Mathematics Curriculum Intent	
KS3	The KS3 curriculum is designed to build subject knowledge and understanding. We want students to develop problem solving skills as well as logic skills. To be able to apply mathematical concepts to real life scenarios. To think critically when presented with a problem. To have the ability to apply maths, for example developing financial sense (e.g. payslips and interest). Students will develop an understanding of how to check mathematical thinking in a logical, coherent way. The KS3 curriculum builds upon their prior knowledge from KS2, and links directly to the KS4 content. This gives all students a firm grounding to build upon at KS4. Students cover the five main domains of mathematics: number, ratio and proportion, algebra, geometry, and statistics and probability. They learn to solve problems in each of the domains. Students are regularly given the opportunity to reflect on their new learning and highlight outcomes as they go along. As students progress through the courses the level of Mathematical knowledge and understanding increases and students are required to link information in a logical manner, developing an appreciation for the interaction of different areas of Mathematics. .
KS4	Our KS4 scheme of learning covers Number, Shape and Space, Ratio and proportionality, Data Handling and Algebra in such a way that related mathematical concepts and skills can be taught coherently over a sequence of lessons. It therefore includes a wide range of exciting enrichment which provides enjoyment, breadth, and challenge. All strands of work are kept moving forward, topics are revisited over time ensuring that spaced memory retrieval allows concepts to be stored in long term memory. Scaffolding and modeling are used to support students at different levels. Students are regularly given the opportunity to reflect on their new learning and highlight outcomes as they go along. Assessments at regular intervals form part of the learning journey and students are all expected to be a key part of the process where they are given time to reflect on their progress and teachers' feedback after each assessment identifying where they did well and what they need to do to make improvements. Problem Solving is an integrated part of the curriculum and contextual problems provide a grounding in real life which reminds students that the subject has relevance in the world around us. It also provides pupils with the opportunity to learn of possible careers that require the ability to use the Mathematical skills they have studied on their learning journey. As students progress through the courses the level of Mathematical knowledge and understanding increases and students are required to link information in a logical manner, developing an appreciation for the interaction of different areas of Mathematics. . At the end of the KS4 course pupils will take the AQA GCSE exam at either Foundation or Higher tier and higher attaining Mathematicians will also be given the opportunity to take the AQA Level 2 Further Mathematics certificate.
KS5	Our KS5 options for Mathematics cover A level Mathematics, A Level Further Mathematics and Core Mathematics. Students will develop their conceptual understanding, and the ability to find and appreciate links between different elements of Mathematics (and other closely related disciplines) moving beyond a purely procedural understanding. Students will leave with the required skills and knowledge needed to pursue the study of Mathematics or another STEM discipline at a higher level, as well as a deeper appreciation of the beauty of Mathematics. It is the main intention that pupils, as a result of their KS5 experiences, become better at problem solving and users of Mathematics in all its varying forms.

Mathematics Curriculum Implementation						
	Autumn 1	**Autumn 2**	**Spring 1**	**Spring 2**	**Summer 1**	**Summer 2**
Year 7	Place Value Properties of Number: • Factors • Multiples • Squares • Cubes	Arithmetic with Integers and Decimals Expressions and Equations	Plotting Coordinates Perimeter & area	Comparing and Ordering fractions and decimals (positive and negative) Arithmetic procedures with Fractions	Understanding Multiplicative relationships: fractions and ratio	Probability: • Possible Outcomes
Year 8	Estimation and Rounding Sequences Transformations	Graphical Representation of Linear Equations	Understanding Multiplicative relationships: • Percentages • Proportionality	Solving Linear Equations Standard Form	Geometrical properties: polygons Constructions	Graphical representations of Data Numerical summaries of data
Year 9	Expressions and Formulae Non linear Relationships	Perimeter, area and volume	Geometrical properties: • Similarity • Pythagoras Theorem	Trigonometry	Probability: • Theoretical Probabilities	Graphical Representations
Year 10	**FOUNDATION TIER** • Basic number • Factors and multiples • Rounding • Basic algebra	**FOUNDATION TIER** • Basic fractions • Basic decimals • Basic percentages • Calculating with percentages • Sequences	**FOUNDATION TIER** • Angles • Properties of polygons • Statistical measures • Measures	**FOUNDATION TIER** • Coordinates and linear graphs • Real life graphs	**FOUNDATION TIER** • Ratio and proportion • Growth and decay • Pythagoras theorem	**FOUNDATION TIER** • Basic probability • Probability • 2D representation

