

MATHEMATICS CURRICULUM MAP – Links to Careers Education in PURPLE			
A. FORMAL KEY STAGE FIVE MATHEMATICS ADVANCED LEVEL CURRICULUM			
Core Threads	By the end of KS5 we want all students of MATHEMATICS to know and do the following key things: Communicates mathematical ideas by writing solutions in a logical, clear, concise and structured manner; identify efficient solution methods when problem-solving; recognise the use of calculus in the both the pure and applied mathematics; develop the ideas around the concept of proof.		
Prior Knowledge	In KS5, students of MATHEMATICS will build on the following prior learning : GCSE work on number (in particular indices work); algebra (in particular links to quadratics); ratio and proportion; trigonometry; statistics.		
Future Knowledge	The Curriculum in KS5 MATHEMATICS will prepare students for the following future learning : Becoming an independent student of Mathematics; able to consider taking Mathematics to degree level; available to take degrees with a high level of maths content, such as Medicine and Engineering.		
Year 12	Term	KEY KNOWLEDGE SKILLS CONCEPTS – TAUGHT, REVISED, REVISITED, AND LEARNT	Common Assessment End Points
	T1	Building the skills and knowledge for core topics: graphs & transformations. quadratics & co-ordinate geometry. Suggested career link – Computer Graphics Designer	Baseline Test at the start of the course Term 1 Core Knowledge and Skills Test
	T2	Introduction to core Mathematical areas and skills at Advanced Level: including differentiation & integration; algebraic methods including proof. Suggested career link – Computer Physicist	Term 2 Core Knowledge and Skills Test
	T3	Further embedding core Mathematical skills at Advanced Level. Suggested career link – Financial Analyst Gaining knowledge of: binomial expansion, exponentials and logs; vectors & statistical sampling.	Term 3 Core Knowledge and Skills Test
	T4	Focusing on sequences: arithmetic and geometric progressions and their applications. Developing knowledge and skills for data presentation & probability. Suggested career link – Biostatistician	Term 4 Core Knowledge and Skills Test
	T5	Developing knowledge and skills for statistical distributions, functions & modelling. Introduction to constant acceleration ('SUVAT') equations and forces. Suggested career link – Automotive Engineer	Term 5 Core Knowledge and Skills Test
	T6	Developing knowledge of mechanics further to include resolving forces. Introduce radians and further develop skills involving series and functions, extended to modelling situations. Suggested career link – Structural Engineer	Internal Interim Mock Examinations
Year 13	Term	KEY KNOWLEDGE SKILLS CONCEPTS – TAUGHT, REVISED, REVISITED, AND LEARNT	Common Assessment End Points
	T1	Explore regression, correlation, hypothesis testing and the normal Distribution and its application. Further embed knowledge of binomial expansion. Develop knowledge of differentiation further to include chain rule and product rule. Apply knowledge of radians and develop knowledge and skills for trigonometry. Suggested career link – Astronomer	Term 1 (Baseline) Core Knowledge and Skills Test
	T2	Further develop integration & differentiation skills, including connected rates of change and links to real life problems for differentiation. Investigate the applications of forces, including Newton's 2 nd Law. Progress to parametric equations.	Term 2 Core Knowledge and Skills Test
	T3	Revisit and embed the statistics work from earlier on in the course. Integration is further explored. Students are supported to develop an appreciation that not all functions are easy to integrate. Applications of Kinematics are investigated.	Term 3 Core Knowledge and Skills Test
	T4	Develop knowledge of further kinematics using calculus and variable acceleration problems. Numerical methods and further algebraic methods are explored. Suggested career link – Aerospace Engineer	Internal Interim Mock Examinations
	T5	Revision period including timed exam paper sessions to embed and consolidate their Mathematical skills thus far.	Examination Preparation Timed Past Papers External Examinations
B. WIDER KEY STAGE FIVE MATHEMATICS CURRICULUM			
- Senior Maths Challenge - M3 Challenge - Courses & trips for students to develop their higher-level problem-solving skills			

FURTHER MATHEMATICS CURRICULUM MAP			
A. FORMAL KEY STAGE FIVE FURTHER MATHEMATICS ADVANCED LEVEL CURRICULUM			
Core Threads	By the end of KS5 we want all students of FURTHER MATHEMATICS to know and do the following key things: Communicates by logical, clear, concise and structured manner; recognise the use of both the pure and applied mathematics; develop ideas around the concept of proof, strategies to develop problem solving, mathematical modelling.		
