whilst introducing new mathematical areas and concepts required from the exam specification.

What do students *do* with this knowledge or these skills?	How do we help students secure this knowledge in long-term memory?
Students use knowledge and skills in a variety of activities within lessons: ● Questions ● Puzzles ● Mathematical calculation questions ● Matching activities ● Fill in the gaps ● Odd one out tasks ● Problem solving ● True & false or same & different activities	Securing knowledge in long term memory is the vital goal of our course, in fact, it is by our definition, learning. Some examples of how we achieve this are listed below. It is crucial to note that this is not a tick list and not all of these (or perhaps any of them) will be observed in a given lesson. Maths teachers will use these, as appropriate, to the context of what they are teaching. ● Quizzing for memory retrieval practice, both in lessons and homework ● Interleaving questions from different topics and asking questions of incrementing demand ● Targeted questioning in class that supports pupils in engaging in retrieval practice ● Teaching with visual/physical aids then removing to abstract form e.g. manipulatives, bar models ● Diagnostic tests ● Question level analysis of tests giving specific, targeted areas of development

How does our curriculum align to the national curriculum?
We cover the ambition of the national curriculum by following a mastery curriculum which studies topics in depth, rather than breadth. Our curriculum takes the KS2 objectives and builds upon them. Students cover in greater depth whilst also learning new KS3 in small steps, linking new content to secure existing knowledge, as well as interleaving where possible.

How do we check student understanding and monitor progress?
Understanding is checked regularly within lessons through: ● regular retrieval quizzing and low stakes testing ● use of whiteboards to ensure all students are providing a response to identify gaps quickly ● targeted hands-down questioning with a 'no-opt out' policy This allows teachers to have a good understanding of their pupils and their needs. Misconceptions can be addressed quickly before they become concreted into the long-term memory. In addition, summative assessments are used in the form of multiple-choice diagnostic quizzes and end of topic unit tests. The end of topic unit test checks ability of students to show core skills and apply knowledge in different contexts. The outcomes from the summative assessments are then used to identify the need for group or individual interventions.

Curriculum sequencing			
Year	**Autumn**	**Spring**	**Summer**
7	**Consolidation of KS2** Sequences intro, place value, addition and subtraction, multiplication and division Factors & multiples, primes & indices, order of operations	Geometry: properties of shapes and angles, fractions, algebraic expressions, percentages	Rounding and estimation, algebraic expressions, Linear equations
8	**Consolidation of Year 7** Linear equations, angles, area and perimeter, percentages, ratio & proportion, fractions	2D geometry, 3D geometry, Statistics, probability, percentages	Algebraic expressions, linear equations, Consolidation
9	Percentages, standard form, Algebra - Recap & Index laws, ratio & proportion, sequences, straight line graphs	Real life graphs, transformations, Inequalities, Quadratic expressions, Quadratic graphs	Probability, right-angled triangles – Pythagoras & trigonometric ratios, Surds (Higher ability only)

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Curriculum sequencing			
Year	**Autumn**	**Spring**	**Summer**
10	**Foundation -** Ratio, pythagoras & trigonometry - Recap & extend, sampling, averages, charts and graphs, pie charts, scatter graphs, properties of shapes, parallel lines and angle facts, interior & exterior polygon angles **Higher -** Indices and roots, surds, recurring decimals to fractions, linear graphs and coordinate geometry, surds, quadratic equations and expressions, simultaneous equations, direct and inverse proportion, averages	**Foundation -** Quadratic equations, expanding and factorising and graphs, perimeter and area, 3D forms - surface area and volume, compound measures **Higher -** Sampling, averages, charts and graphs, pie charts, scatter graphs, properties of shapes, parallel lines and angle facts, interior and exterior angles of polygons, Pythagoras theorem and trigonometry in right angled triangles, perimeter and area	**Foundation -** Probability, simultaneous equations, perimeter, area and volume, similarity and congruence **Higher -** Surface area and volume, accuracy and bounds, constructions, loci and bearings, probability, compound measures, similarity and congruence, cumulative frequency and box plots, Further trigonometry, vectors
11	**Foundation -** Similarity and congruency, trigonometry, vectors, straight line graphs, simultaneous equations, bounds, proof **Higher -** Quadratic inequalities, sequences – quadratic, circle theorems, geometry – circles, inequalities – graphing, transformations of graphs	**Foundation -** Revision **Higher -** Algebraic fractions, changing the subject where the subject occurs more than once, proof, functions, gradient and area under a curve, iteration, growth & decay	**Foundation -** Revision **Higher -** Revision
Rationale for this sequencing	Our KS3 and KS4 curriculum is a research-informed knowledge-rich curriculum, with a sequence of lessons that ensures pupils continuously build on their current knowledge. For example, in Y7 we ensure addition and subtraction are fully covered ready for completing perimeter in Y8, which involves these core skills. We aim to ensure all pupils become fluent in the fundamentals of mathematics, by developing conceptual understanding, as well as the ability to recall and apply knowledge rapidly and accurately. Students need to reason mathematically by following a line of enquiry, conjecturing relationships and generalisations, to develop an argument, justification or proof using mathematical language. A focus on instilling independence and problem-solving skills is a key area in the mastery for maths approach. Mathematics is a cyclical subject and many topics are revisited during KS3 & KS4.		

How does this curriculum prepare students for the transition to post-16 pathways?
Many students from Marshland High School progress on to maths related courses. Some students that study the higher KS4 curriculum will move into sixth form courses studying A Level Maths, Further Maths and Physics. GCSE knowledge and skills are directly built upon in KS5 and we focus on teaching methods that will be used at this level in our higher curriculum. The first maths A level modules relate back to fundamental knowledge from KS4, for example, factorising quadratic equations using the correct technique to succeed. Some students attend college or complete apprenticeships in: Engineering, Accounting/Finance, Computer science/technology, Statistics, Business studies & data management to name a few. Knowledge secured in maths at both KS3 and KS4 supports understanding and problem-solving, helping students progress in these courses.