	• Collecting and representing data • Scatter graphs **HIGHER TIER** • Basic number factors and multiples • Rounding • Basic algebra review • Equations • Indices • Standard form • Surds • Statistical measures • Constructions and loci **FURTHER MATHS** • Indices - More complicated indices and solving • Surds - More challenging rationalising	• Equations • Inequalities **HIGHER TIER** • Collecting and representing data • Scatter graphs • Fractions and decimals • Basic percentages • Calculating with percentages • Angles, scale diagrams and bearings • Properties of polygons **FURTHER MATHS**	• Perimeter and area • Circumference and area **HIGHER TIER** • Pythagoras theorem and basic trigonometry • Sine and cosine rules • Coordinates and linear graphs • Real life graphs • Measures • 2D representation of 3D shapes **FURTHER MATHS** • Plotting piecewise function • Pythagoras and trigonometry - Finding the angle between	• Transformations **HIGHER TIER** • Perimeter and area • Circumference and area • Volume • Ratio and proportion **FURTHER MATHS** • Ratio - Harder problems involving ratio	**HIGHER TIER** • Algebra: Quadratics Rearranging formulae Identities • Sequences **FURTHER MATHS** • Sequences - Harder sequence questions	s of 3D shapes • Scale diagrams and bearings • Trigonometry • Constructions and loci • Direct and inverse proportion **HIGHER TIER** • Further equations and graphs • Transformations • Basic probability • Probability • Simultaneous equations **FURTHER MATHS** • Completing the square - completing the square with x^2 coefficients greater than 1 • Simultaneous equations -

	the denominator		line and a plane or two planes • Linear graphs - Harder questions and using equation for line from A-level • Trigonometry - Using trigonometric identities			solve equations with 3 unknowns
Year 11	**FOUNDATION TIER** • Pythagoras Theorem • Trigonometry • Simultaneous equations • Proportion **HIGHER TIER**: • Pythagoras Theorem • Trigonometry • Simultaneous equations • Proportion **FURTHER MATHS** • Pythagoras and trigonometry - Finding the angle between line and a plane or two planes	**FOUNDATION TIER** • Angles and bearings • Angles in polygons **HIGHER TIER** • Angles and bearings • Angles in polygons • Circle Theorems **FURTHER MATHS** • Circle Theorems - Harder proof questions	**REVISION**	**REVISION**	**EXAMS**	**EXAMS**