Prior Knowledge	In KS5, students of FURTHER MATHEMATICS will build on the following prior learning : GCSE work on number, algebra; ratio and proportion; trigonometry; statistics and motion; benefit (but not essential) to students who sat the Level 2 Further Maths course since this will have introduced a number of the key new topics covered in Further Maths.		
Future Knowledge	The curriculum in KS5 FURTHER MATHEMATICS will prepare students for the following future learning: Students will develop independent learning skills and demonstrate a wide range of problem-solving strategies; they will be able to consider taking Mathematics to degree level; available to take degrees with a high level of maths content, such as Medicine and Engineering.		
Year 12	Term	KEY KNOWLEDGE SKILLS CONCEPTS – TAUGHT, REVISED, REVISITED, AND LEARNT	Common Assessment End Points
	T1	Introducing the key skills and knowledge for Core Pure Further Maths, including complex numbers, argand diagrams, series and roots of polynomials. Suggested career link – Computer vision Engineer	Baseline Assessment Term 1 Core Knowledge and Skills Test
	T2	Understanding of matrices and linear transformations. Mathematical Proof and the range of techniques for mathematical induction. Use integration to find understand volumes of revolution. Suggested career link – Product Designer	Term 2 Core Knowledge and Skills Test
	T3	Investigate vectors further and extend students' knowledge of statistical distributions (including Poisson distribution) and discrete random variables. Suggested career link – Operations Analyst	Term 3 Core/Statistics Knowledge and Skills Test
	T4	Further focus on statistics with the geometric and negative binomial distributions and further hypothesis testing. Investigate mechanics topics involving momentum and impulse problems. Suggested career link – Epidemiologist	Term 4 Core/Statistics Knowledge & Skills Test
	T5	Develop statistics problem solving skills with Chi-squared tests and the central limit theorem. Introduce elastic collisions in 1 dimension. Suggested career link – Ballistics Expert	Term 5 Core/Statistics Knowledge & Skills Test
	T6	Finish the statistics topics through probability generating functions and investigations to assess the quality of any statistical tests. Extend understanding of complex numbers with De Moivre's theorem and series.	Internal Interim Mock Examinations
Year 13	Term	KEY KNOWLEDGE SKILLS CONCEPTS – TAUGHT, REVISED, REVISITED, AND LEARNT	Common Assessment End Points
	T1	Introduce further methods of calculus for both differentiation and integration. Further work on series to include Maclaurin series. Investigate work, energy & power problems, including those that involve strings and springs.	Term 1 Core/Applied Knowledge & Skills Test
	T2	Work on developing students understanding of calculus, further investigate volumes of revolutions problems. Extend understanding of elastic collisions by involving 2 dimensions. Introduce hyperbolic functions.	Term 2 Core/Applied Knowledge & Skills Test
	T3	Introduce the idea of polar co-ordinates and apply the use of calculus. Suggested career link – Navigation System Engineer Further work on core pure with an introduction to solving and modelling with 1 st and 2 nd order differential equations.	Term 3 Core/Applied Knowledge & Skills Test
	T4	Modelling with differential equations to solve real world problems. Suggested career link – Pharmacokinetics Analyst	Term 4 Core/Applied Knowledge & Skills Test
	T5	Revision period including timed exam paper sessions to embed and consolidate their Mathematical skills of the full course.	Examination Preparation Timed Past Papers External Examinations
B. WIDER KEY STAGE FIVE FURTHER MATHEMATICS CURRICULUM			
- Senior Maths Challenge - M3 Challenge - Courses & trips for students to develop their higher-level problem-solving skills			

MATHEMATICS CURRICULUM MAP			
A. FORMAL KEY STAGE FOUR MATHEMATICS GCSE LEVEL CURRICULUM			
Core Threads		By the end of key stage 4 we want all students to know and do the following key things: Recognise and use algebraic approaches when appropriate; communicate mathematical ideas by writing solutions in a logical, clear and structured manner; recognise and use the centrality of ratio and proportion to GCSE; check solutions	
Prior Knowledge		In KS4, students will build on the following prior learning : perform efficient, non-calculator arithmetic methods securely with integers, decimals and fractions, analyses problems and recognises key words and phrases and so can select an appropriate strategy	
Future Knowledge		The Curriculum in KS4 will prepare students for the following future learning : becoming independent students of Mathematics; and be in a position to consider taking Mathematics at Advanced Level.	
