Mathematics on a Page 2024 / 2025

Mathematics

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CURRICULUM INTENT:

The purpose of the mathematics curriculum is to provide a secure understanding of mathematical concepts, from basic principles of mathematics to complex topics that combine several areas of study into a single question. The curriculum promotes retention of knowledge and a depth of learning rather than an accelerated curriculum, resulting in pupils who are confident in taking their studies further into sixth form, university and beyond.

In all year groups, there is an intentional focus on numeracy which will support pupils not only in their study of mathematics but will also enable them to access mathematical questions in other subjects.

Mathematics on a Page 2024 / 2025

Key Stage 3

Year 7

All teachers have the autonomy to combine or separate the shared resources to fit their pupils' needs. However, we do expect all lessons to follow a similar pattern. This pattern links directly to the Rosenshine Principles.

Do now' activity:

• Mixed fluency skills based on pre-requisite knowledge presented in a structured starter grid

• Self-assessed answers should be pre-prepared to increase the pace and ease the transition to the next part of the lesson

• Poorly answered questions should appear in the next starter

Introduction of new skills:

• Carefully chosen examples that are modelled in detail without whole class questioning

• Students complete a similar example to the modelled example

• Then ask targeted questions to check understanding

Check for understanding:

• Check the understanding of examples – this could be in books, on MWB, with questioning and/or purposeful circulation

• Re-model questions that were not understood

Independent practice:

• Independent practice informed by AFL i.e. mini quiz, targeted questions

• Independent practice that relates directly to the modelled examples

• Enough time is given for students to complete questions with minimal copying out

• Problem-solving questions will follow when the fluency is secure

Review of independent practice:

• Answers given to independent practice (prepare answers and minimise pupil input to increase the pace and maximise the clarity of answers)

• Students self-assess their work (coloured pen)

Regular review:

• Use starters and regular quizzing to review knowledge taught

Term 1	Numerical Skills, Order of operations, Introduction to Algebra,	Term 2	Primes Factors and Multiples, Expanding and Factorising 1, Addition and Subtraction, Perimeter	Term 3	Mean, Multiplication and Division, Areas of Triangles and Quadrilaterals	Term 4	Fraction Manipulation, Adding and Subtracting Fractions, Comparing and Ordering Fractions, Fractions of amounts	Term 5	Polygons, Angles, Coordinates	Term 6	Time

In our planning, we have asked ourselves 'why this, why now?' Here we provide some examples of the curriculum choices we have made, and why the units have been placed in the order we have chosen:

• Perimeter and angles are taught following addition and subtraction so that pupils have the skill set needed to access the numeracy demands of these topics.

• Area and substitution are taught following multiplication and division so that pupils have the skill set needed to access the numeracy demands of these topics.

• Algebraic manipulation is taught in-depth in Year 7 to support solving equations in Year 8.

• Fraction and decimal manipulation are taught early in Year 7 and are then continually interleaved into future topics such as order of operations, linear equations, and circumference.

• Solving linear equations is taught in-depth in Year 8 and then it is continually interleaved into future topics such as angles in parallel lines.

• The Mean is taught in-depth in Year 7 before the introduction of the Median, Mode and Range in Year 8. This is to avoid misconceptions in the analysis of averages.

• Perimeter and area are taught separately with a suitable time gap to avoid misconceptions with these two mathematical areas.

Mathematics on a Page 2024 / 2025

Year 8	Term 1	Powers and Roots, Prime Factorisation, Rounding, Fractions	Term 2	Solving equations 1, Angles in Parallel Lines, Circumference	Term 3	Direct Proportion, Fractions decimals and percentages, Percentage calculations	Term 4	Ratio 1, Area of circlesDirect Proportion, Fractions decimals and percentages, Percentage calculations	Term 5	Statistics 1 (presenting and interpreting data), Averages and Spread	Term 6	3-D visualisation, Volume

Year 9	Term 1	Decimal Manipulation, Estimation and Limits of accuracy, Related Calculations, HCF & LCM of large numbers, Fraction Calculations	Term 2	Algebraic Manipulation, Index Laws, Standard Form, Expanding & Factorising 2	Term 3	Forming expressions & substitution, Direct and Inverse Proportion, Probability 1	Term 4	Solving equations 2, Inequalities 1, Sequences	Term 5	Solving equations 2, Inequalities 1, Sequences	Term 6	Plans and Elevations, Arcs and Sectors, Surface Area
	By Year 9 most students will have a firm understanding on numeracy skills which allow further exploration in to other topics. Previously learned skills in areas such as algebra and geometry are interleaved and built on, with more a focus towards GCSE style questions starting to be introduced. Students are often asked to retrieve previous content in "Do Now" tasks and assessments that cover the year so far.											

