

Maths Curriculum Overview



The Maths department's vision is to give students the knowledge and skills that allow them to be numerate and logical when making decisions in the real world.

Our maths curriculum is driven by the whole-school vision to give students the skills, attributes and academic qualifications to go on to live lives of choice and opportunity. In selecting and sequencing knowledge for our curriculum, we are guided by the national curriculum and led by our whole-school curriculum design principles.

1. Knowledge-rich: All through our school, we prioritise teaching fluency in inflexible knowledge (learning key facts to automaticity) before exposing students to reasoning and problem-solving activities. Once students can recall and apply knowledge rapidly and accurately, they can build flexible knowledge that allows them to make connections, choose efficient strategies in more complex tasks and spot deeper connections. We rigorously atomise our learning objectives in schemes of work to ensure students are led from novice to expert via the chunking of new knowledge, and our homework setting via Century and Times Tables Rockstars in Primary and Sparx in

Secondary ensures further individualised practice that allows pupils to develop rapid recall of facts and retrieves prior knowledge systematically.

2. Backwards planned: In our all-through sequencing of our curriculum, we prioritise number/number sense and algebra (from Y7) at the start of each year given their centrality to key concepts within our curriculum. While our curriculum is based in the Maths Mastery Scheme, we have adapted it to suit our context and cohorts. Across phases and years we sequence units to ensure we build on prior knowledge, space the practice of concepts and teach students the relationships between and deeper structures within mathematical topics. We teach forward-facing methods in Maths to ensure, for instance, that our Year 3 curriculum avoids embedding misconceptions about fractions that create barriers to understanding mixed numbers in Upper Key Stage 2, manipulating algebraic fractions in Year 10 or expressing remainder as fractions when completing algebraic long division in Year 12. We build a shared, rigorous vocabulary so that students refer to numerators, denominators and reciprocals from the first time they are taught fractions in Year 3; they will still be using that language in Year 13!

3. Carefully resourced: We continually improve the central resources on our drive each year; we adapt them to the learning needs of our groups, co-plan for mixed attainment groups and use our Schemes of Work to ensure every learning objective is delivered. All-through our school we are aligned about what excellent Maths teaching looks like: employing explicit instruction, modelling with worked examples and multiple representations (Concrete-Pictorial-Abstract), and using systematic assessment for learning in lessons - our resources reflect this.

We carefully select examples and questions in our independent practice, using scaffolding to ensure our curriculum is accessible to all pupils and interleaving to secure, long-term, deep and adaptable understanding of maths which they can apply in different contexts. All teachers are teachers of literacy: we endeavour to create a vocabulary rich environment where teachers explicitly teach mathematical vocabulary, model using vocabulary accurately in sentence stems and have high expectations for pupils to actively listen and speak in full sentences.

4. Aspirational, inclusive and diverse: Aspiration in our curriculum is seen in our high expectations of pupils, the depth we expose our students to in lessons - stretch and challenge is not just an add-on to a worksheet, it is embedded in the rigour of our Schemes of Work - and our explicit teaching of reasoning and problem-solving problems. We draw from NCETM, UKMT, White Rose Maths and Maths No Problem to enrich our students' mathematical experience. At Reach, we have a school culture where learning, working hard and succeeding is viewed positively by the pupil body. Pupils are encouraged to believe that they 'can do' maths and mistakes are seen as an

opportunity to learn and grow. There is a sense of joy in maths lessons and this is evident through the pace of lessons, the use of choral response, partner talk, songs to learn times tables in primary and the celebration of pupil work.

We support and ensure our curriculum is inclusive for pupils with a range of needs first and foremost through high quality teaching: this means explicit instruction, scaffolding, adapting teaching according to assessment for learning to help more pupils learn, providing learners with worked examples and using diagrams to accompany explanations (dual coding). Our scaffolding is evident in our exposition, questioning and through use of concrete aids where appropriate. We differentiate by time, not task, by pitching high and scaffolding up. As a small school, we know our pupils and their needs very well, using the Graduated Approach to trial in-lesson interventions with our SENCo.

Diversity in the curriculum can be achieved by taking opportunities to teach students about the history of Mathematics and its diverse origins; from our numerals, the development of algebra and the source of our place value systems. Hooks at the start of topics provide the key way to ensure diversity in our curriculum is not tokenistic, but embedded in our practice.

