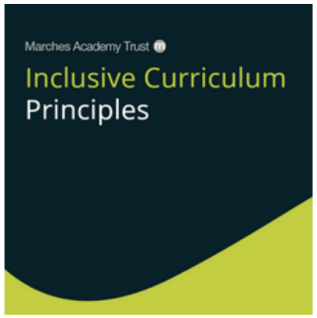
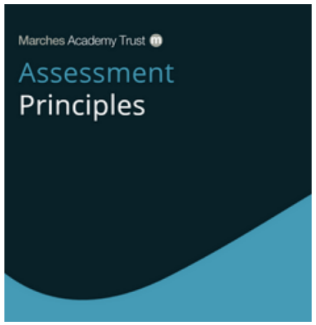
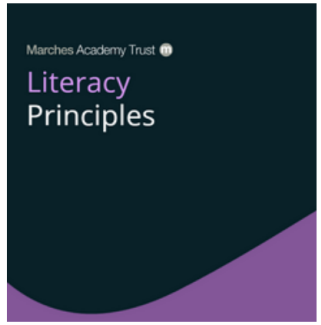
2026-2028 CURRICULUM







What is our curriculum development work focused on?

Building and strengthening the foundation offer through:

1. **K**S2-KS5 sequencing (disciplinary and substantive knowledge).
2. **V**ocabulary- tier 2 and 3
3. **D**isciplinary Literacy

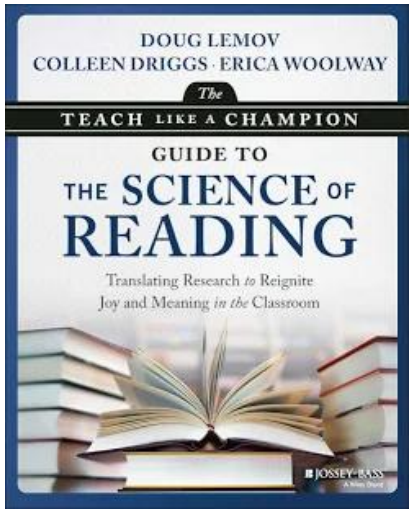
Oracy: threaded through all 3 areas. Can students speak it?

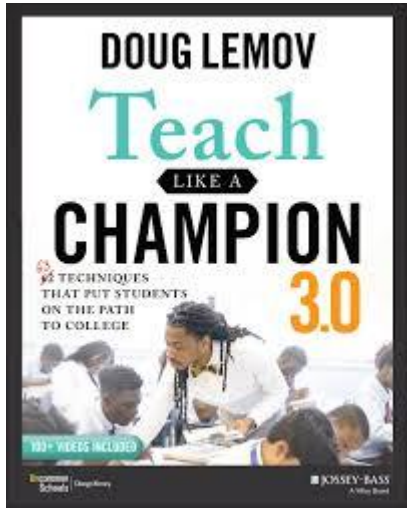
Implemented through:

- ELET (TLAC + Science of Reading strategies)

SJT Every Lesson Every Time

1 step at a time Curriculum planning is crafted to ensure low cognitive load for all	• **Accessible resources** : clear, inclusive and adapted materials. • **Regulation breaks** built into lesson plans as appropriate. • Clear and **concise language** for instruction. • **Chunk instructions** : clear, manageable steps.
2 consistent routines (entrance and exit) A calm and consistent classroom environment for all	• **Entrance routine:** students invited in, meet and greet, equipment out. • **Do now:** based on retrieval and visible on entry. • **High expectations:** established and repeated throughout. • **Exit routine:** 2 minutes before the bell- students stand behind chairs before dismissal. Circulate the room to assess standards of work.
3 checks for understanding All are made to think hard, and AFL is used to inform future adaption	• **Lesson planning** crafts opportunities for AFL to assess learning. *E.g. 3,2,1 show me boards, cold call, active observation, exit tickets.* • **Circulate:** monitor behaviour, presentation, literacy and address misconceptions. • **Adapt**: through re-teaching, giving feedback, scaffolding or challenge. • **Respond**: students reflect/act on the feedback live in lessons.
Look **4** the scaffold Modelling and support for all to be successful	• Informed by assessment of current knowledge and skill. • **Scaffold:** gradually taken away. I do, we do, you do. • **Model and WAGOLL:** show what success looks like from the start.
5 foundational skills All lessons are planned to adapt to literacy and numeracy data utilising foundational skills were appropriate.	• **Academic language:** Key 3 explicit vocabulary identified, displayed and checked for understanding. • **Communication**: speaking and listening opportunities scaffold talk and promote oracy. • **Reading:** AIR and FASE techniques are used to aid reading fluency and comprehension. • **Writing:** focus on SPaG, handwriting and disciplinary writing skills. • **Numeracy:** planning for numeracy application across the curriculum.





What academic research underpins our curriculum work?

Education Endowment Foundation

IMPROVING LITERACY IN SECONDARY SCHOOLS

Summary of recommendations

1 Prioritise 'disciplinary literacy' across the curriculum

- Literacy is key to learning across all subjects in secondary school and a strong predictor of outcomes in later life.
- Disciplinary literacy is an approach to improving literacy across the curriculum that emphasises the importance of subject specific support.
- All teachers should be supported to understand how to teach students to read, write and communicate effectively in their subjects.
- School leaders can help teachers by ensuring training related to literacy prioritises subject specificity over general approaches.

2 Provide targeted vocabulary instruction in every subject

- Teachers in every subject should provide explicit vocabulary instruction to help students access and use academic language.
- Effective approaches, including those related to etymology and morphology, will help students remember new words and make connections between words.
- Teachers should prioritise teaching Tier 2 and 3 vocabulary, which students are unlikely to encounter in everyday speech.
- Teachers and subject leaders should consider which words and phrases to teach as part of curriculum planning.

3 Develop students' ability to read complex academic texts

- Training focused on teaching reading is likely to help secondary school teachers teach their subject more effectively.
- To comprehend complex texts, students need to actively engage with what they are reading and use their existing subject knowledge.
- Reading strategies, such as activating prior knowledge, prediction and questioning can improve students' comprehension.
- Strategies can be introduced through modelling and group work, before support is gradually removed to promote independence.

4 Break down complex writing tasks

- Writing is challenging and students in every subject will benefit from explicit instruction in how to improve.
- Teachers can break writing down into planning, monitoring and evaluation, and can support students by modelling each step.
- Targeted support should be provided to students who struggle to write fluently, as this may affect writing quality.
- Teachers can use a variety of approaches, including collaborative and paired writing, to motivate students to write.

5 Combine writing instruction with reading in every subject

- Combining reading activities and writing instruction is likely to improve students' skills in both, compared to a less balanced approach.
- Reading helps students gain knowledge, which leads to better writing, whilst writing can deepen students' understanding of ideas.
- Students should be taught to recognise features, aims and conventions of good writing within each subject.
- Teaching spelling, grammar and punctuation explicitly can improve students' writing, particularly when focused on meaning.

6 Provide opportunities for structured talk

- Talk matters: both in its own right and because of its impact on other aspects of learning.
- High quality talk is typically well-structured and guided by teachers.
- Accountable talk is a useful framework to ensure talk is high quality, and emphasises how talk can be subject specific.
- Teachers can support students by modelling high quality talk, for example including key vocabulary and metacognitive reflection.

7 Provide high quality literacy interventions for struggling students

- Schools should expect and proactively plan to support students with the weakest levels of literacy, particularly in Year 7.
- Developing a model of tiered support, which increases in intensity in line with need is a promising approach.
- Assessment should be used to match students to appropriate types of intervention, and to monitor the impact of interventions.
- Creating a co-ordinated system of support is a significant challenge requiring both specialist input and whole school leadership.

Maths

Our vision

The overarching aim of the teaching of Mathematics at Sir John Talbot School is to develop the students' mathematical fluency and enable them to apply to #realworldready examples. Students will leave with the mathematical knowledge to understand the world, to apply mathematical skills to different scenarios and have honed their ability to solve problems through methodical processes.

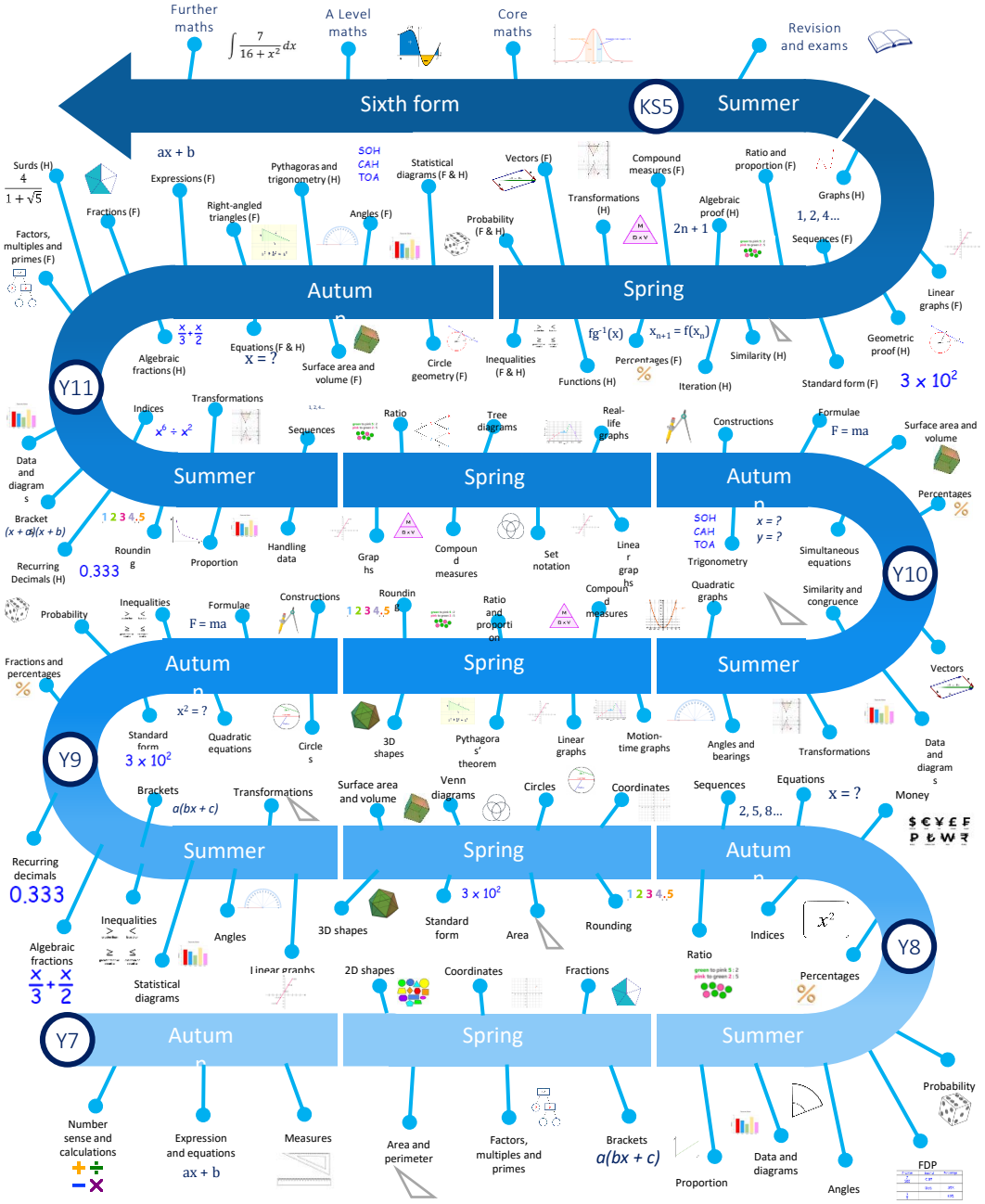
The Mathematics department will promote the development of confidence, willingness to learn and interest in the various aspects of mathematics. The department aspires to remove the "mystery of maths" and providing students of all abilities the opportunities to become numerate and confident with maths beyond the classroom.