Year 10	Term	KEY KNOWLEDGE SKILLS CONCEPTS – TAUGHT, REVISED, REVISITED, AND LEARNT	Common Assessment End Points
	T1	Calculating with surds and indices. Developing existing algebraic skills, extending to algebraic fractions. Revisiting the properties of shapes, linking to angles. Suggested career link – Architectural Technician	Term One Core Knowledge and Skills Test
	T2	Revisiting previous work on handling data, then introducing new data representation e.g., histograms, cumulative frequency curves. Securing skills in working with fractions, decimals, and percentages. Revisiting linear graphs, including distance and midpoint between 2 points. Suggested career link – Surveyor	Term Two Core Knowledge and Skills Test
	T3	Developing further algebraic techniques with formulae and functions. Securing techniques for a range of transformations. Suggested career link – Game Developer	Term Three Core Knowledge and Skills Test
	T4	Securing techniques for compound measures and limits of accuracy. Solving quadratics using completing the square and the quadratic formula, and using these to interpret quadratic graphs. Suggested career link – Sound Engineer	Term Four Core Knowledge and Skills Test
	T5	Developing further algebraic techniques, securing the solution of linear and quadratic equations and inequalities. Linking algebraic solutions to graphs. Using iterative processes to solve equations. Suggested career link – Economist	Internal Mock Examination
	T6	Revisiting probability and developing deeper techniques. Use 3D shapes in a variety of situations including volume, surface area and similarity. Suggested career link – Product Packaging Designer	Term Six Core Knowledge and Skills Test
Year 11	Term	KEY KNOWLEDGE SKILLS CONCEPTS – TAUGHT, REVISED, REVISITED, AND LEARNT	Common Assessment End Points
	T1	Revisiting and developing ratio-based techniques. Revisiting trigonometry, introducing trigonometric graphs, vectors and geometric proofs. Suggested career link – Structural Engineer	Term One Core Knowledge and Skills Test
	T2	Developing existing knowledge of circles into more complex situations, including circle theorems. Developing problem solving skills. Suggested career link – Mechanical Engineer	Internal Mock Examinations: 3 Papers - the full GCSE experience
	T3	Developing calculations with surds, indices and standard form. Extending graphical knowledge to further functions and transformations. Introducing varying methods for conditional probability. Suggested career link – Astronomer	Past GCSE Paper
	T4	Exploring sequences and algebraic representations. Revisiting proportion in a variety of situations including graphical and algebraic. Suggested career link – Software Developer	Past GCSE Paper
	T5	Revision period including timed exam paper sessions to embed and consolidate their Mathematical skills thus far.	Past GCSE Paper
B. WIDER KEY STAGE FOUR MATHEMATICS CURRICULUM			
- Students are entered for the Intermediate Maths Challenge - Two teams are entered for the annual regional Year 10 team competition: The Maths Feast - Many students act as mentors for lower school students, often in support of their Duke of Edinburgh Qualification - Daily Maths Club - Courses & trips for students to develop their higher-level problem-solving skills			

FURTHER MATHEMATICS CURRICULUM MAP			
A. FORMAL KEY STAGE FOUR FURTHER MATHEMATICS CURRICULUM			
Core Threads		By the end of key stage 4 we want all students of Further Mathematics to know and do the following key things: Recognise and use algebraic approaches when appropriate; communicate mathematical ideas by writing solutions in a logical, clear and structured manner; recall GCSE content to build on; check solutions.	
Prior Knowledge		In KS4, students will build on the following prior learning : perform efficient, non-calculator arithmetic methods securely with integers, decimals and fractions, analyses problems and recognises key words and phrases and so can select an appropriate strategy.	
Future Knowledge		The Curriculum in KS4 will prepare students for the following future learning : become independent students of Mathematics; and be in a position to consider taking Mathematics and Further Mathematics at Advanced Level.	