5. Rigorously assessed: We systematically assess pupils (i) in lessons by teaching responsively through a range of AFL strategies, (ii) through low-stakes assessments from Maths Meetings to Quizzing, and (iii) in formal assessments three times a year (twice a year from Y10-Y13) after which we deliver whole-class feedback.

In Primary, Maths Meetings (additional to maths lessons) are a means of retrieval practice used to recap previously taught topics and are planned meticulously, considering spacing and interleaving of practice. In Secondary, this transforms into Quizzing - a form of weekly retrieval practice that builds independence and gives students practice at key revision techniques. Our low-stakes assessments are a key way of seeking and, via whole class feedback, closing gaps in knowledge. Across the school, Do Nows at the start of the lesson complement this retrieval practice.

Formal assessments provide robust student data that can be used formatively to re-teach content identified in QLAs through WCF and summatively to consider the snapshot of attainment and progress at that time.

6. Regularly evaluated and reflected upon. We use structures such as subject management, department meeting time and Pupil Progress Meetings after formal assessments to frequently reflect on our maths curriculum. We consider its design, its resourcing, its implementation and its impact; making changes immediately or logging them for the next academic year.

Curriculum Map: Nursery

Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
Number Rhymes	Cardinality and Counting Shape	Cardinality and Counting Shape	Cardinality and Counting	Shape and Space Measures	Consolidation
<ul style="list-style-type: none"> Manipulating fingers to show numbers <p>Songs they will learn:</p> <ul style="list-style-type: none"> - Way up high in the apple tree - 5 little monkeys jumping on the bed - 5 little men flying in a saucer - 5 elephants - 5 green and speckled frogs 	<ul style="list-style-type: none"> Learning number names of numbers 1-6 <ul style="list-style-type: none"> Numeral recognition Counting backwards and starting from different numbers Learning about different shapes: circles, rectangles, triangles, squares and pentagons. Describing properties of shape 	<ul style="list-style-type: none"> Learning number names of numbers 7-10 <ul style="list-style-type: none"> Numeral recognition Counting backwards and starting from different numbers Looking for numbers and shapes in the environment. <ul style="list-style-type: none"> Shape awareness: developing shape awareness through construction 	<ul style="list-style-type: none"> Counting using one to one correspondence <ul style="list-style-type: none"> Matching numeral and quantity Number stability <ul style="list-style-type: none"> Adding two numbers (within 10) Subtracting (within 10) 	<ul style="list-style-type: none"> Developing spatial awareness: experiencing different viewpoints Developing spatial vocabulary Representing spatial relationships <ul style="list-style-type: none"> Positional language Measuring Comparing height 	<ul style="list-style-type: none"> Consolidation of key knowledge and skills Learning to use different manipulatives on the carpet (e.g. cubes, counters, ten frames)

Curriculum Map: Reception

	Early Mathematical Experiences	Pattern and Number	Numbers within 6	Addition and subtraction within 6	Measures	Shape and sorting	Calendar and time
Autumn Term	<ul style="list-style-type: none"> Classifying objects based on one attribute Matching equal and unequal sets Comparing objects and sets Ordering objects and sets 	<ul style="list-style-type: none"> Recognise, describe, copy and extend colour and size patterns Count and represent the numbers 1 to 3 Estimate and check by counting 	<ul style="list-style-type: none"> Count up to six objects. One more or one fewer Order numbers 1 – 6 Conservation of numbers within six 	<ul style="list-style-type: none"> Explore zero Explore addition and subtraction 	<ul style="list-style-type: none"> Estimate, order compare, discuss and explore capacity, weight and lengths 	<ul style="list-style-type: none"> Describe, and sort 3-D shapes Describe position accurately 	<ul style="list-style-type: none"> Days of the week, seasons Sequence daily events

	Numbers within 10	Addition and subtraction within 10	Numbers within 15	Grouping and sharing	Doubling and halving	Shape and pattern
Spring Term	<ul style="list-style-type: none"> Count up to ten objects Represent, order and explore numbers to ten One more or fewer, one greater or less 	<ul style="list-style-type: none"> Explore addition as counting on and subtraction as taking away 	<ul style="list-style-type: none"> Count up to 15 objects and recognise different representations Order and explore numbers to 15 One more or fewer Counting and sharing in equal groups Grouping into fives and tens Relationship between grouping and sharing 	<ul style="list-style-type: none"> Counting and sharing in equal groups Grouping into fives and tens Relationship between grouping and sharing 	<ul style="list-style-type: none"> Doubling and halving within 10 Relationship between 	<ul style="list-style-type: none"> Describe and sort 2-D and 3-D shapes Recognise, complete and create patterns