MATHS LEARNING PATHWAY YEARS 7 - 13

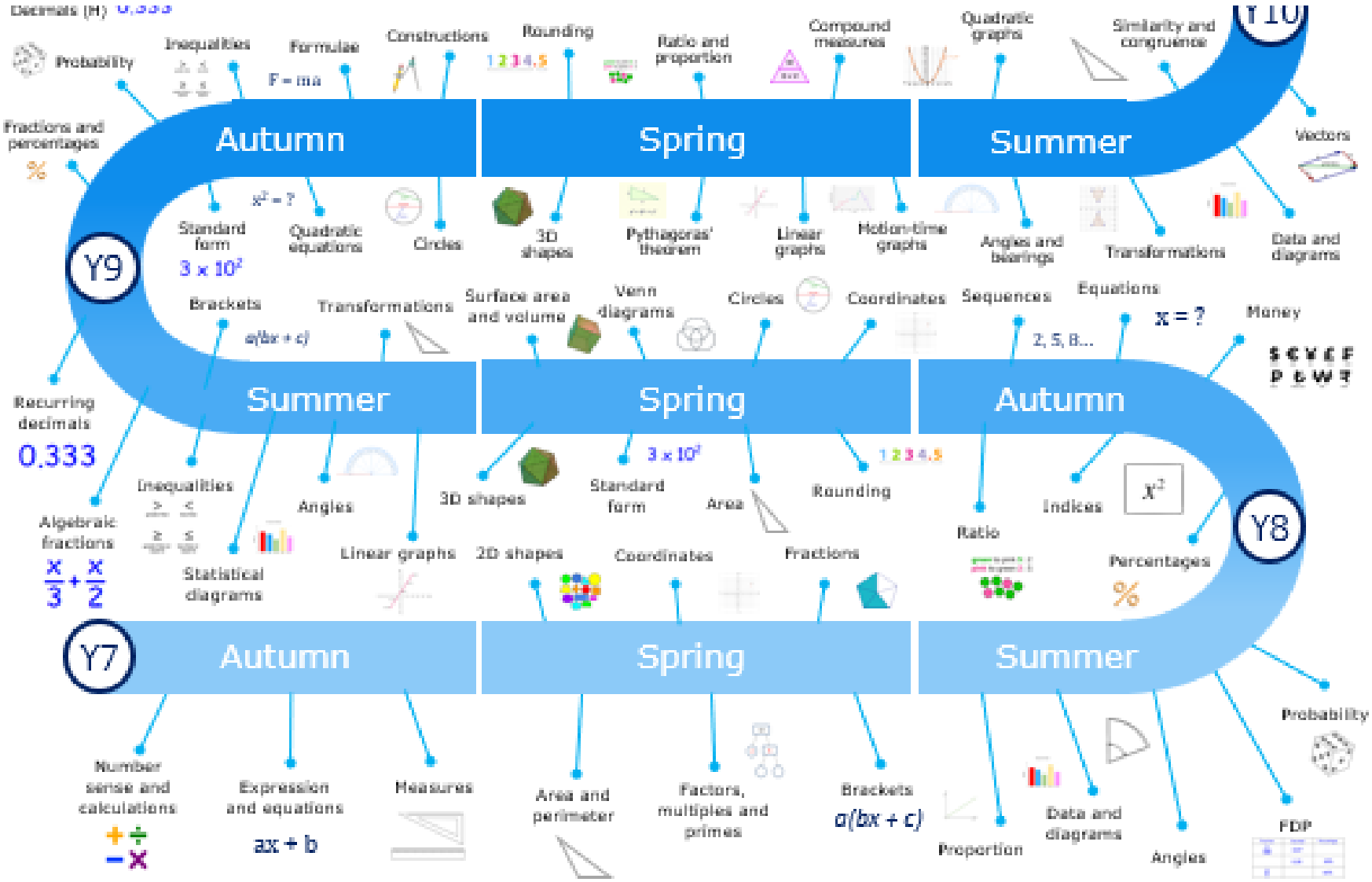
The big picture

Developing mathematical fluency and reasoning skills through an enjoyable curriculum, leading to all students achieving their potential.

Sir John Talbot's school

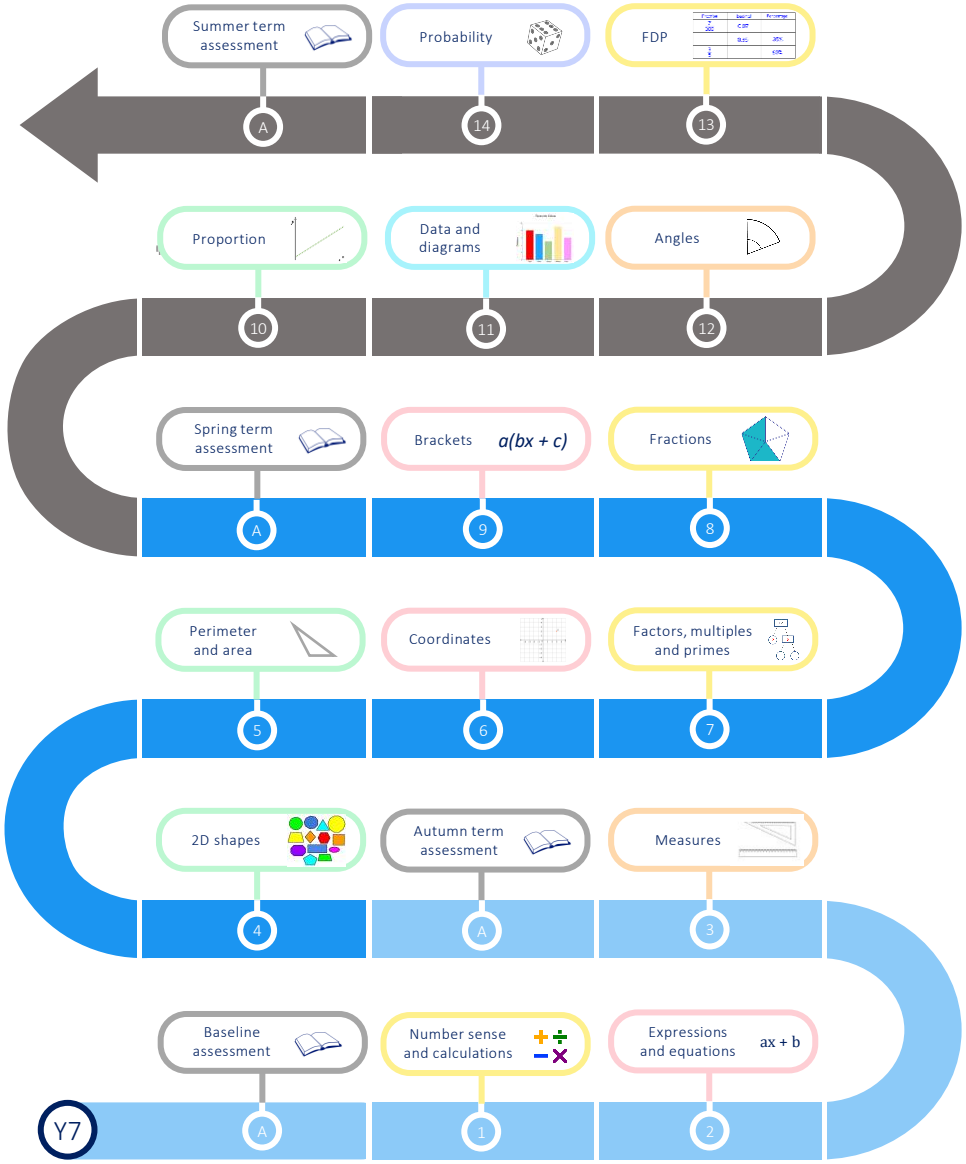


Key Stage 3


Y7
Autumn
Number sense and calculations
Expression and equations
ax + b
Measures
Spring
Area and perimeter
Factors, multiples and primes
Brackets
a(bx + c)
Summer
Proportion
Data and diagrams
Angles
FDP
Probability
Y8
Autumn
Ratio
Indices
Percentages
Spring
Fractions
Coordinates
2D shapes
Rounding
Area
Standard form
3D shapes
Summer
Linear graphs
Angles
Statistical diagrams
Inequalities
Algebraic fractions
Recurring decimals
0.333
Y9
Summer
Brackets
Transformations
Surface area and volume
Venn diagrams
Circles
Coordinates
Sequences
Equations
Money
Spring
Standard form
Quadratic equations
Circles
3D shapes
Pythagoras' theorem
Linear graphs
Motion-time graphs
Angles and bearings
Transformations
Data and diagrams
Autumn
Probability
Fractions and percentages
Inequalities
Formulae
Constructions
Rounding
Ratio and proportion
Compound measures
Quadratic graphs
Similarity and congruence
Vectors
Y10

MATHS LEARNING PATHWAY
YEAR 7

Sir John Talbot's school



Strand key:

Number | Algebra | Geometry | Probability | Statistics | Ratio & Proportion

		Content	Fluency	Problem solving	Prior Knowledge (KS2)	Future learning (KS3)
Year 7 Curriculum Overview - Maths	Autumn Term	Number Sense and calculations • Number sense • Adding and subtracting • Multiplying • Dividing • Calculating with negative numbers • Order of operations	Understanding of place values for integers and decimals.	What is the number that can be described at 13 tens? How many different ways can you describe the number 145?	Place value, with reference to the place value table for integers and decimals. Written methods are formally taught at primary school. Recall of times tables to support multiplication and division	Learning is crucial for all further topics
			Correctly apply formal written methods for integers and decimals for the four operations	Completing two way tables and frequency tree diagrams. Money problems, including bank statements		
			Use a number line to calculate the four operations with negative numbers			
			Understand the importance of the order of operations			
		Expressions and equations • Expressions • Substitution • Solving equations	Correctly use algebraic notation and vocabulary Simplify expressions by collecting like terms	Given the answer is $4x + 5$, what might the question have been?	Link to integers, decimals and negative numbers from *number sense and calculations* unit. Function machines	Fundamental skills required for all further algebra topics.
			Substitute any value into expressions	Real life formulae including areas of known shape		
			Solve equations with one and two steps			
		Measures • Time • Measures	Converting units of time. Calculating with time.	Using timetables and calendars.	Clocks and telling the time taught at KS1/2 however this is a known gap in knowledge	Compound measures Area, perimeter, volume, surface area
			Estimating and measuring lengths, mass and capacity. Converting units of length, mass and capacity	How many 30cm rulers is the length of the classroom? How many average weight humans is the weight of an elephant?		

		Content	Fluency	Problem solving	Prior Knowledge (KS2)	Future learning (KS3)
Year 7 Curriculum Overview - Maths	Spring Term	2D shapes • Line and shape properties	Properties of lines and shapes. Line and rotational symmetry	Describe a shape using the properties – what is the shape?	Covered in KS1/KS2	Transformations, angle reasoning
		Perimeter and Area • Perimeter • Area	Finding perimeters using grids for counting. Calculate perimeter of simple and compound shapes	Given the perimeter of 20cm, what could the dimension of the shape be?	Covered in KS1/2	Area and perimeter of circles, trapeziums and other compound shapes. Volume of prisms (requiring the cross sectional area)
			Finding areas using grids. Calculate areas of rectangles, triangles and compound shapes.	How many chickens fit in a field? How many tins of paint to paint a wall?		
		Coordinates • Coordinates and shapes	Reading and plotting coordinates	Coordinates of missing vertices of shapes (using properties of shapes)	Properties of shapes	Plotting linear and non linear graphs Midpoints of lines
		Factors, multiples and primes • Factors and multiples • Primes	Finding factors and multiples using divisibility tests and times tables. Identifying HCF/LCM of pairs of numbers	Two buses leave at the same time, when is the next time they leave at the same time? Sharing lengths in common factors	Strong recall of times tables. Using written methods of dividing integers	Expanding and factorising expressions HCF/LCM with venn diagrams
			Identifying prime numbers and using them to decompose numbers	How do you know if a number is a square number using the factors?		
		Fractions • Writing and comparing fractions • Adding and subtracting fractions	Identify fractions from shapes. Use equivalent fractions to simplify, convert between mixed and improper fractions and order fractions		Using LCM/HCF from *factors, multiples, primes* unit. Times table recall for equivalent and simplifying. Represent diagrammatically seen at primary.	Multiplication and division of fractions Simplifying algebraic fractions
			Add and subtract proper fractions and mixed numbers	Perimeter of shapes with fractions (both proper and mixed numbers)		
		Brackets • Single brackets	Expand single brackets and simplify where necessary. Factorise expressions	Giving expressions for area, and given area finding lengths	HCF from *factors, multiples, primes* unit. Simplifying expressions from *expressions and equations* unit	Expand and factorise double brackets Applications to geometry problems