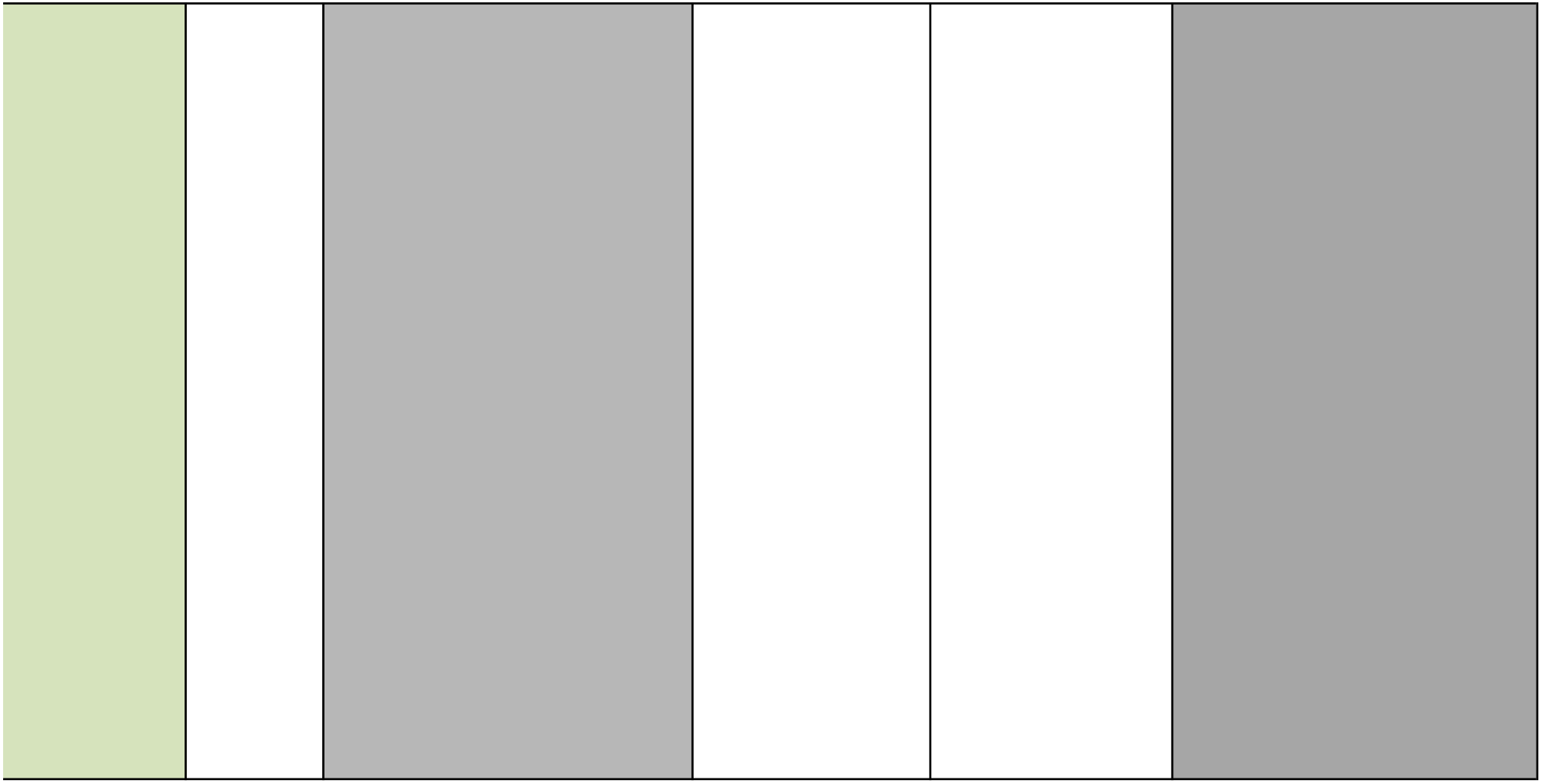
	• Trigonometry - Using trigonometric identities • Simultaneous equations - solve equations with 3 unknowns					
Year 12	***Maths "Year 1" pure content*** **Algebra** Proof Index law Quadratics Simultaneous equations Inequalities Binomial theorem Algebraic division **Graphs** Straight lines Circles Transformations **Trigonometry** Triangle problems Trig graphs CAST diagram Solving equations **Calculus** Differentiation integration **Vectors**	**Exponentials and Logs** Laws of logs Exponential functions Curve fitting ***Maths "Year 1" applied content*** **Statistics** Collecting and representing data Probability Discrete random variables Binomial distribution **Mechanics** Kinematics Forces and Newton's Laws ***Maths "Year 2" pure content*** **Agrabra** Further proof Functions Parametric equations	**Sequences & Series** Arithmetic Geometric **Binomial Theorem** **Trigonometry** Radian measure Inverse trig functions Reciprocal trig functions Compound angles $a\cos\theta + b\sin\theta$ **Numerical methods** Iteration Newton-Raphson method **Vectors** 3D Vectors **Calculus** Differentiation, including chain run, product rule Integration including substitution and by parts	**Calculus cont…** ***Maths "Year 2" applied content*** **Statistics** Conditional Probability Normal Distribution **Mechanics** Kinematics in 2D Projectiles Stiatics Dynamics Moments	***Further Maths "Year 1" core pure content*** **Complex numbers** Properties Arithmetic Solving equations Argand diagrams Modulus argument form Loci **Matrices** Properties Arithmetic Transformations	**Algebra and series** Roots of polynomials Summing powers Proof by induction **Vectors** Straight lines Scalar product Planes

	2D vectors	Partial fractions				
Year 12 Core Maths	**Recap Percentages** **Maths for Personal Finance** **Analysis of data** **Estimation**	**Critical analysis if data given models** **The Normal Distribution** **Maths for Personal Finance**	**Maths for Personal Finance** **Probabilities and estimation**	**Correlation and regression** **Maths for Personal Finance**	**Revision**	**Exam period**
Year 13	**Calculus** Volumes of revolution ***Further Maths "Year 2" core pure content*** **Complex numbers** De Moivre Roots of unity ***Further Maths chosen units*** **Further Mechanics 1** Work energy power Hooks Law Momentum Collisions Impulses	**Series** **Polar Coordinates** **Hyperbolics** **Further Mechanics 1 cont ...**	**Calculus** Improper integrals Inverse trig functions Hyperbolic functions Partial fractions Polar graphs and areas **Further Statistics 1** **Poisson distribution** Negative binomial distribution Geometric distribution CLT PGF Chi-squared	**Calculus cont…** **Differential equations** First order Second order Simple harmonic motion Modelling Coupled **Further Statistics 1 cont...**	**Revision**	**Exam period**

Maths Curriculum Impact KS3

		FORMATIVE; *The instructional guidance that identifies central points of learning and plans for the progression of individual students.*	SUMMATIVE; *This describes individuals learning at the end of an instructional unit by comparing it against a standard or benchmark. (High Stakes Assessment)*	EVALUATIVE; *This is about institutional accountability and comes after terminal exams. External agencies.*
TIMESCALE	**Annually**		**Year 7:** - End of Year assessment - based upon all topics taught in year 7. **Year 8:** - End of Year assessment - based upon all topics taught in year 8.	The Maths Department tracks and evaluates summative assessment performance across the year to form a holistic view of student performance and progress and uses this to inform teaching, feedback, targets and intervention strategies. Departmental data spreadsheets are kept centrally on the subject drive. These are updated with all student data in KS3, and regularly monitored by the subject leader.