	Numbers within 20	Addition and subtraction within 20	Money	Measures	Depth of numbers within 20
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Summer Term	<ul style="list-style-type: none"> •Odds and evens within 10 •Count up to 10 objects •Represent, order and explore numbers to 15 •One more one less •Estimate and count •Grouping and Sharing •Odds and evens within 20 	<ul style="list-style-type: none"> •Commutativity •Explore addition and subtraction •Compare two amounts •Relationship between doubling and halving 	<ul style="list-style-type: none"> •Coin recognition and values •Combinations to total 20p •Change from 10p 	<ul style="list-style-type: none"> •Describe capacities •Compare volumes •Compare weights •Estimate, compare and order lengths 	<ul style="list-style-type: none"> •Explore numbers and strategies •Recognise and extend patterns •Apply number, shape and measures knowledge •Count forwards and backwards
	<p>Assessment</p> <p>→ End of Summer Term Assessment</p> <p>→ Reception Summer PUMA (Progress in Understanding Mathematics) Assessment (no strict time limit)</p>				

Curriculum Map: Year 1

	Week 1	Week 2	Week 3	Week 4	Week 5	Week 6	Week 7	Week 8	Week 9	Week 10
	Number to 10		Addition and subtraction within 10		Shape and Patterns		Numbers to 20		Addition and subtraction within 20	
Autumn Term	<ul style="list-style-type: none"> •Represent, compare and explore numbers within 10 •One more and one less 		<ul style="list-style-type: none"> •Represent and explain addition and subtraction •Commutativity •Addition and subtraction facts 		<ul style="list-style-type: none"> •Identify, describe, sort and classify 2-D and 3-D shapes •Investigate repeating 		<ul style="list-style-type: none"> •Identify, represent, compare and order numbers to 20 •Doubling and halving •One more and one less 		<ul style="list-style-type: none"> •Represent and explain addition and subtraction strategies including 'Make Ten' •Use known facts to add and subtract 	

	<ul style="list-style-type: none"> less •Doubling and halving 		<ul style="list-style-type: none"> patterns •Use and follow instructional and positional language 		subtract
	<p>Assessment Point 1</p> <p>→ End of Autumn Term Assessment</p> <p>→ Year 1 Autumn PUMA (Progress in Understanding Mathematics) Assessment (60 minutes)</p>				

	Week 1	Week 2	Week 3	Week 4	Week 5	Week 6	Week 7	Week 8	Week 9	Week 10
Spring Term	Time		Exploring calculation strategies within 20	Numbers to 50		Addition and subtraction within 20		Fractions	Measures: length and mass	
	<ul style="list-style-type: none"> •Read, write and tell the time to o'clock and half past on analogue clock •Sequencing daily activities •Whole and half turns linked to time 		<ul style="list-style-type: none"> •Model, explain and choose addition and subtraction strategies 	<ul style="list-style-type: none"> •2-digit numbers – represent, sequence, explore, compare. •Count in 2s, 5s and 10s •Describe and complete number patterns 		<ul style="list-style-type: none"> •Illustrate, explain and link addition and subtraction with equations •Apply 'Make Ten' strategy •Use language to quantify and compare difference 		<ul style="list-style-type: none"> •Identify 1/2 and 1/4 of a shape or object •Find 1/2 and 1/4 of a quantity 	<ul style="list-style-type: none"> •Compare and measure lengths and mass using cm and kg •Doubling and halving 	
	<p>Assessment Point 2</p> <p>→ End of Spring Term Assessment</p> <p>→ Year 1 Spring PUMA (Progress in Understanding Mathematics) Assessment (60 minutes)</p>									