		Content	Fluency	Problem solving	Prior Knowledge (KS2)	Future learning (KS3)
Year 7 Curriculum Overview - Maths	Summer Term	Angles • Angles • Finding unknown angles	Naming types of angles, estimating/measuring/ drawing angles	Bunny and Angles - Game involving Constructing Angles (math10.com)		Angles in parallel lines and polygons
			Angles on a line, around a point, in a triangle and vertically opposite.			
		Handling Data and statistical diagrams • Averages and range • Tables and chart • Collecting and representing data	Calculate the range, mean, mode, median and range	Show me questions: give me 5 vales that have a mode of 4 etc.	Recall of place value and calculations from *number sense and calculations* unit	Averages from grouped data Difference between bar graphs and histograms
			Draw and interpret frequency tables, two way tables, tally charts, pictograms and bar charts			
			Present data and make conclusions using averages and tables			
		Proportion • Proportion word problems	Using unitary method, recipes and conversion graphs to solve direct proportion questions	Is a homemade meal better value for money than shop bought?		Calculator skills practice that will be embedded over the years
		Fractions, decimals and percentages • Multiplying and dividing fractions • Fraction of an amount • Fractions, decimals and percentages	Multiply and divide proper fractions and mixed numbers	Area of shapes with fractional lengths	Recall of equivalent fractions for *fractions* unit	Multiplication and division of algebraic fractions. Proportional questions
			Calculating fractions of an amount with and without a calculator.	If 3/5 of a number is 27, what is 2/9^{ths} of the same number?		
			Convert between fractions, decimals and percentages			
		Probability • Theoretical probability	Use probability phrases to real life examples. Identify probabilities of mutually exclusive events and give as fractions, decimals and percentages.	Will repeating experiments get the same results?	Adding and subtracting fractions from *fractions* unit. Converting between FDP from *fractions, decimals and percentages* unit.	Probability of multiple events, link to probability trees

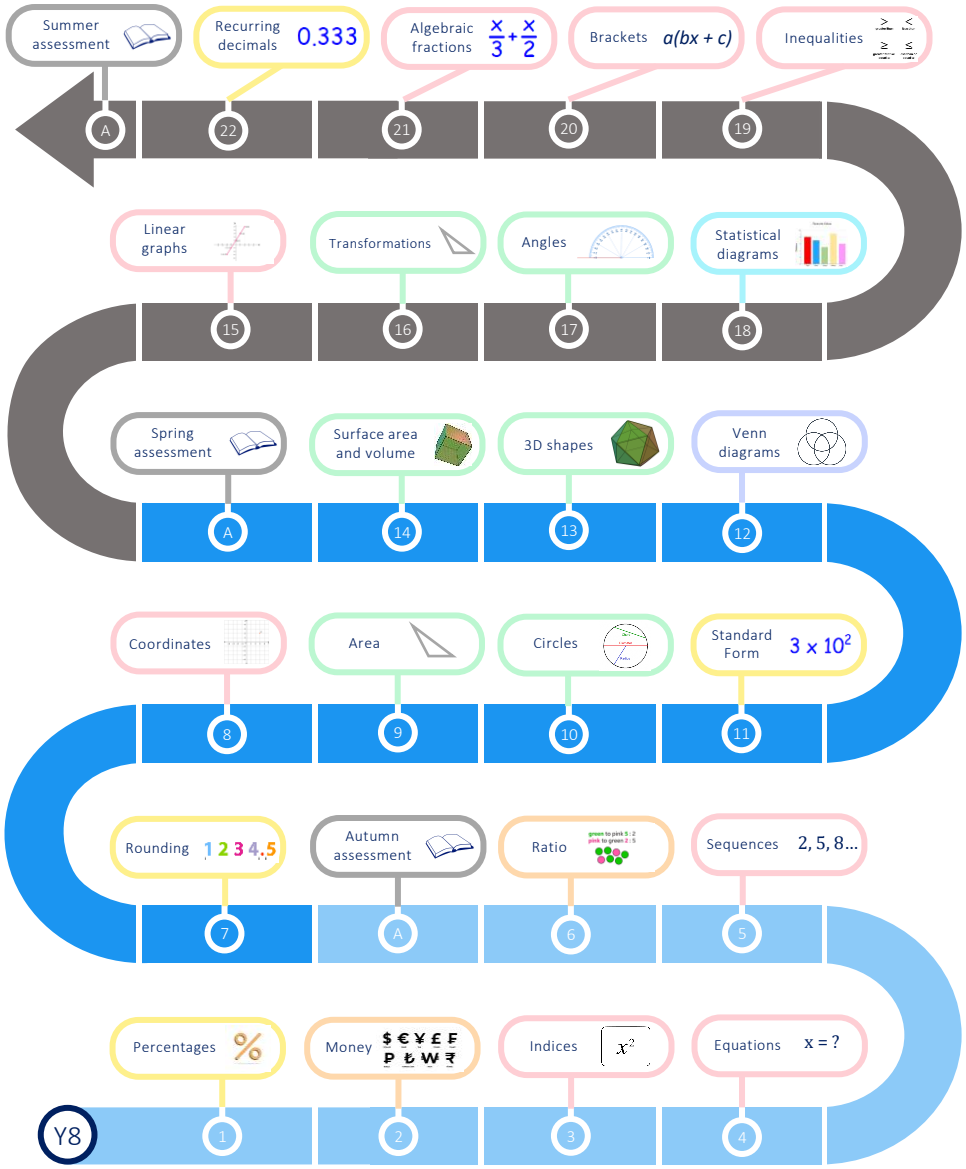
Speak like a Mathematician (Year 7)

Vocabulary	Logo	Definition
Integer		A whole number that is positive, negative, or zero.
Indices		Numbers that show how many times a base is multiplied by itself.
Variable		A letter or symbol representing an unknown or changing value.
Expression		A mathematical phrase containing numbers, variables and operations, but no equals sign.
Substitute		To replace a variable with a given value.
Equation		A mathematical statement showing that two expressions are equal.
Perimeter		The total distance around the outside of a shape.
Area		The amount of space inside a 2D shape.
Coordinate		A pair of numbers used to locate a point on a grid.

Factors		Numbers that divide exactly into another number.
Multiple		A number found by multiplying another number by an integer.
Prime		A number greater than 1 that has exactly two factors: 1 and itself.
Numerator		The top number of a fraction, showing how many parts are being considered.
Denominator		The bottom number of a fraction, showing the total number of equal parts.
Proportion		A statement showing two ratios or fractions are equal.
Frequency		The number of times a value occurs.

MATHS LEARNING PATHWAY
YEAR 8

Sir John Talbot's school



Strand key:

Number | Algebra | Geometry | Probability | Statistics | Ratio & Proportion

		Content	Fluency	Problem solving	Prior Knowledge (KS2)	Future learning (KS3)
Year 8 Curriculum Overview - Maths	Autumn Term	Percentages • Percentage of amounts • Percentage change	Finding percentage of amounts with and without a calculator Finding percentage change with and without a calculator	Does a 10% increase followed by a 10% decrease return to the original value?	Converting between fractions, decimals and percentages Fractions of an amount with and without a calculator	Calculating simple and compound interest. Finding original amounts given percentage change.
		Money • Calculating with money	Unit cost of products (using the unitary method)	Best buy problems. Comparing with different capacity and mass given.	Solving proportional problems Four operations with decimals	Link to compound and simple interest. Best buys/ value for money
		Indices • Index Laws	Simplifying expressions using index laws with positive and negative indices Simplify algebraic fractions by cancelling common factors	Evaluated indices, what was the possible question?	Calculating with roots and powers Simplifying fractions Algebraic notation	Simplify index laws with negative and fractions. Evaluate and simplify
		Equations • Solving equations	Solve equations with fractions with the variable in the numerator and denominator Solve equations with brackets and unknowns on both sides Construct and solve equations	Construct and solve equations with perimeter and angles. Think of a number questions – write algebraically	Solve one and two step equations Simplify expressions Substitute into expressions	Solve simultaneous equations Solve equations with more than one variable.
		Sequences • Term to term rules • Position to term rules	Continue and describe term to term sequences with numbers and patterns Substitute into position to term rules to generate arithmetic sequences	Given the 2nd and 4th term, identify the other terms and describe the sequence. Is a number in a sequence – solve to prove	Using number lines Four operations with negative numbers Substitute into expressions with multiple operations	Nth term of arithmetic sequences. Position to term of arithmetic, geometric, quadratic sequences.
		Ratio • Ratio • Scale Drawing	Writing, simplifying and sharing by ratios Draw and interpret scale drawings	Interpreting scales from OS maps. Why do we use scales in architecture?	Finding HCF Constructing fractions Writing numbers as a percentage of another	Accurate drawing with bearings. Calculate real area/ perimeter.

		Content	Fluency	Problem solving	Prior Knowledge (KS2)	Future learning (KS3)
Year 8 Curriculum Overview - Maths	Spring Term	Rounding • Significant figures	Rounding integers and decimals to given significant figures Estimating calculations	Why do we estimate? What is the impact of over/ under estimating?	Rounding to 10, 100, 1000	Estimation Error intervals
		Coordinates • Coordinates and midpoints	Calculating midpoints	Shape problems with coordinates	Reading and plotting coordinates	Equation of a line from a graph and coordinates
		Area • Area and units	Area of parallelograms and trapezium Converting units of area	Given different units, find areas. How many mm^2, make $1m^2$?	Areas of rectangles, triangles, compound shapes Converting lengths	Similarity for area and volume Volume of prisms
		Circles • Area and circumference	Identify parts of a circle Finding circumference of circles Finding areas of circles	Rearrange formulas to find radius/ diameter? How much fencing around a pond?	Calculating with powers and roots Substituting into algebraic formulae Rounding decimals	Volume and surface area of cylinders Volume and surface area of cones
		Standard form • Standard form and ordinary numbers	Using standard form with positive and negative indices	Compare the differences between numbers with different powers	Multiplying and dividing by 10, 100, 1000	Four operations with standard form
		Venn diagrams • Venn diagrams • Factors, multiples and primes	Completing venn diagrams and identifying probabilities from them Finding HCF/ LCM using prime factor decomposition	Worded problems, to identify if they are examples of HCF/LCM Use the HCF/LCM to create venn diagram to then find original numbers	Writing probabilities as fractions, decimals, percentages Probabilities of mutually exclusive events LCM/ HCF Prime number decomposition	Venn diagrams with set notation
		3D shapes • Nets	Properties of 3D shapes Nets of 3D shapes	How many different nets of cubes are there? Why are there many alternatives?	Shape properties	Surface area and volume of prisms
		Surface area and volume • Surface area • Volume	Finding surface area of cubes, cuboids and prisms Finding volume of cubes, cuboids and prisms	How many litres of paint for a cube? Two shapes with equal volumes, what are the dimensions?	Nets of shapes Area of compound shape Converting units of lengths	Volume and surface area of cylinders, pyramids, spheres

		Content	Fluency	Problem solving	Prior Knowledge (KS2)	Future learning (KS3)
Year 8 Curriculum Overview - Maths	Summer Term	Linear Graphs • Plotting graphs and finding equations	Plotting horizontal, vertical and straight lines Finding equations of straight line graphs	Total cost vs. time, find the equation of the line to then find any value.	Reading and plotting coordinates Substituting into algebraic formulae	Speed from a distance/time graph
		Transformations • Transforming shapes	Translation Reflection	Identify the translation and reflection that has happened	Reading and plotting coordinates	Vectors
		Angles • Finding unknown angles	Angles in quadrilaterals Angles in parallel lines Angles in polygons	Given the type of quadrilateral, what do we know about the angles? Using combination of angle rules to answer multi-step questions	Angles on a line, about a point, in a triangle Vertically opposite angles	Bearings
		Statistical diagrams • Drawing and interpreting statistical diagrams	Draw and interpret pie charts, line graphs, stem and leaf diagrams Finding averages from diagrams	How can graphs be misleading? Which average should be used depending on the information being portrayed?	Draw angles Angles on a line and a point Fraction of an amount without a calculator Averages and range	Plot and interpret scatter graphs
		Inequalities • Linear inequalities	Reading and drawing linear inequalities on number lines Solve linear inequalities	What is the maximum and minimum integer values that can be the solution?	Using number lines Solving equations with one or more steps	Double inequalities
		Brackets • Double brackets	Expand double brackets	Giving expressions for areas of shapes in algebraic terms	Expand and simplify single brackets	Factorise quadratic expressions
		Algebraic Fractions • Fractions review • Algebraic fractions	Four operations with fractions Simplify algebraic fractions by factorising Adding and subtracting algebraic fractions	Express an algebraic fraction with index laws.	Four operations with proper fractions and mixed numbers Factorising into a single brackets	Algebraic fractions with unknowns in the denominator
		Recurring decimals • Fractions and recurring decimals	Converting between fractions to recurring decimals *(do not cover decimal to fraction)*	What is the difference between 0.3 and $0.\dot{3}$? What impact does this have?	Written methods to divide with decimals Convert fractions, decimals, percentages	Converting recurring decimals to fractions