Year 10	Term	KEY KNOWLEDGE SKILLS CONCEPTS – TAUGHT, REVISED, REVISITED, AND LEARNT	Common Assessment End Points*
	T1	Revisiting the laws of indices leading to solving equations with indices; revisiting polygons and angles, leading to an algebraic approach. Suggested career link – Urban Planner	Questions incorporated in Term One Core Knowledge and Skills Test
	T2	Developing algebraic skills. Revisiting linear graphs, securing applications of coordinate geometry. Exploring graphs of other functions. Suggested career link – Economist	Questions incorporated in Term Two Core Knowledge and Skills Test
	T3	Revisiting functions and introducing the idea of domain and range. Introducing binomial expansion with Pascal's triangle. Introducing matrices, including the zero matrix, identity matrix and transformations.	Questions incorporated in Term Three Core Knowledge and Skills Test
	T4	Introducing matrices, including the zero matrix, identity matrix and transformations. Revisiting solving quadratic equations and linking it to the factor theorem.	Questions incorporated in Term Four Core Knowledge and Skills Test
	T5	Introducing linear simultaneous equations with three unknowns. Developing skills with linear and quadratic equations.	Questions incorporated in Internal Mock Examinations
	T6	Securing volumes, such as pyramids, cones, and spheres, including answers in terms of π .	Questions incorporated in Term Six Core Knowledge and Skills Test
Year 11	Term	KEY KNOWLEDGE SKILLS CONCEPTS – TAUGHT, REVISED, REVISITED, AND LEARNT	Common Assessment End Points*
	T1	Solving trigonometric equations and linking to their graph. Introducing lines and planes in 3D. Suggested career link – Acoustical Engineer	Questions incorporated in Term One Core Knowledge and Skills Test
	T2	Introducing circle theorems, linking an algebraic approach where needed. Suggested career link – Mechanical Designer	Focus of Internal Mock Examination
	T3	Differentiation and linking it to a graph's gradient and stationary points; Developing the idea to find the equation of a tangent and normal at any point. Introducing the equation of a circle and developing the idea to where the circle centre is (a,b); Locate the equation of a tangent at a point on the circle. Suggested career link – CAD Technician	Separate Further Maths Term Core Knowledge and Skills Test
	T4	Revisiting nth term of a sequence and developing the idea to quadratic sequences and limiting the value of a sequence as $n \rightarrow \infty$. Suggested career link – Investment Analyst	Separate Further Maths Term Core Knowledge and Skills Test
	T5	Revision period including timed exam paper sessions to embed and consolidate their Mathematical skills thus far.	Past Paper
* Further Maths is offered to some students in KS4 and is taught in their ordinary timetabled lessons embedded into and alongside the content for GCSE Mathematics. The assessments in this column are additional assessments, completed in addition to those for GCSE Maths, for only those students on a Maths & Further Maths pathway			
B. WIDER KEY STAGE FOUR FURTHER MATHEMATICS CURRICULUM			
- Students are entered for the Intermediate Maths Challenge - Two teams are entered for the annual regional Year 10 team competition: The Maths Feast - Many students act as mentors for lower school students, often in support of their Duke of Edinburgh Qualification - Daily Maths Club			

MATHEMATICS CURRICULUM MAP			
A. FORMAL KEY STAGE THREE MATHEMATICS CURRICULUM			
Core Threads		By the end of key stage THREE we want all students of MATHEMATICS to know and do the following key things: Develop fluency in problem solving - to include an extended understanding of the number system, powers, roots and properties of numbers. Move freely between numerical, algebraic, graphical and diagrammatic representations. Use language precisely to analyse numbers, expressions, shapes, probability & statistics. Develop and use formal mathematical knowledge to interpret and solve multi-step problems; evaluate outcomes and assess the sensibility and suitability of an answer. Know when the structure of an algebraic, graphical, numerical or geometrical problem, requires additive, multiplicative or proportional reasoning.	
Prior Knowledge		In KS3, students of MATHEMATICS will build on the following prior learning : Solve number, practical problems that involve place value, and the four basic operations. Recognise the use of symbols and letters to represent variables and unknowns in mathematical situations. Solve problems involving mensuration and know how to tell if an answer seems sensible by estimating. Interpret charts, graphs, and averages, to help solve problems.	
Future Knowledge		The Curriculum in KS3 MATHEMATICS will prepare students for the following future learning : becoming confident students of Mathematics who are able to communicate their ideas clearly including using algebra, students have the skills necessary to succeed at GCSE level.	