Autumn Term	Numbers within 100	Addition and subtraction of 2-digit numbers	Addition and subtraction problems	Measures: Length	Graphs	Multiplication and division: 2, 5 and 10
	<ul style="list-style-type: none"> •Read, write, represent, partition, compare and order numbers to 100 •Explore patterns including, odds and evens, tens and ones 	<ul style="list-style-type: none"> •Apply number bonds to add and subtract •Represent and explain addition and subtraction of two 2-digit numbers. •Add three 1-digit numbers 	<ul style="list-style-type: none"> •Introduction to bar models as a representation •Create, label and sketch bar models 	<ul style="list-style-type: none"> •Draw and measure lengths in centimetres •Use <, > and = to compare and order lengths in metres and centimetres 	<ul style="list-style-type: none"> •Represent and Interpret: pictograms, block diagrams, tables and tally charts. 	<ul style="list-style-type: none"> •Calculate the times tables of 2, 5, and 10 by skip counting •Relate the 2 times table to doubling •Explore representations of multiplication and division •Commutativity
<p>Assessment Point 1</p> <p>→ End of Autumn Term Assessment</p> <p>→ Year 2 Autumn PUMA (Progress in Understanding Mathematics) Assessment (60 minutes)</p> <p>→ Year 2 Autumn Arithmetic Test</p>						

Spring Term	Week 1	Week 2	Week 3	Week 4	Week 5	Week 6	Week 7	Week 8	Week 9	Week 10	Week 11
	Time		Fractions		Addition and subtraction of 2-digit numbers		Money		Face, shapes and patterns; lines and turns		
	<ul style="list-style-type: none"> •Tell the time on an analogue clock: quarter past, quarter to and five minute intervals •Calculate durations of time in minutes and seconds •Sequence daily events 		<ul style="list-style-type: none"> •Part-whole relationships •Fractions as part of a whole or a whole set •Relate to division 		<ul style="list-style-type: none"> •Illustrate, represent and explain addition and subtraction involving regrouping including 'Make Ten', 'Round and adjust' and near doubles 		<ul style="list-style-type: none"> •Recognise coins and notes •Use £ and p accurately •Add and subtract amounts •Calculate change 		<ul style="list-style-type: none"> •Explore, sort and describe 2-D shapes •Lines of symmetry in 2-D shapes •Identify 2-D shapes on 3-D shapes •Compare and sort 2-D and 3-D shapes •Use language to describe position, direction and rotation to follow a route 		

	•Minutes in an hour and hours in a day	•Equivalent fractions	strategies		
	Assessment Point 2 → End of Spring Term Assessment → Year 2 Spring PUMA (Progress in Understanding Mathematics) Assessment (60 minutes) → Year 2 Spring Arithmetic Test				

	Week 1	Week 2	Week 3	Week 4	Week 5	Week 6	Week 7	Week 8	Week 9
	Numbers within 1000	Measures: capacity and volume		Measures: Mass	Exploring calculator strategies		Multiplication and division : 3 and 4		
Summer Term	<ul style="list-style-type: none"> •Represent in different ways •Compare using symbols •Read scales 	<ul style="list-style-type: none"> •Read and measure temperature •Estimate, measure and understand litres and millilitres •Compare and order capacities 		<ul style="list-style-type: none"> •Weigh and compare masses in kilograms and grams 	<ul style="list-style-type: none"> •Apply addition and subtraction strategies to solve equations •Illustrate and explain addition and subtraction using column method 		<ul style="list-style-type: none"> •Multiplication and division facts for 3 and 4 •Relate 4 times table to doubling the 2 times tables •Describe, interpret and represent using arrays and bar models •Recognise inverse relationship 		
	Assessment Point 3 → End of Summer Term Assessment → Year 2 Summer PUMA (Progress in Understanding Mathematics) Assessment (60 minutes) → Year 2 Summer Arithmetic Test								

	Week 1	Week 2	Week 3	Week 4	Week 5	Week 6	Week 7	Week 8	Week 9	Week 10	Week 11
Autumn Term	Number sense and exploring calculation strategies			Place value		Graphs	Addition and subtraction			Length and perimeter	
	<ul style="list-style-type: none"> •Read, write, order and compare numbers to 100 •Calculate mentally using known facts, round and adjust, near doubles, adding on to find the difference •Derive new facts from a known fact 			<ul style="list-style-type: none"> •Read, write, represent, partition, order and compare 3-digit numbers •Find 10 and 100 more or Less •Round to the nearest multiple of 10 and 100 		<ul style="list-style-type: none"> •Collect, interpret and present data using charts and tables 	<ul style="list-style-type: none"> •Develop and use a range of mental calculation strategies •Illustrate and explain formal written methods – column method 			<ul style="list-style-type: none"> •Measure, draw and compare lengths •Add and subtract lengths •Calculate perimeter 	
	<p>Assessment Point 1</p> <p>→ End of Autumn Term Assessment</p> <p>→ Year 3 Autumn PUMA (Progress in Understanding Mathematics) Assessment (60 minutes)</p> <p>→ Year 3 Autumn Arithmetic Test</p>										