Speak like a Mathematician (Year 8)

Vocabulary	Logo	Definition
Best Buy		The option that gives the greatest value for money.
Arithmetic Sequence		A sequence where the difference between consecutive terms is constant.
Ratio		A comparison between two or more quantities.
Significant Figures		The digits in a number that determine its precision.
Midpoint		The point exactly halfway between two points.
Circumference		The distance around a circle.
Venn Diagram		A diagram showing relationships between sets using overlapping circles.
Net		A two-dimensional pattern that folds to make a three-dimensional shape.
Surface Area		The total area of all the external faces of a 3D shape.
Volume		The amount of space inside a 3D shape.

y-intercept		The point where a graph crosses the y-axis.
Congruent		Shapes that are exactly the same size and shape.
Parallel		Lines that remain the same distance apart and never meet.
Inequality		A statement comparing values using <, >, ≤ or ≥.
Recurring Decimal		A decimal that repeats forever.
Terminating Decimal		A decimal that ends.

MATHS LEARNING PATHWAY
YEAR 9

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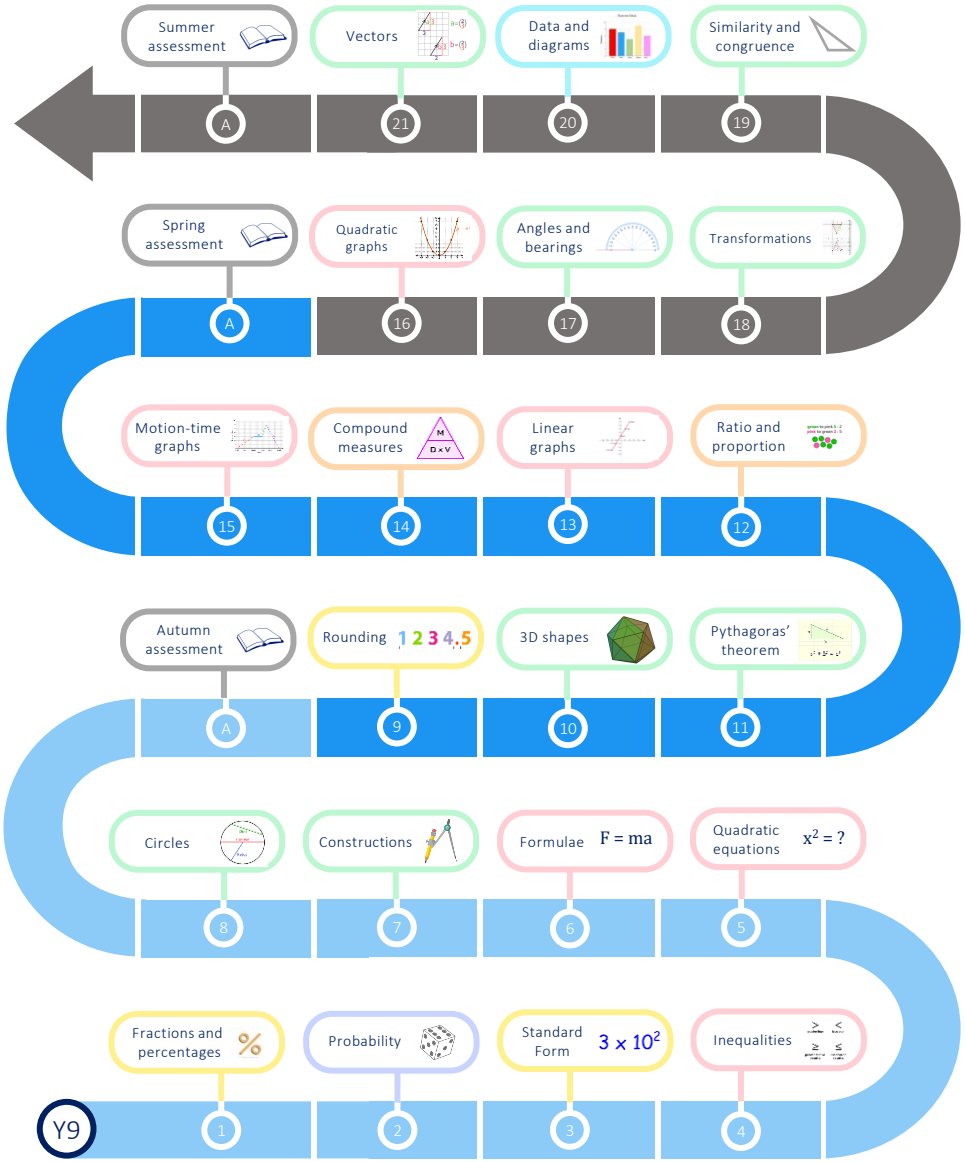


Strand key:

Number | Algebra | Geometry | Probability | Statistics | Ratio & Proportion

		Content	Fluency	Problem solving	Prior Knowledge	Future learning (KS4)
Year 9 Curriculum Overview - Maths	Autumn Term	Fractions and percentages • Fractions, decimals and percentages review • Percentage change	Confidently convert between FDP Find percentage of amounts with and without a calculator Simple interest calculations Percentage change with and without calculator Find original amounts following percentage change	How many years has compound interest been applied? What percentage of compound and simple interest? Compare two investment options, which is best?	Finding equivalent fractions Ordering fractions Multiplying fractions	Convert between recurring decimals and fractions
		Probability • Theoretical and experimental probability	Comparing theoretical and experimental probability Frequency trees	Horse race investigation – what is the benefit of more trials to compare?	Writing probabilities as FDP Finding percentage and fraction of an amount	Probabilities from venn diagram and two way tables. Tree diagrams
		Standard form • Calculations with standard form	Four operations with standard form Inputting standard form on a calculator	How many times closer to the sun is the Earth compared to Neptune?	Laws of indices Use of a calculator	Complex calculator input
		Inequalities • Linear inequalities	Solve inequalities with unknowns on both sides Double inequalities Construct and solve inequalities		Inequalities on number lines Solve single inequalities	Graphs of inequalities
		Quadratic equations • Factorise and solve quadratic equations	Factorise and solve quadratics	Find the lengths of shapes given area?	Expand double brackets Factorise single brackets	Complete the square Factorise quadratics
		Formulae • Rearranging formulae	Changing the subject by rearranging	Rearrange SUVAT equations and other scientific equations	Solving equations	Applying to higher tier formula
		Constructions • Constructing bisectors and perpendicular lines	Construct bisectors or lines and angles	Which constructions are needed to construct 30^0 and 135^0 without a protractor?	Using rulers and compasses	Construct loci and triangles
		Circles and cylinders • Circles and cylinders	Finding areas and arc lengths of sectors Surface area and volume of cylinders	What is the angle of the sector? What is the area of a label of a pringles tube?	Area and circumference of circles Surface area and volume of prisms	Finding surface area and volume of cones and spheres,

		Content	Fluency	Problem solving	Prior Knowledge	Future learning (KS4)
Year 9 Curriculum Overview - Maths	Spring Term	Rounding • Error intervals	Error intervals Error intervals with truncated decimals	Given an error interval, identify the largest/ smallest area/ perimeter?	Rounding decimals and integers Rounding to significant figures	Finding bounds for calculations
		3D shapes • Representations of 3D shapes	Nets, plans and elevations of 3D shapes	Why do you need more than one piece of information? Construct a 3D shape from elevations	Properties of 3D shapes	Scale drawings
		Pythagoras Theorem • Pythagoras in 2D	Calculating hypotenuse and shortest side using Pythagoras	Combining with area and perimeter both given lengths and finding lengths	Calculating with roots and powers Solving equations	Right angled trigonometry
		Ratio and proportion • Ratio • Proportion word problems	Writing and sharing ratios Direct and inverse proportion Currency conversion	Convert between multiple currencies to identify best value for money.	HCF Using a calculator	Combine ratios Graph of conversions Calculating with ratios and algebra
		Linear graphs • Equations of linear graphs	Finding and interpreting equations of linear graphs	Compare cost vs. time graphs	Read and plot coordinates Plot straight line graphs	Finding equation of a line from a graph and from coordinates
		Compound measures • Speed and rates	Calculating with speed and rates	Convert mph to miles per second. Convert kph to m/s	Substituting into formulae Solving equations Rearranging formulae Converting lengths, mass, capacity	Calculate density and pressure
		Motion-time graphs • Distance-time graph	Plot and interpret distance time graphs Calculating speed from distance time graph		Calculate with speed Equation of straight line graphs	Plot velocity time graphs

		Content	Fluency	Problem solving	Prior Knowledge	Future learning (KS4)
Year 9 Curriculum Overview - Maths	Summer Term	Quadratic graphs • Plotting and interpreting quadratic graphs	Plot and interpret quadratic functions Solve quadratic equations graphically		Substitute into algebraic formulae Plot straight line graphs	Graph of cubic and reciprocal functions
		Angles and bearings • Angles • Bearings	Angles in parallel lines, quadrilaterals and polygons Measure and draw bearings Calculating bearings	What is the reverse bearing? What rules are needed for bearings?	Angles on lines, about a point, vertically opposite, triangles and quadrilaterals	Applying right angled trigonometry to bearings
		Transformations • Transforming shapes	Rotation Enlargement	Describing transformations	Translations and reflections	Enlargement with negative scale factor
		Similarity and congruence • Similarity • Congruence	Understanding similarity and finding unknown lengths in similar shapes Understand congruence and identify congruent triangles Constructing triangles	Compare 2 triangles, with different angles given, are they congruent? Is a square and a rhombus congruent, or similar or neither?	Scale factor for enlargement Identify triangles that have different orientations	Finding perimeter and area of similar shapes Geometry proofs with congruence and similarity
		Handling data and statistical diagrams • Collecting and presenting data • Scatter graphs • Grouped data	Comparing populations using diagrams and averages Plot and interpret scatter graphs Averages from grouped data	Independent investigation to analyse the data	Averages and range Interpreting graphs and charts Reading and plotting coordinates Finding equations of lines Averages from frequency tables	
		Vectors • Column vectors	Four operations with column vectors Identify parallel vectors		Using column vectors with translations	Geometric proofs with vectors

Speak like a Mathematician (Year 9)

Vocabulary	Logo	Definition
Percentage Change		The increase or decrease in a quantity expressed as a percentage of the original value.
Standard Form		A number written in the form a × 10^n, where 1 ≤ a < 10.
Quadratic		An expression, equation or graph whose highest power of x is 2.
Factorise		To write an expression as a product of its factors.
Rearrange		To change the subject of a formula.
Formulae		Mathematical rules that describe relationships between quantities.
Bisector		A line that divides a line segment, angle or shape into two equal parts.
Sector		A region of a circle bounded by two radii and an arc.
Error Interval		The range of values represented by a rounded measurement.

Plan		A view of a 3D object from directly above.
Hypotenuse		The longest side of a right-angled triangle.
Gradient		The steepness of a line, calculated by rise ÷ run.
Bearing		A direction measured clockwise from North.
Similarity		Shapes that have the same shape but different sizes.
Vector		A quantity with both magnitude and direction.
Correlation		The relationship between two variables.

Greater Depth in Key Stage 3

Students who are working at greater depth will be able to consistently and accurately complete fluency questions across a number of strands of maths and use these skills to apply in a problem solving context. These questions may require many strands of maths and there may be multiple routes to the same outcome.

Examples of greater depth questions

Lottie has a bag of apples.