Year 7	Term	KEY KNOWLEDGE SKILLS CONCEPTS – TAUGHT, REVISED, REVISITED, AND LEARNT	Common Assessment End Points
	T1	Understanding and calculating with negative numbers . Develop skills and understanding of algebraic expressions , leading into work with functions and sequences .	Term One Core Knowledge & Skills Test
	T2	Perimeter, area, & volume. Calculating with integers, decimals, squares & roots. Numerical problem solving. Introduction to data interpretation through a statistics project.	Term Two Core Knowledge & Skills Test
	T3	Forming and solving basic linear equations . Calculations and problem solving with fractions .	Term Three Knowledge & Skills Test
	T4	Calculating missing angles; recalling angle facts . Drawing straight line graphs . Solving problems with fractions, decimals and percentages .	Term Four Core Knowledge & Skills Test
	T5	Understanding probability , including sample space diagrams and relative frequency. Understanding symmetry and performing reflections and rotations.	Term Five Core Knowledge & Skills Test
	T6	Working with 3D shapes . Simplifying and sharing an amount into a ratio . Careers week lessons .	End of Year Examination
Year 8	Term	KEY KNOWLEDGE SKILLS CONCEPTS – TAUGHT, REVISED, REVISITED, AND LEARNT	Common Assessment End Points
	T1	Understanding factors, multiples , and primes. Forming and manipulating algebraic expressions. Applying percentage changes, exploring varying methods.	Term One Core Knowledge & Skills Test
	T2	Solving more advanced equations and rearranging formulae. Calculating with angles in parallel lines . Drawing transformations , enlargements and constructions. Understanding congruence. Surface area & volume of prisms.	Term Two Core Knowledge & Skills Test
	T3	Interpreting and drawing straight line graphs. Using standard form to represent large and small numbers. Calculating with standard form using all four operations.	Term Three Core Knowledge & Skills Test
	T4	Drawing and interpreting scatter graphs and understanding correlation. Problem solving with fractions. Multiplying and dividing with large and decimal numbers	Term Four Core Knowledge & Skills Test
	T5	Understanding numerical and graphical proportion , including in the context of map scales . Gaining an understanding of pi and using formulae associated with circles . Introduction to expanding and factorising.	Term Five Core Knowledge & Skills Test
	T6	Introduction to data interpretation with grouped frequency and misleading charts. Using Pythagoras to calculate missing lengths in right angled triangles. Calculating exterior and interior angles of polygons. Careers week lessons .	End of Year Examination

Year 9	Term	KEY KNOWLEDGE SKILLS CONCEPTS – TAUGHT, REVISED, REVISITED, AND LEARNT	Common Assessment End Points
	T1	Calculating forward and reverse percentage changes, including calculating interest. Manipulating algebraic expressions to be expressed as a quadratics or cubic. Factorising quadratics . More complex problems with fractions, including algebraic.	Term One Core Knowledge & Skills Test
	T2	Solving more complex equations involving fractions. Interpret, represent, and analyse data in grouped frequency tables. Drawing and interpreting cumulative frequency diagrams.	Term Two Core Knowledge & Skills Test
	T3	Recap standard form for large and small numbers. Understanding limits of accuracy. Interpret and draw time, exponential, linear, quadratic and cubic graphs. Calculating probability using set notation, Venn and tree diagrams.	Term Three Core Knowledge & Skills Test
	T4	Using knowledge acquired on circles to work with cylinders including composite shapes. Understanding the three trigonometric ratios to find sides and angles of right-angled triangles.	Term Four Core Knowledge & Skills Test
	T5	Interpret and draw graphs and recognise that the intersection solves simultaneous equations . Solving simultaneous equations algebraically.	Term Five Core Knowledge & Skills Test
	T6	Securing arithmetic, including fractions, decimals and BIDMAS. Using constructions to represent loci. Careers week lessons .	End of Year Examination

B. WIDER KEY STAGE THREE MATHEMATICS CURRICULUM

- Maths Watch and Dr Frost homework, as a revision tool.
- Practise towards and competing in National Individual Junior Mathematics Challenge
- Maths Masterclass Club preparing high performing mathematicians.
- House Maths Quiz - organised and led by Year 12 Maths Prefects (July).
- Daily Maths Club
- Organised Maths Mentor Pairs
- World Maths Day and Number Day
- Pi competition