	Week 1	Week 2	Week 3	Week 4	Week 5	Week 6	Week 7	Week 8	Week 9	Week 10
Spring Term	Multiplication and division		Deriving multiplication and division facts		Fractions			Time		
	<ul style="list-style-type: none"> •Multiplication and division facts for 2, 3, 4, 5, 6, 8 and 10 •Multiplicative structures: equal groups/parts, change and comparison, 		<ul style="list-style-type: none"> •Multiply and divide by 10 and 100 •Multiply a 2-digit number by 2, 3, 4, 5 and corresponding 		<ul style="list-style-type: none"> •Part-whole relationships •Fractions as part of a whole or a whole set and as a number •Add, subtract, compare and order 			<ul style="list-style-type: none"> •Tell, record, write and order the time analogue and digital •12-hour, a.m., p.m. •Measure, calculate and 		

	correspondence problems •Relationships: commutativity and inverse	division situations •Divide 2-digit by a 1-digit	fractions	compare durations
	Assessment Point 2 → End of Spring Term Assessment → Year 3 Spring PUMA (Progress in Understanding Mathematics) Assessment (60 minutes) → Year 3 Spring Arithmetic Test			

	Week 1	Week 2	Week 3	Week 4	Week 5	Week 6	Week 7	Week 8	Week 9
Summer Term	Angles and shape			Measures			Securing multiplication and division	Exploring calculation strategies and place value	
	<ul style="list-style-type: none"> •Identify angles including right angles and recognise as a quarter of a turn •Identify and draw parallel and perpendicular lines •Draw/make, classify and compare 2-D and 3-D shapes •Measure the perimeter 			<ul style="list-style-type: none"> •Read scales with different intervals when measuring mass and volume •Weigh and compare masses and capacities with mixed units •Estimate mass and capacity 			<ul style="list-style-type: none"> •Recall and use multiplication and division facts for 6 and 8 times table 	<ul style="list-style-type: none"> •Add and subtract mentally •Find 10, 100 and 1000 more or less •Order and compare beyond 1000 •Round numbers 	
	Assessment Point 3 → End of Summer Term Assessment → Year 3 Summer PUMA (Progress in Understanding Mathematics) Assessment (60 minutes) → Year 3 Summer Arithmetic Test								

Curriculum Map: Year 4

	Week 1	Week 2	Week 3	Week 4	Week 5	Week 6	Week 7	Week 8	Week 9	Week 10
Autumn Term	Reasoning with large numbers		Addition and subtraction			Securing multiplication on facts	Multiplication and division			Time
	<ul style="list-style-type: none"> • 4-digit place value. Read, write, represent, order and compare • Find 10, 100 or 1000 more or less • Round numbers to the nearest 10, 100 or 1000 		<ul style="list-style-type: none"> • Select appropriate strategies to add and subtract • Illustrate and explain appropriate addition and subtraction strategies including column method with regrouping 			<ul style="list-style-type: none"> • Identify and explore patterns in multiplication tables including 7 and 9 	<ul style="list-style-type: none"> • Distributive property including multiplying three 1-digit numbers • Mental multiplication and division strategies using place value and known and derived facts • Short multiplication and division 			<ul style="list-style-type: none"> • Analogue to digital, 12-hour and 24-hour • Convert between units of time
	<p>Assessment Point 1</p> <ul style="list-style-type: none"> → End of Autumn Term Assessment → Year 4 Autumn PUMA (Progress in Understanding Mathematics) Assessment (60 minutes) → Year 4 Autumn Arithmetic Test 									

	Week 1	Week 2	Week 3	Week 4	Week 5	Week 6	Week 7	Week 8	Week 9	Week 10	Week 11
	Discrete and continuous data		Fractions				Decimals			Area and perimeter	