She gives half of them to Fred.

Fred eats two and then has four left.

How many apples did Lottie have at the start?

Janice has three coins in her pocket, and they are all different from each other.

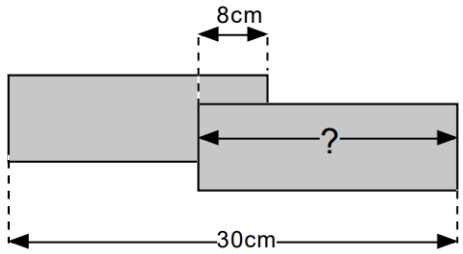
Jeremy has three coins in his pocket and they are all the same as each other.

Jeremy has twice as much money as Janice.

What are the coins they each have?

Two identical rectangular tiles are arranged to overlap each other by 8cm.

The length of the whole arrangement is 30cm.

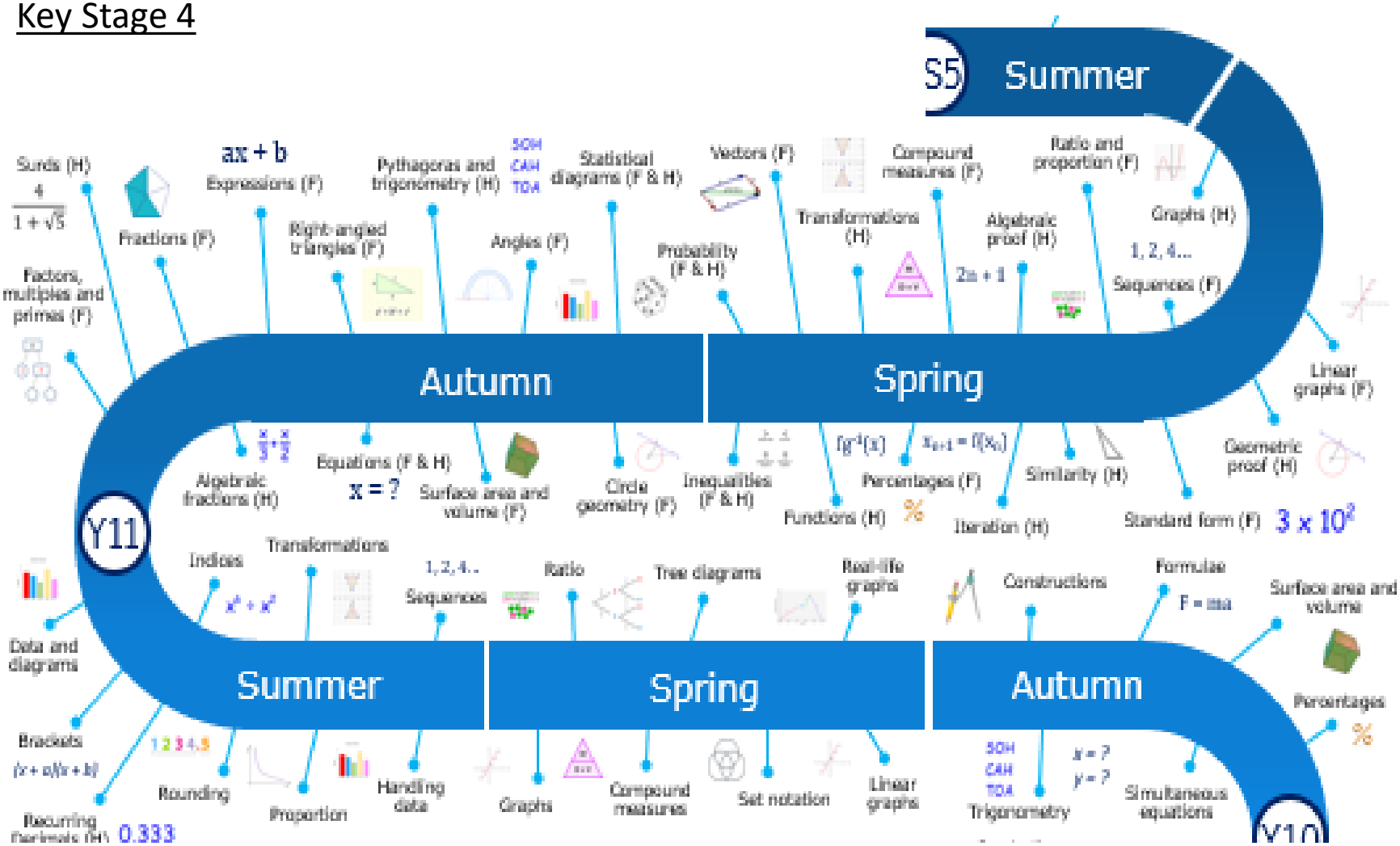


not drawn to scale

Work out the length of a tile.

Students working at greater depth will continue to hone these skills throughout Key Stage 4 which would also support accessing Core Maths at Key Stage 5.

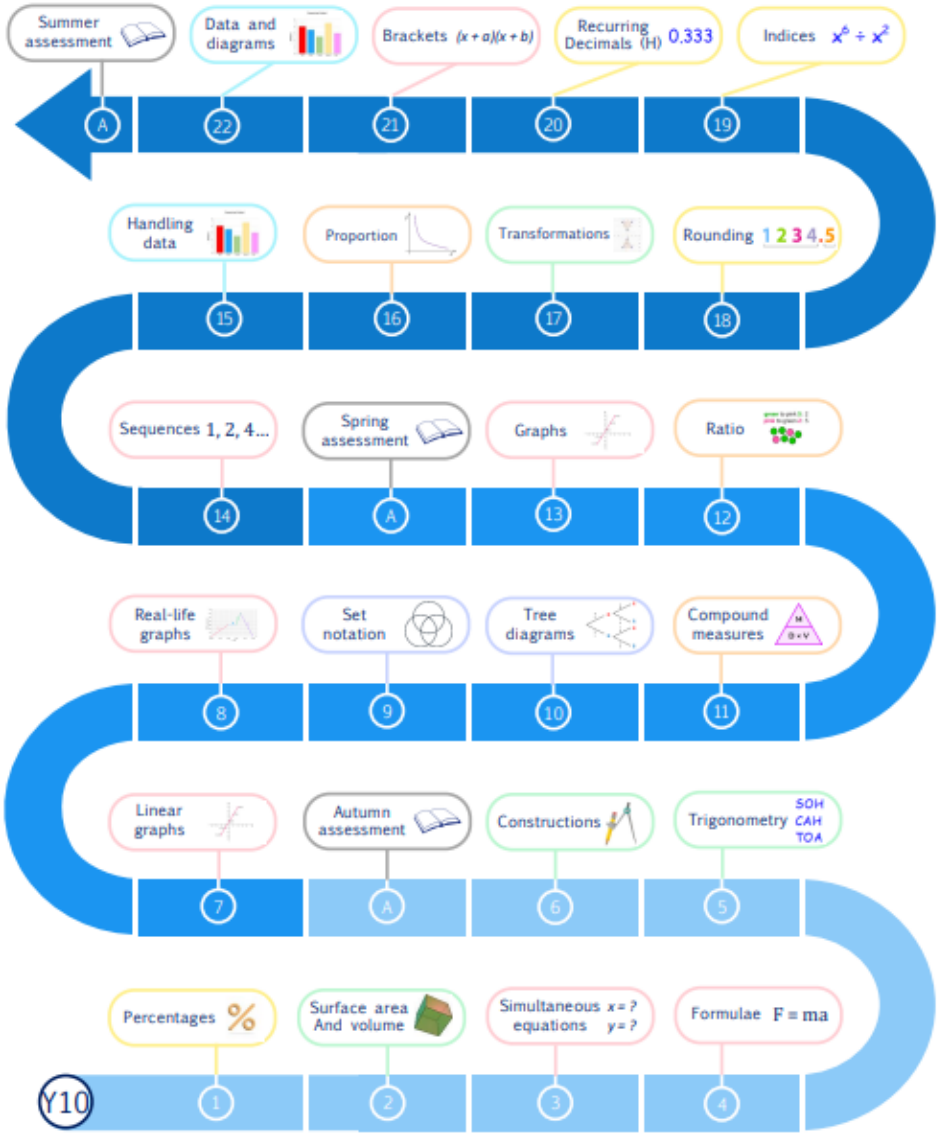
Key Stage 4



All students learn the same content until Year 10 Summer, when tiers of learning then differ. This allows all students to master core knowledge that enables them to further develop mathematical ideas (Higher tier) or continue to master to the national expected standard (Foundation tier).

MATHS LEARNING PATHWAY
YEAR 10

Sir John Talbot's schoo



Strand key:

Number | Algebra | Geometry | Probability | Statistics | Ratio & Proportion

		Content	Fluency	Problem solving	Prior Knowledge (KS2/3)	Future learning
Year 10 Curriculum Overview - Maths	Autumn Term	Percentages • Percentage change	Calculate with compound interest Growth and decay	A ball bounces at a height of 60% it's original height, how many bounces until it stops?	Percentage change with a calculator Finding original values in percentage calculations	
		Surface area and volume • Surface area • Volume	Finding surface area of pyramids, cones, sphere, frustums Finding volume of pyramids, cones, spheres, frustums	If a cube has the same volume of a sphere, what is the surface area of a cube if the sphere has a volume of 48π?	Finding surface area and volume of cubes, cuboids, prisms, cylinders Use of a calculator Rearranging formulae	Use of trigonometry and Pythagoras to find missing lengths
		Simultaneous equations • Linear simultaneous equations	Solving simultaneous equations algebraically Solving simultaneous equations graphically	Form equations from worded scenario to then solve	Solve equations including with unknowns on both sides Construct and solve equations	Simultaneous with a quadratic and linear
		Formulae • Rearranging formulae	Change the subject of the formulae	Combine more than one formulae	Solve equations Expand and factorise brackets	Apply to non-right angled trigonometry to find missing values, and volume, surface area formulae.
		Trigonometry • Right angled trigonometry	Finding lengths using SOHCAHTOA Finding angles using SOHCAHTOA	Angles of elevations and depression Calculating with bearings	Calculate with roots and powers Solving equations Angles in triangles Rearranging formulae Bearings	Non right angled trigonometry
		Constructions • Constructions and loci	Constructing loci	Multi-step constructions to create regions	Construct bisector of angles and lines	