Mathematics on a Page 2024 / 2025

Key Stage 4

Year 10	Term 1	Foundation - Solving equations and rearranging formulae, Linear Graphs, Linear Simultaneous Equations, Volume 2. Higher -Rearranging formulae, Linear Graphs, Linear Simultaneous Equations, Volume 2	Term 2	Foundation - Compound Measures, Quadratics - graphical, Quadratics - algebraic, Further graphs. Higher - Compound Measures, Quadratics - graphical, Quadratics - algebraic, Further graphs	Term 3	Foundation - Probability 2, Statistics 2. Higher - Probability 2, Statistics 2, Cumulative Frequency and Box Plots, Standard Form	Term 4	Foundation - Ratio 2, Growth & Decay. Higher - Growth & Decay, Ratio 2, Ratio 3, Similar shapes	Term 5	Foundation - Pythagoras Review, Bearings & Scale Drawings. Higher - Algebraic proportion, Surds, Right angled Trigonometry	Term 6	Foundation - Review of the Year and Mock Prep. Higher - Bounds, Bearings and scale drawings, Transformations 2, Mock Prep
	The rationale behind the sequencing of topics in Year 10 GCSE Maths is to ensure a coherent progression that builds on prior knowledge, allowing students to deepen their understanding and apply mathematical concepts in increasingly complex ways. The sequence is carefully designed to support the curriculum intent, ensuring that foundational skills are mastered early so they can be applied in more advanced topics later in the course. Knowledge acquired in the first term is revisited and applied in subsequent terms. For instance, algebra introduced early on is crucial when studying linear graphs or quadratic functions later. Interleaving these concepts through regular "Do Now" tasks ensures that previous knowledge is kept fresh and students see connections across topics, improving retention and mastery. Towards the later stages, the sequencing aligns with the types of questions and skills assessed in the GCSE exam. This ensures that by the time students approach their exams, they are familiar with the full range of topics and question formats, having built a strong mathematical foundation throughout the year.											

Mathematics on a Page 2024 / 2025

Year 11

Targeted Support Based on Assessments: From the outset of Year 11, the curriculum is tailored using data from tests and mock exams to identify key areas where students need extra support. Gaps in knowledge, such as difficulties with algebra, geometry, or ratio, are addressed through targeted revision and intervention sessions. This personalized approach ensures that each student receives the specific help they need to improve.

Structured Revision and Cumulative Learning: The curriculum incorporates regular revision of core topics from both Year 10 and earlier Year 11 lessons. Topics are revisited and interleaved, allowing students to practice different areas of maths simultaneously, which strengthens long-term retention and enables them to see connections between concepts. This ensures a strong foundation in key topics such as algebra, statistics, and trigonometry.

Exam Preparation and Practice: A key focus of the Year 11 curriculum is preparing students for their GCSE exams. This includes regular exposure to exam-style questions, time-managed assessments, and past papers. Through this, students develop essential exam techniques, such as problem-solving, interpreting complex questions, and managing time effectively under exam conditions. These sessions are key to building confidence and competence in applying their knowledge.

Responsive Teaching and Flexibility: Teachers regularly assess student progress through mini-assessments, classwork, and mock exams, allowing for real-time adjustments to the curriculum. If a particular class or group of students demonstrates a common difficulty, lessons can be adapted to revisit and clarify those topics, ensuring no student falls behind.

Mock Exam Cycles and Feedback: As part of the exam preparation, students sit several mock exams during the year. Detailed feedback is provided, highlighting areas for improvement and giving students the opportunity to learn from their mistakes. Lessons following the mocks are structured to address common areas of weakness, further reinforcing the curriculum's focus on addressing knowledge gaps.

Intensive Revision Blocks: In the lead-up to exams, the curriculum transitions into focused revision periods. These blocks concentrate on practicing high-value exam topics, tackling common misconceptions, and refining techniques for solving more challenging questions.

By implementing the Year 11 curriculum with this focused, data-driven approach, students are given the tools and support they need to overcome weaknesses, master key mathematical concepts, and approach their final exams with confidence.