	Interim (termly or half-termly)		Teachers: - Evaluate student learning at the end of a certain teaching period. - Evaluate their teaching practice and lessons in line with Summative Assessment outcomes. 4 formal assessment points across each year at the end of each unit. Levels based upon the following levels: - Mastery - Secure - Emerging - Developing Written feedback and student responses in the form of react should be evident. These are in student assessment books or folders/exercise books.	



	Weekly	Teachers role: - Identify how students are performing and use this to provide support, evaluate student learning and plan future lessons. - Provide oral and/or written feedback. - Keep track of student progress using department internal and school wide data systems. - Scaffold feedback to students for effective self/peer assessment. Students role: - Engage in self assessment. - Engage in peer assessment. - Be proactive in ReACT tasks. - Revise content.	

		- Identify their own strengths and weaknesses and ask for support from their subject teachers. .	

	Hourly	*'Every Lesson Every Day'* techniques are embedded in lessons including: - Review last lesson, last week, last year. - Checking for student understanding, asking higher order questions and providing feedback - ensuring students respond to this feedback. - Low stakes testing activities. Every lesson a variety of the following formative assessment takes place using the following strategies: - Questioning - Low stakes testing - Spiral learning - Oral feedback - Whole-class feedback - Class and teaching modelling - Regular re-cap quizzes	

		- Retrieval practice tasks	

		Mathematics Curriculum Impact KS5		
		FORMATIVE; *The instructional guidance that identifies central points of learning and plans for the progression of individual students.*	**SUMMATIVE;** *This describes individuals learning at the end of an instructional unit by comparing it against a standard or benchmark. (High Stakes Assessment)*	**EVALUATIVE;** *This is about institutional accountability and comes after terminal exams. External agencies.*
TIMESCALE	**Annually**		**Year 12:** (Maths/FMaths) - End of Year assessment (June) - based upon all topics taught in year 12. - 2 Papers are sat for the Pure and applied sections of the course/ A2 Pure paper 2+ Further Core Maths - 2 Hours for Pure paper and 1 hour 15 mins for applied paper minutes for each paper - Pure A2 paper is 2 hours and the FMaths Core is 1 hour 45 mins **Year 13:** - Mock Examinations (September, December and February) - based upon all topics taught to this point. - 2 Papers are set for the two halves of the course. - 105 minutes for each paper	Nationally standardised summative assessment takes the form of A-levels and vocational qualifications at the end of Key Stage 5. **A-level exam board**: Edexcel Pearson **Exam structure:** Paper 1 : 2hr (33%) Paper 2 : 2hr (33%) Paper 3 : 2hr (33%) *Paper 1 1 hr 30 mins(* *Paper 2 1 hr 30 mins* *Paper 3 1 hr 30 mins* *Paper 4 1 hr 30 mins* Core Maths Exam Board AQA *Paper 1 1 hr 30 mins(*

			- Paper 3 mock to be sat after Easter - 150 minutes.	*Paper 2 1 hr 30 mins*
	Interim (termly or half-termly)		**<u>Cumulative Testing:</u>** ● Each half term- yr 12 OR termly - yr13 students will sit cumulative tests covering all topics covered to date. ● The exam will use questions taken from the exam board which have previously been in real exams. ● The assessments will be approximately 50 minutes. ● Exams are marked and moderated in-house. ● ● Grade boundaries from the most recent exam series are used where possible and fine grades used to identify those needing intervention/ additional support **<u>End of topic exams</u>** End of topic test continuing practice questions for the cumulative tests are provided to students to complete as lesson time. Students complete this test under exam conditions and then will be provided with feedback based on how to improve their performance. **<u>Folder checks</u>** Folders are collected half termly to ensure students are managing their notes and time well. Feedback is provided by monitoring sheets	
	Weekly	**Teachers role:** - Identify how students are performing and use this to provide support, evaluate student learning and plan future lessons. - Provide oral and/or written feedback.		

		- Keep track of student progress using department internal and school wide data systems. - Scaffold feedback to students for effective self/peer assessment. - Exam questions set weekly according to retrieval rota of work - students submit for marking and feedback given and marking used to develop starter activities for subsequent lessons **Students role:** - Engage in self assessment of additional homework/classwork - . - Be proactive in ReACT taks. - Revise content. - Redraft and submit work which is completed to the best of their abilities. - Identify their own strengths and weaknesses and ask for support from their subject teachers. .	
	Hourly	*Every Lesson Every Day'* techniques are embedded in lessons formative assessment takes place using the following strategies: - Questioning - Low stakes testing - Oral feedback - Whole-class feedback - Retrieval starter tasks	