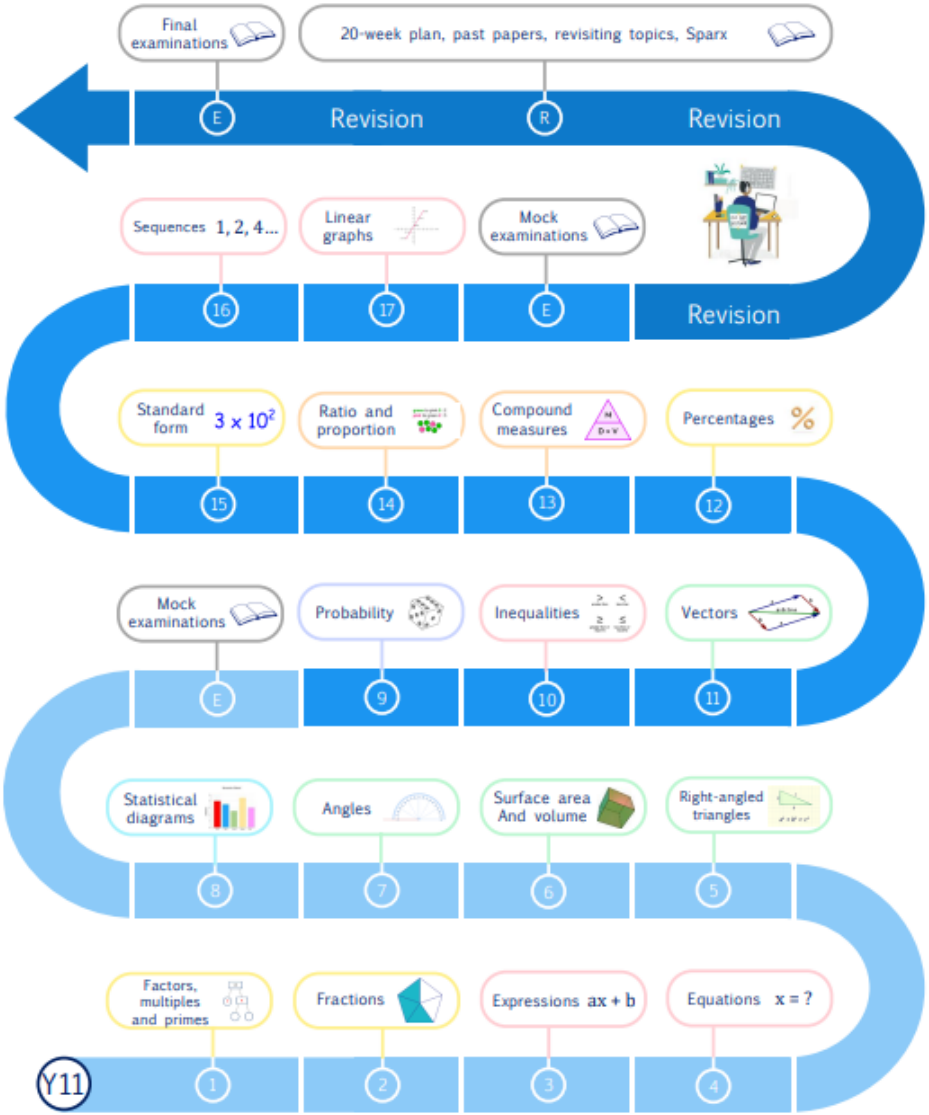
		Content	Fluency	Problem solving	Prior Knowledge (KS2/3)	Future learning
Year 10 Curriculum Overview - Maths	Spring Term	Linear graphs • Equations of linear graphs	Equations of straight lines from gradients and points Equations of parallel lines Equations of perpendicular lines (H)	Prove that two lines are perpendicular to each other? Prove that points are on a line.	Finding equations of straight line graphs	Equations of tangents (H)
		Real-life graphs • Plotting and interpreting real-life graphs	Plot and interpret real-life graphs Sketch graphs of water flows	Given a graph, what would the shape of the container be? Is there more than one answer?	Plot straight line graphs Equations of straight line graph	Area under a curve (H)
		Set notation • Venn diagrams and set notation	Venn diagrams with set notation	Identify probabilities given one criteria, how does this impact the denominator?	Venn diagrams with HCF Probabilities as FDP Factors/ multiples	Developed at KS5
		Tree diagrams • Independent and dependent events	Tree diagrams for independent and dependent events	How/ why do probabilities change with one option is removed on the second occasion?	Multiplying fractions Probabilities as FDP	Applying probabilities with algebra where the total is not given
		Density and pressure • Calculating with density • Calculating with pressure	Calculating with density and pressure	A prism has a stated cross-sectional area, and a density. What is the height of the prism?	Substituting Converting units Solve equations Changing the subject	Developed at KS5 (and cross-curricular with science)
		Ratio • Working with ratio and algebra	Combining ratio Calculate ratios and algebra	There are an unknown number of counters in the box. Half the counters are red, two fifths are blue, the rest are green. Write this as a ratio of r:b:g.	Writing and simplifying ratio Equivalent ratios Convert between ratio, fraction, percentages	Vector proofs with ratio (H)
		Graphs • Velocity-time graph • Cubic, reciprocal, exponential graphs	Plot velocity-time graphs. Calculate acceleration from graphs Plotting graphs of cubic and reciprocals Graphs of exponential functions (H)	Identify which type of graph using knowledge of key features.	Plotting distance-time graphs Plotting graphs of quadratic functions	Trigonometric graphs (H)

		Content	Fluency	Problem solving	Prior Knowledge (KS2/3)	Future learning
Year 10 Foundation Curriculum Overview - Maths	Summer Term	Sequences • Arithmetic and geometric sequences	Position to term for arithmetic and geometric sequences	Position to term and nth term of patterns	Term to term rules Substitution	Nth term of quadratic sequences (H)
		Handling data • Sampling	Sampling and bias	Which is the best type of sampling, why? Does it depend on the scenario?	Solving direct proportion word problems	Developed at KS5
		Proportion • Direct and inverse proportion	Interpret direct and inverse proportion equations Graphs of direct and inverse proportions		Solve direct and inverse proportion word problems	Forming direct and inverse proportion equations (H)
		Transformations • Transforming shapes	Combining transformations Describing transformations	Multi-step transformations	Translation, reflection, rotation, enlargement	Enlargement of fractional and negative scale factors (H)
		Rounding • Error intervals	Finding error intervals of integers, decimals and truncated numbers	A decimal has an error interval of $2.3 \leq n < 2.4$ when truncated but an error interval of $2.395 \leq n < 2.405$ when rounded to 3 significant figures, what could the decimal be?	Rounding integers and decimals to significant figures	Calculating with bounds (H)
		Indices • Index Laws	Index laws with positive and negative indices		Calculating with roots and powers Simplifying fractions	Evaluate indices with negative and fractions (H)
		Brackets • Expanding and factorising brackets	Expand double brackets Factorise quadratic equations Solve quadratics by factorising	Expressions of area and perimeter of compound shapes	Find HCF Expand and factorise single brackets Simplify expressions by collecting like terms	Expand triple brackets Solve quadratics by completing the square and using the formula (H)
		Handling data and statistical diagrams • Grouped data • Draw and interpret statistical diagrams	Finding averages from grouped data Draw and interpret stem and leaf, line graphs, frequency polygons	Why is it an estimate of the mean?	Finding averages from frequency tables Draw and interpret bar charts	Histograms from unequal class intervals (H)

		Content	Fluency	Problem solving	Prior Knowledge (KS2)	Future learning
Year 10 Higher Curriculum Overview - Maths	Summer Term	Sequences • Quadratic and geometric sequences	Position to term of quadratic sequences Position to term of geometric sequences	Position to term and nth term of patterns	Substitution Position to term of arithmetic sequences	
		Handling data • Sampling	Sampling and bias Capture-recapture	Which is the best type of sampling, why?	Solve direct proportion word problems	
		Proportion • Direct and inverse proportion	Construct direct and inverse proportion equations Graphs of direct and inverse proportion	Give 5 examples of direct, and 5 inverse proportion scenarios	Solve direct and inverse proportion word problems Currency conversion	
		Transformations • Transforming shapes	Enlargement by a positive and negative scale factor Combining transformations	Multi-step transformations	Translation, reflection, rotations. Describe transformations	
		Rounding • Bounds	Finding bounds for calculations	Give an example of a decimal with different error bounds that is the same original number.	Finding error intervals Error intervals for truncated numbers	
		Indices • Index Laws	Estimating roots and powers Indices in the form $\frac{1}{a}$ and $\frac{a}{b}$	The answer is $\frac{1}{32}$. How many questions with indices can you write?	Calculating with roots and powers Index rules with positive and negative indices	
		Recurring decimals • Fractions and recurring decimals	Convert between fractions and recurring decimals	Calculate $0.\dot{5} + \frac{2}{5}$	Written methods to divide with decimals Solving equations	
		Brackets • Expanding and factorising brackets	Expand triple brackets Complete the square Factorise and then solve quadratics in the form $ax^2 + bx + c = 0$	Expressions of area and perimeter of compound shapes	Expanding double brackets Factorise and solve equations in the form $x^2 + bx + c = 0$	Developed at KS5
		Handling data and statistical diagrams • Cumulative frequency graphs • Box plots	Plot and interpret cumulative frequency graphs from grouped data Use box plots to represent quartiles and compare results	Which data set did better? Which is the best measure of spread – range or IQR?	Interpret frequency tables with grouped data Calculating median and mode	Developed at KS5

MATHS LEARNING PATHWAY
YEAR 11 – Foundation tier

Sir John Talbot's school



Strand key:

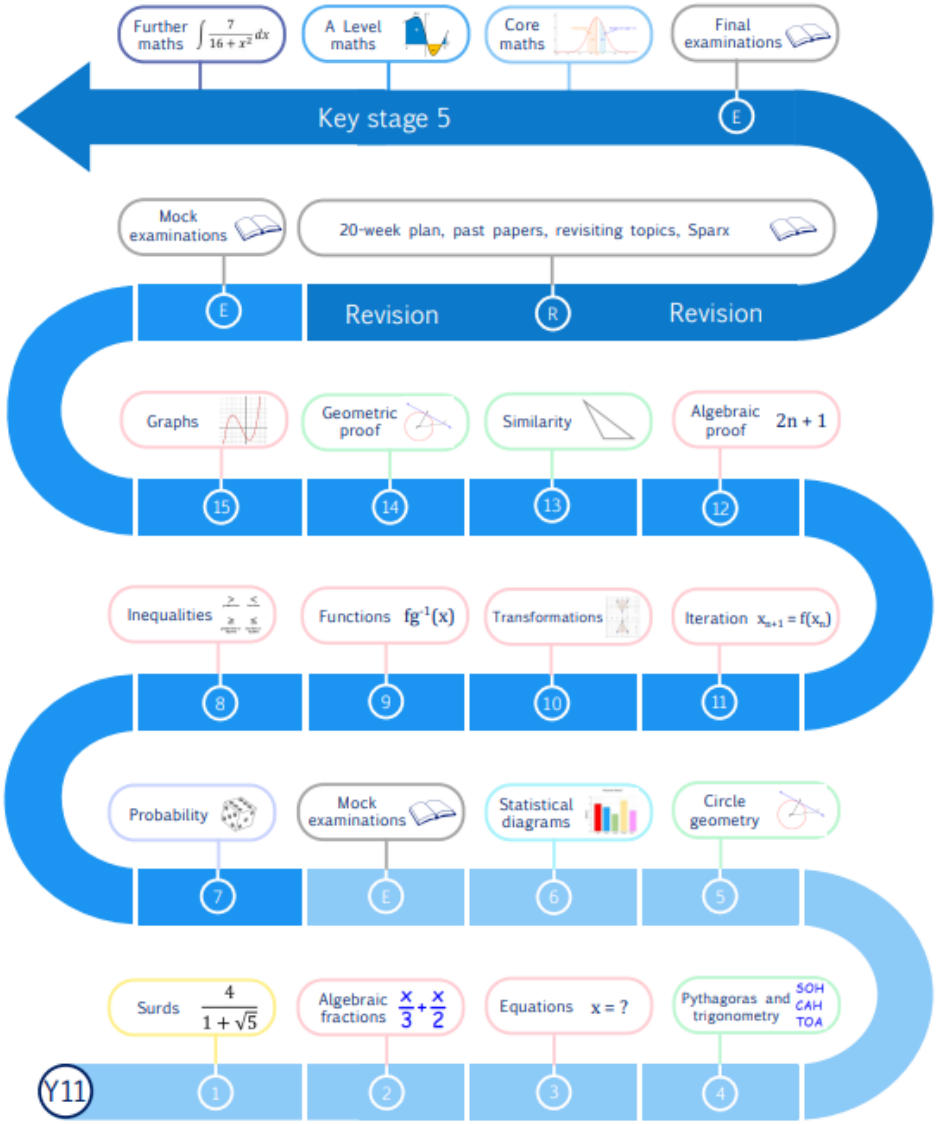
Number | Algebra | Geometry | Probability | Statistics | Ratio & Proportion

		Content	Fluency	Problem solving	Prior Knowledge (KS2/3)	Future learning
Year 11 Foundation Overview - Maths	Autumn Term	Factors, multiples and primes • HCF and LCM	Finding HCF and LCM by listing Finding HCF and LCM using prime number decomposition	Applying HCF/LCM to worded problems where it is necessary to identify which is required.	Factors, multiples and primes. Use of venn diagrams	Factorising quadratics
		Fractions • Fractions and mixed number	Four operations with proper fractions and mixed numbers	Application of fractions to wider areas of maths including area and perimeter	Simplify and order fractions	Applying to different contexts including for rearranging formulae
		Expressions • Simplifying expressions	Simplify using index laws Simplify algebraic fractions using common factors		Index laws for positive and negative indices and simplifying expressions by collecting like terms	Core skills required in most areas of maths
		Equations • Solving equations • Simultaneous equations	Solve equations including with unknowns on both sides, fractions and quadratics Solve algebraic and graphically	Form and solve equations including with angles and perimeter. Form and solve simultaneous equations	Solve equations with one step. Factorising quadratics	
		Angles • Finding unknown angles	Finding, and giving reasons for, angles in parallel lines and polygons		Angles on a line, around appoint, in a triangle, in a quadrilateral	Bearings and problem solving
		Pythagoras and Trigonometry • Pythagoras • Right angled trigonometry	Missing lengths in right angled triangles using Pythagoras Missing lengths and angles using trigonometry	Using bearings for context, and back to back triangles	Solving equations, angles in triangles and parallel lines, measure and draw bearings	Non right angled triangles
		Surface area and volume • Surface area • Volume	Find surface area and volume of prisms and use given formulas for cones, spheres and frustums	Given one measure, work out the other.	Rearranging formula, solve equations, use of a calculator	Rearranging in different forms, giving in terms of pi
		Statistical diagrams • Draw and interpret statistical diagrams	Draw and interpret pie charts and scatter graphs	Compare pie charts to understand it represents proportion	Use of a protractor, frequency tables, bar charts and line graphs	