Term 1	Foundation - Algebra Review, Right angled Trigonometry, Similar shapes. Higher - Rearranging formulae, Linear Graphs, Linear Simultaneous Equations, Volume 2	Term 2	Foundation - Congruence, Constructions & Loci. Higher - Further Trigonometry, Inequalities 2, Functions	Term 3	Foundation - Gap Fill and Exam Prep. Higher - Iteration, Algebraic proof, Circle theorems, Histograms	Term 4	Foundation - Gap Fill and Exam Prep. Higher - Iteration, Algebraic proof, Circle theorems, Histograms	Term 5	Foundation - Gap Fill and Exam Prep. Higher - Gap Fill and Exam Prep.	Term 6	Year 11 New Knowledge will be complete by 24/3/2025 Year 11 Coursework deadline is 9/1/2024

The sequencing of topics in Year 11 GCSE Maths is strategically designed to address gaps identified from mock exams, consolidate prior learning, and prepare students thoroughly for their final assessments. This approach ensures that students strengthen weaker areas, while also refining exam techniques and deepening their understanding of key concepts.

Regular interleaving of topics, both through daily "Do Now" tasks and more in-depth revision sessions, helps students continuously revisit past material. This approach not only strengthens retention but also allows students to see connections between different areas of maths, fostering a deeper and more flexible understanding of the subject.

As the year progresses, the sequencing becomes more exam-oriented, with an emphasis on problem-solving, interpreting questions, and applying knowledge in unfamiliar contexts. Students engage with exam-style questions, past papers, and timed assessments to improve their fluency and confidence in tackling different question types.

Towards the end of the year, revision sessions focus heavily on exam technique—such as managing time, interpreting multi-step problems, and using appropriate methods. Practice exams and mock papers are key to preparing students not just for content but for the pressures of the exam setting.

Maths on a Page 2024 / 2025

Key Stage 5

Year 12

The Maths A Level curriculum begins with revisiting GCSE content, particularly Algebra, to build students confidence and understanding. Students are taught through teacher led modelling and are given time each lesson to complete independent practice. Homework is set each week to consolidate the learning from class. Regular assessments are completed to assess both learning of new topics and retention of previous work. These inform content for Do Now activities, as well as homework, and gives students a chance to work on exam technique. By the end of year 12, we have covered the Edexcel AS level specification.

Term 1	Algebraic Expressions Quadratics, Equations and Inequalities, Graphs and Transformations, Straight Line Graphs, Circles	Term 2	Algebraic Methods Differentiation, Integration, Vectors, Trigonometric Ratios, Trigonometric Identities and Equations	Term 3	Binomial Expansion, Data Collection, Measures of Location and Spread, Modelling in Mechanics, Constant Acceleration	Term 4	Representations of Data, Correlation, Probability, Forces and Motion	Term 5	Statistical Distributions, Hypothesis Testing, Variable Acceleration	Term 6	Revision, Mocks and Feedback. Start of year 13 curriculum

This gives students a chance to improve core Maths skills, particularly in Algebra. They then link back to these skills as they progress through the curriculum, both when applying these skills when learning new topics and revisiting them in Do Now activities and homeworks. Completing the Pure element first gives students a deeper level of understanding of these core skills, so they are more flexible in applying them in the applied areas of the curriculum.

Year 13

In year 13, we continue to implement the Edexcel specification, with topics introduced during Year 12 revisited and expanded. Each lesson begins with a Do Now activity to assess retention and understanding of previous topics, with a focus on high frequency exam topics and knowledge needed for the lesson.

There are regular assessments, assessing both content recently taught and previous content. This informs topics to include in Do Now activities, homework and content for revision sessions and lessons.

New teaching is complete at Easter, and a period of focussed revision follows until the exams in the summer. Revision is informed by performance in the mocks, as well as in class assessments. Students are given personal targets to improve upon, as well as tasks to complete to fill these gaps. Lesson time will be utilised to close common gaps in knowledge. Exam questions are used throughout the year, and during the revision period, past papers are used to build students exam technique.

After school revision is offered from the first term, to focus on content previously taught, which is open to all students.

Term 1	Algebraic Methods Sequences and Series, Binomial Expansion, Functions and Graphs, Radians, Trigonometric Functions	Term 2	Differentiation, Integration, Vectors, Trigonometric Modelling, Parametric Equations, Numerical Methods	Term 3	Moments, Forces and Friction, Projectiles, Regression, Correlation and Hypothesis Testing, Conditional Probability	Term 4	Applications of Forces, Further Kinematics, The Normal Distribution	Term 5	Revision and Exam Prep	Term 6	Year 13 New Knowledge will be complete by 7/4/2025

The sequence allows the Pure content to be delivered earlier in the year, which then allows more time for revision, and implement skills learned in the applied Maths chapters later on. Algebra and Graphical topics are in term 1 as content here is utilised in later chapters.