		Content	Fluency	Problem solving	Prior Knowledge (KS2/3)	Future learning
Year 11 Foundation Curriculum Overview - Maths	Spring Term	Probability • Theoretical and experimental probability	Probabilities from single events, frequency trees, sample space diagrams and venn diagrams Tree diagrams for dependent and independent events	Giving an estimate of outcomes. Comparing number of trials and the accuracy of the results	Writing probabilities as FDP, use of venn diagrams and frequency trees	Conditional probability
		Inequalities • Linear inequalities	Solve single and double inequalities Construct and solve inequalities	When so	Inequalities from a number line, solving equations	Graphing inequalities to identify regions
		Vectors • Vector problems	Add, subtract, multiply column vectors	Solve geometric problems using vectors	Understanding column vectors	Proving two vectors are parallel
		Percentages • Percentage change	Finding percentage change Reverse percentages (finding the original) Compound interest, growth and decay		Finding percentages with and without a calculator	Rearrange to find percentages
		Compound measures • Calculating with compound measures	Calculate with speed, rates, density and pressure	Combining densities, interpreting volume of a prism to find area	Substituting, solving equations, converting units	Developed at KS5
		Ratio and proportion • Working with ratio and algebra • Proportion word problems	Combining ratio Solve direct and inverse proportion questions	Ratio and proportion linked to recipes, conversion graphs, best buys	Simplifying ratio, sharing by a ratio, using a calculator	Formal direct and inverse proportion by finding the k value
		Standard form • Calculating with standard form	Four operations with standard form	Apply to worded problems that require understanding of multiplication and division	Writing numbers in standard form, index rules for positive and negatives	
		Sequences • Arithmetic and geometric sequences	Position to term rules for arithmetic, geometric and special sequences	Apply to algebraic expressions	Finding term to term sequence, substitution	Quadratic sequences
		Linear graphs • Equations of linear graphs	Plot equations of a line from a coordinate table Use y=mx+c to identify gradient and intercepts Find equations of lines with a gradient, from two points and those that are parallel	Are two lines parallel when written in different forms?	Coordinates, substitution, rearranging	Graphical simultaneous equations

MATHS LEARNING PATHWAY
YEAR 11 – Higher tier

Sir John Talbot's school



Strand key:

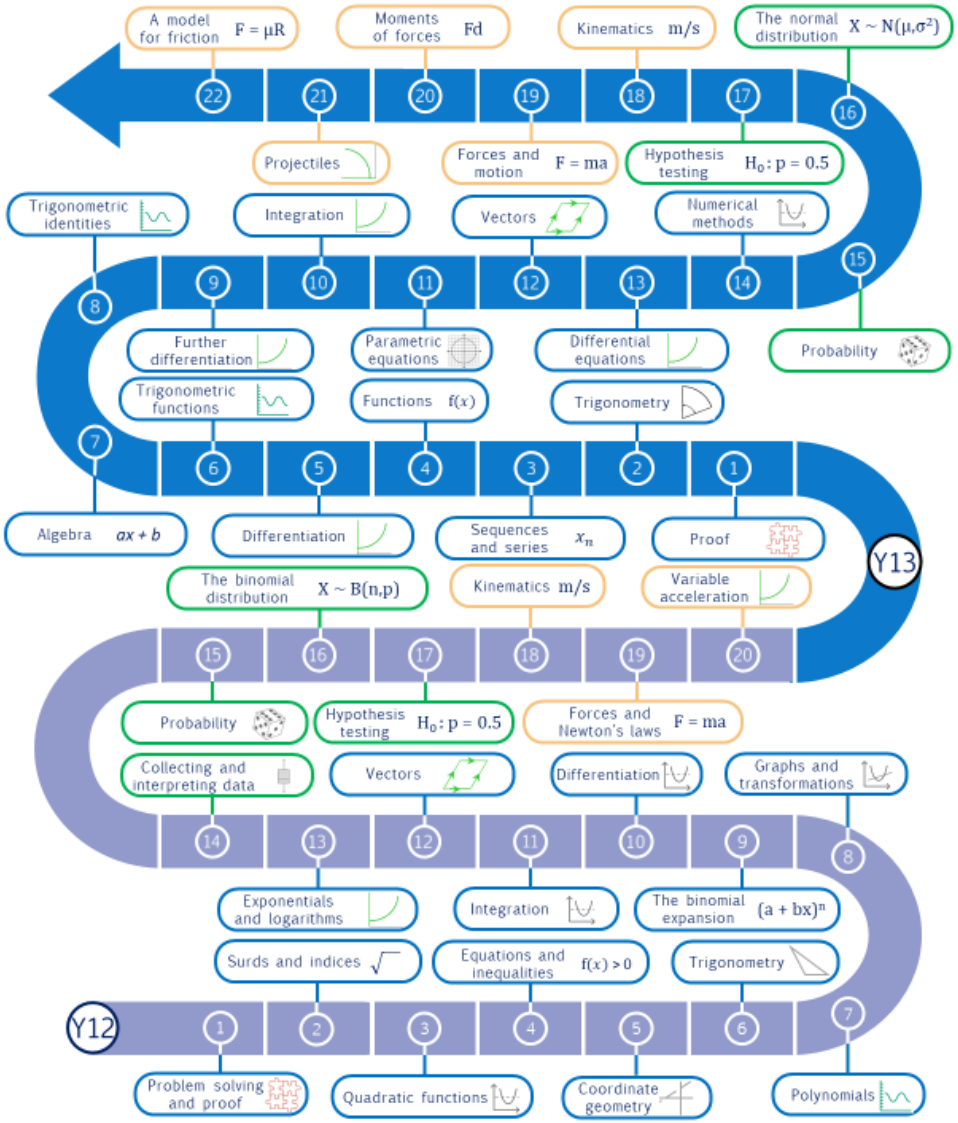
Number | Algebra | Geometry | Probability | Statistics | Ratio & Proportion

		Content	Fluency	Problem solving	Prior Knowledge (KS2/3)	Future learning
Year 11 Higher Overview - Maths	Autumn Term	Surds • Calculating with surds • Rationalising denominator	Simplifying surds Four operations with surds Expanding brackets	Application of right angled trigonometry through non calculator methods	Calculating with roots and powers Expand single and double brackets	Use in other areas of maths particularly in circles and trigonometry
		Algebraic fractions • Calculating with algebraic fractions	Simplify by factorising Four operations with algebraic fractions	Form and solve through worded contexts	Simplify algebraic fractions Factorising quadratics	Developed in KS5
		Equations • Solving quadratic equations • Simultaneous equations	Solve by the formula, complete the square and graphically Solve with quadratics algebraically and graphically	What can be inferred from the completed square regarding turning point, y intercept and solutions?	Factorising quadratics Solve simultaneous equations	Factorising binominals at KS5
		Pythagoras and Trigonometry • Trigonometric ratios and graphs • Non right angled trigonometry • 3D Pythagoras and trigonometry	Understand trig ratios and graphs of trig functions Use of sine rule, cosine rule and area rule Pythagoras and trigonometry in 3D	How to you determine which rule to use? What are the key indicators?	Right angled trigonometry Changing the subject Solving equations Pythagoras in 2D	Developed in KS5
		Circle geometry • Circle theorems	Single and combined angle rules in circles including stating the reason	Application of all previous angle rules	Combined angle facts	Developed in KS5
		Statistical diagrams • Histograms	Draw and interpret histograms with unequal class intervals Averages from histograms	Calculating the median and mean value from a drawn histogram	Interpret frequency tables with grouped data Averages from grouped data	Used accurately in the wider curriculum

		Content	Fluency	Problem solving	Prior Knowledge (KS2/3)	Future learning
Year 11 Higher Curriculum Overview - Maths	Spring Term	Probability • Conditional probability	Conditional probabilities from tables, venn diagrams and tree diagrams Product rule for counting	Probability with algebra where there is an expression for the overall probability	Use of venn diagrams Tree diagrams for independent/ dependent	Developed in KS5
		Inequalities • Linear and quadratic inequalities	Graphs of linear inequalities Solving quadratic inequalities	What inequalities are necessary to create the shaded region?	Solve linear inequalities Plotting linear and quadratic graphs	Linked to form and solve from worded problems
		Functions • Substituting into functions • Finding composite and inverse functions	Substituting into functions and composite functions Finding composite and inverse functions		Substituting into algebraic formulae Changing the subject Expanding single and double brackets	Developed at KS5
		Transformations • Transforming graphs	Translating, reflecting and transforming graphs	With graph and transformed graph, state the change	Substitute into formulae Translation and Reflect	Linked to quadratic graphs
		Iteration • Using iterative formulae	Substitute and find approximate solutions using iterations		Substitute into formulae Changing the subject	Linked to the wider curriculum
		Algebraic proofs • Writing algebraic proofs	Writing algebraic proofs		Expand double brackets Changing the subject	Developed at KS5
		Similarity • Area and volume of similar shape	Perimeter and area of similar shapes Surface area and volume of similar shapes	Use of VSF and ASF in combination with compound measures	Unknown sides in similar shapes Converting units for area and volume	Linked to transformations and enlargements
		Geometric proof • Vector proofs • Geometric proofs	Geometric proofs with vectors Geometric proofs with angles, congruence and similarity	How can you prove a line is parallel?	Column vectors Similarity and congruence	Developed in KS5
		Graphs • Non-linear graphs	Estimating areas and gradients of non linear graphs Equations of circles and tangents	What is the equation of a tangent of a line?	Equations of parallel and perpendicular lines Graphs of cubic, reciprocal, exponential functions	Developed at KS5

A LEVEL MATHS LEARNING JOURNEY
YEAR 12 AND 13

Sir John Talbot's school



Scheme of Learning YEAR OVERVIEW

The Big Picture

Year Group 12

Y12 Mathematics is designed to maximise progression in preparation for Y13 or AS Level outcomes. Many topics presents opportunities to recap on GCSE covered content linking this to brand new A-Level content. All topics give students the chance to extended themselves on the journey to achieving their potential.

Content covered

Pure mathematics: Problem solving, surds and indices, quadratic functions, equations and inequalities, coordinate geometry, trigonometry, polynomials, graphs and transformations, the binomial expansion, differentiation, integration, vectors, exponentials and logarithms.
Statistics: Collecting and interpreting data, probability, the binomial distribution, statistical hypothesis testing.
Mechanics: Kinematics, Newton's laws of motion, variable acceleration.

Implementation

Lessons are split between two members of staff. The Teacher 1 delivers 3 sessions per week and teacher 2 delivers 2 sessions per week. Both teachers deliver Pure Maths modules with a focus on Mechanics from Teacher 1 and Statistics from Teacher 2.

Independence and study skills will be fostered through challenging questions and problems, group and pair work, modelling, homework and PLC after each unit and past paper assessment.

Each unit starts with a student self-reflective log which is revisited after each objective has been taught (may be across a few lessons)

Lessons will be based around developing a deeper understanding of concepts. Reasoning will be developed through the exploration of mathematical patterns and images with a variety of problem-solving methods for just one question. Formal structure to answering A Level questions will be embedded.

Learning to move forward and uncover mathematical ideas from mistakes and misconceptions via true/false, spot the mistake and other reasoning tasks where students are required to make a judgement and justify their answers.

Knowledge organiser will be provided for each block to enable students to recall keywords, facts, formulas and/or formal methods.
WOW moments will occur when students solve complex problems, when the barrier wall disappears, and they have a moment of satisfying clarity (no matter how brief) or spotting a relationship that was previously unseen.

Numeracy and calculator skills specific to A-Level content will be embedded.

Key assessments:

Topic assessments throughout the academic year.

Low-stakes testing.

Live marking during lessons.

January mock examinations.

June mock examinations.

Impact

Students will have increased understanding and confidence in A-Level Maths and be able to apply new skills to a variety of new and challenging mathematical problems. Students will know more and remember more. Students will have developed skills enabling them to manipulate familiar and unfamiliar vocabulary and deduce mathematical content. They will be familiar with a variety of exam questions and be suitably prepared to answer examination style questions. There will be an increase in attainment, evidenced in regular, formal and interleaved assessments.

Scheme of Learning YEAR OVERVIEW

The Big Picture

Year Group 13

Y13 Mathematics is designed to maximise progression in preparation for Y13 Examination and Maths at Degree Level. Many topics presents opportunities to recap on Year 12 covered content linking this to brand new Year 2 A-Level content. All topics give students the chance to extended themselves on the journey to achieving their potential.

Content covered

Pure mathematics: Proof, trigonometry, sequences and series, functions, differentiation, trigonometric functions, algebra, trigonometric identities, further differentiation, integration, parametric equations, vectors, differential equations, numerical methods.
Statistics: Probability, statistical distributions, statistical hypothesis testing.
Mechanics: Kinematics, forces and motion, moments of forces, projectiles, a model for friction.

Implementation

Lessons are split between two members of staff. The Teacher 1 delivers 3 sessions per week and teacher 2 delivers 2 sessions per week. Both teachers deliver Pure Maths modules with a focus on Mechanics from Teacher 1 and Statistics from Teacher 2.

Independence and study skills will be fostered through challenging questions and problems, group and pair work, modelling, homework and PLC after each unit and past paper assessment.

Each unit starts with a student self-reflective log which is revisited after each objective has been taught (may be across a few lessons)

Lessons will be based around developing a deeper understanding of concepts. Reasoning will be developed through the exploration of mathematical patterns and images with a variety of problem-solving methods for just one question. Formal structure to answering A Level questions will be embedded.

Learning to move forward and uncover mathematical ideas from mistakes and misconceptions via true/false, spot the mistake and other reasoning tasks where students are required to make a judgement and justify their answers.

Knowledge organiser will be provided for each block to enable students to recall keywords, facts, formulas and/or formal methods.
WOW moments will occur when students solve complex problems, when the barrier wall disappears, and they have a moment of satisfying clarity (no matter how brief) or spotting a relationship that was previously unseen.

Numeracy and calculator skills specific to A-Level content will be embedded.

Key assessments:

Topic assessments throughout the academic year.

Low-stakes testing.

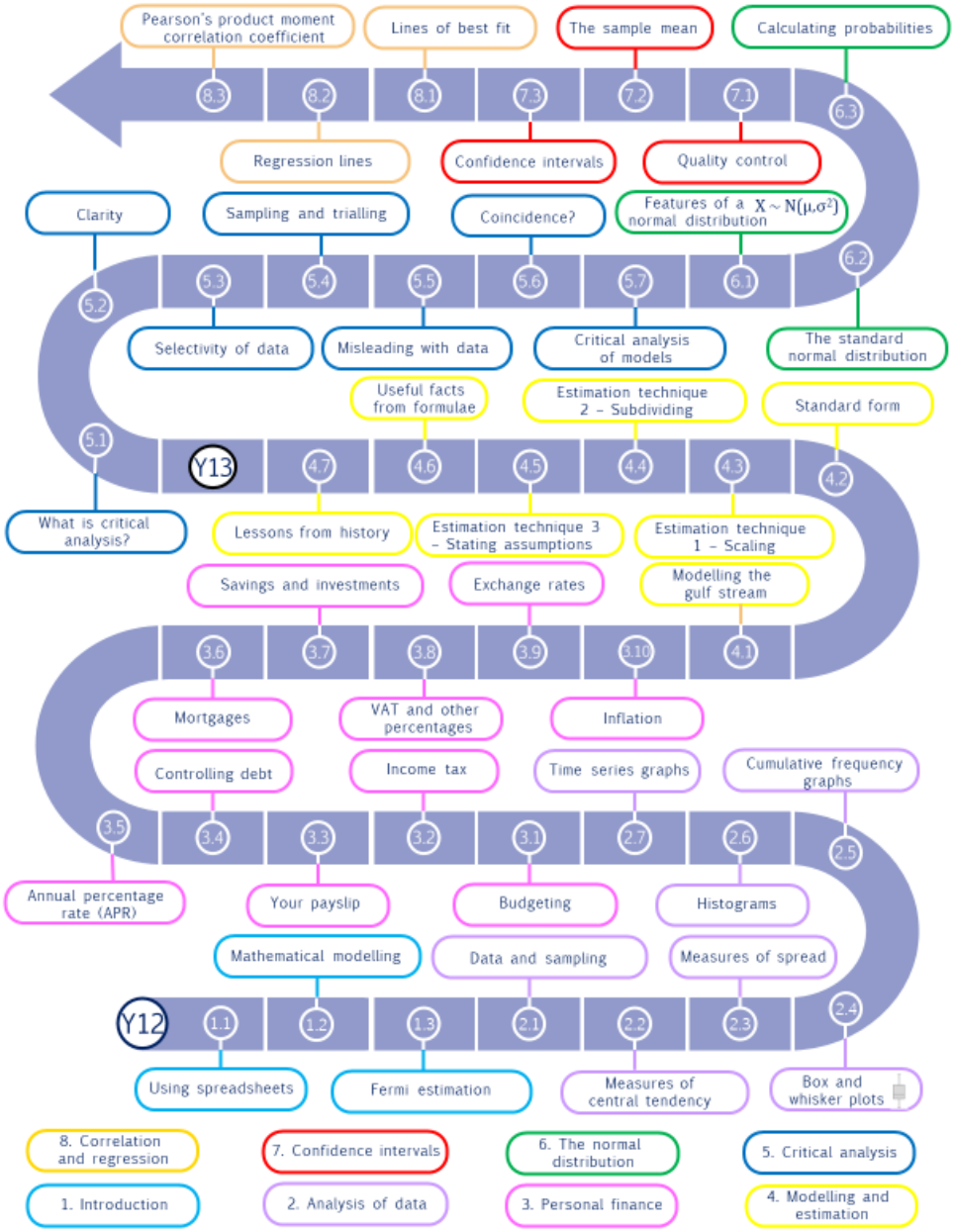
Live marking during lessons.

January mock examinations.

Impact

Students will have increased understanding and confidence in A-Level Maths and be able to apply new skills to a variety of new and challenging mathematical problems. Students will know more and remember more. Students will have developed skills enabling them to manipulate familiar and unfamiliar vocabulary and deduce mathematical content. They will be familiar with a variety of exam questions and be suitably prepared to answer examination style questions. There will be an increase in attainment, evidenced in regular, formal and interleaved assessments.

CORE MATHS LEARNING JOURNEY
YEAR 12 AND 13



Scheme of Learning YEAR OVERVIEW

The Big Picture

Year Group 12& 13

Core Maths is designed to present students with opportunities to explore mathematics in the real world. All topics give students the chance to extended themselves on the journey to achieving their potential.

Content covered – Core Maths

Paper 1: Analysis of data, personal finance, modelling & estimation

Paper 2a: Critical Analysis, The Normal Distribution, Confidence intervals, Correlations & Regression

Implementation

Lessons are split over the two years with two lessons per week.

Independence is encouraged relating work in class with other subjects and real life.

Each unit starts by recapping what students already know from GCSE. For students entering from Foundation tier, scaffolding steps can be implemented to help with the step up.

Lessons will be based around the nuts and bolts of how to answer questions but there is a heavy reliance on reasoning and understanding so as to be able to apply techniques to more unfamiliar contexts.

Learning often uncovers mathematical ideas from mistakes and misconceptions. Spot the mistake and other reasoning tasks where students are required to make a judgement and justify their answers are frequently incorporated.

Unit overviews will be provided for each topic to enable students to track their learning journeys.
WOW moments will occur when students solve complex problems, when the barrier wall disappears, and they have a moment of satisfying clarity (no matter how brief) or spot a relationship that was previously unseen.

Numeracy and calculator skills specific to CORE Maths content will be embedded.

Key assessments:

Topic assessments throughout the academic year.

Low-stakes testing.

Live marking during lessons.

End of year Y12 exams & Y13 mock examinations.

Impact

Students will have increased understanding and confidence in CORE Maths. They will be able to apply new skills to a variety of new and challenging mathematical problems. They will be able to relate the work done in class to other subjects and life outside the classroom. Students will know more and remember more. Students will have developed skills enabling them to manipulate familiar and unfamiliar vocabulary and deduce mathematical content. They will be familiar with a variety of exam questions and be suitably prepared to answer examination style questions. There will be an increase in attainment, evidenced in regular, formal and interleaved assessments.

A LEVEL FURTHER MATHS LEARNING JOURNEY
YEAR 12 AND 13

Sir John Talbot's school

One major option + one minor option OR **Three minor options**

Major options

Major

Mechanics major
Statistics major

The first half of each of these is the same content as a minor option and can be taught in Year 12.

You cannot choose:
Mechanics major + Mechanics minor
Statistics major + Statistics minor

Minor options

Minor

Mechanics minor
Statistics minor
Modelling with algorithms
Numerical methods

These can be taught in either Year 12 or Year 13.

Extra pure
Further pure with technology

AS LEVEL FURTHER MATHS LEARNING JOURNEY
YEAR 12

Core pure is mandatory, choose two AS options

These AS options are available as standalone Level 3 Certificates:

AS Core pure
Statistics a
Numerical methods
Mechanics a
Modelling with algorithms

AS options

AS option

Mechanics a
Statistics a
Modelling with algorithms
Numerical methods

These are suitable for Year 12 and have the same content as the respective A level minor option.

Mechanics b
Statistics b

These are suitable for Year 13 and have the same content as the second half of the respective A level major option.

Scheme of Learning YEAR OVERVIEW

The Big Picture

Year Group 12 (& 13)

Further Mathematics is designed to maximise progression in preparation for Y13 Examination and related degree Level studies. Many topics presents opportunities to recap and build on content covered in A Level Mathematics. All topics give students the chance to extended themselves on the journey to achieving their potential.

Content covered – Further Maths

Core Pure: Matrices, complex numbers, roots of polynomials, sequences and series, Vectors and 3D space.
Statistics: Discrete random variables, discrete probability distributions, bivariate data, Chi-squared tests.
Mechanics: Forces, work, energy and power, impulse and momentum, centre of mass, dimensional analysis.
Modelling with Algorithms: Algorithms, graphs and networks, linear programming, simplex method.

Implementation

Four weekly lessons are split between two members of staff. Both teachers deliver Core Pure content, whilst the applied units are delivered in a way that utilises expertise of staff and maximises the potential of students.

Independence and study skills will be fostered through challenging questions and problems, group and pair work, modelling, homework and PLC after each unit and past paper assessment.

Each unit starts with a student self reflective log which is revisited after each objective has been taught (may be across a few lessons).

Lessons will be based around developing a deeper understanding of concepts. Reasoning will be developed through the exploration of mathematical patterns and images with a variety of problem-solving methods for just one question. Formal structure to answering A Level questions will be embedded.

Learning to move forward and uncover mathematical ideas from mistakes and misconceptions via true/false, spot the mistake and other reasoning tasks where students are required to make a judgement and justify their answers.

Knowledge organisers will be provided for each block to enable students to recall keywords, facts, formulas and/or formal methods.
WOW moments will occur when students solve complex problems, when the barrier wall disappears, and they have a moment of satisfying clarity (no matter how brief) or spotting a relationship that was previously unseen.

Numeracy and calculator skills specific to A Level content will be embedded.

Key assessments:

Topic assessments throughout the academic year.

Low-stakes testing.

Live marking during lessons.

End of year Y12 exams & Y13 mock examinations

Impact

Students will have increased understanding and confidence in A Level Maths and be able to apply new skills to a variety of new and challenging mathematical problems. Students will know more and remember more. Students will have developed skills enabling them to manipulate familiar and unfamiliar vocabulary and deduce mathematical content. They will be familiar with a variety of exam questions and be suitably prepared to answer examination style questions. There will be an increase in attainment, evidenced in regular, formal and interleaved assessments.