Spring Term	<ul style="list-style-type: none"> •Read, interpret and construct pictograms, bar charts and time graphs •Compare tables, pictograms and bar charts 	<ul style="list-style-type: none"> •Explore different interpretations and representations of fractions <ul style="list-style-type: none"> •Equivalent fractions •Represent fractions greater than one as mixed number and improper fractions •Add and subtract fractions with the same denominator including fractions greater than one 	<ul style="list-style-type: none"> •Decimal equivalents to tenths, quarters and halves •Compare and order numbers with same number of decimal places •Multiply and divide by 10 and 100 including decimals 	<ul style="list-style-type: none"> •Perimeter of rectangles and rectilinear shapes •Area of rectangles and rectilinear shapes •Investigate area and perimeter
	<p>Assessment Point 2</p> <p>→ End of Spring Term Assessment</p> <p>→ Year 4 Spring PUMA (Progress in Understanding Mathematics) Assessment (60 minutes)</p> <p>→ Year 3 Spring Arithmetic Test</p>			

	Week 1	Week 2	Week 3	Week 4	Week 5	Week 6	Week 7	Week 8	Week 9	Week 10
Summer Term	Solving measures and money problems			Shape and symmetry			Position and direction	3-D shape		Reasoning with patterns and sequences
	<ul style="list-style-type: none"> •Convert units of measure •Select appropriate units to measure •Use strategies to investigate problems: trial and improvement, organising using lists and tables, working systematically 			<ul style="list-style-type: none"> •Classify, compare and order angles •Compare and classify 2-D shapes •Identify lines of symmetry 			<ul style="list-style-type: none"> •Describe and plot using coordinates •Describe translations 	<ul style="list-style-type: none"> •Use understanding of 3-D shapes •Identify 3-D shapes from 2-D representations 		<ul style="list-style-type: none"> •Roman numerals up to 100 •Place value of other number systems •Number sequences and patterns
	<p>Assessment Point 3</p> <p>→ End of Summer Term Assessment</p> <p>→ Year 4 Summer PUMA (Progress in Understanding Mathematics) Assessment (60 minutes)</p> <p>→ Year 3 Summer Arithmetic Test</p>									

Curriculum Map: Year 5

	Week 1	Week 2	Week 3	Week 4	Week 5	Week 6	Week 7	Week 8	Week 9	Week 10
Autumn Term	Reasoning with large whole integers		Integer addition and subtraction		Line graphs and timetables		Multiplication and division			Perimeter and area
	<ul style="list-style-type: none"> •Read, write, order and compare numbers up to one million •Round numbers within one million to the nearest multiple of powers of ten •Read Roman numerals up to M 		<ul style="list-style-type: none"> •Use rounding to estimate •Use a range of mental calculation strategies to add and subtract integers •Illustrate and explain the written method of column addition and subtraction •Select efficient calculation strategies 		<ul style="list-style-type: none"> •Complete, read and interpret data presented in line graphs •Read and interpret timetables including calculating intervals 		<ul style="list-style-type: none"> •Identify multiples and factors •Investigate prime numbers •Multiply and divide by 10, 100 and 1000 (integers) •Derived facts •Illustrate and explain formal multiplication and division strategies such as short and long •Use a range of mental calculation strategies 			<ul style="list-style-type: none"> •Investigate area and perimeter of rectilinear shapes •Estimate area of non rectilinear shapes
	<p>Assessment Point 1</p> <p>→ End of Autumn Term Assessment</p> <p>→ Year 5 Autumn PUMA (Progress in Understanding Mathematics) Assessment (60 minutes)</p> <p>→ Year 5 Autumn Arithmetic Test</p>									

	Week 1	Week 2	Week 3	Week 4	Week 5	Week 6	Week 7	Week 8	Week 9	Week 10
Spring Term	Fractions and decimals			Angles		Fractions and percentages			Transformations	
	<ul style="list-style-type: none"> •Read, write, order and compare decimals •Round decimals to the nearest 			<ul style="list-style-type: none"> •Classify, compare and order angles •Measure a draw 		<ul style="list-style-type: none"> •Add, subtract fractions with denominators that are multiples of the same number 			<ul style="list-style-type: none"> •Coordinates in all four quadrants •Translation and reflection 	

	<p>whole number</p> <ul style="list-style-type: none"> •Represent, identify, name, write, order and compare fractions (including improper and mixed numbers) •Calculate fractions of amounts 	<p>angles with a protractor</p> <ul style="list-style-type: none"> •Understand and use angle facts to calculate missing angles 	<ul style="list-style-type: none"> •Multiply fractions (and mixed numbers) by a whole number •Explore percentage, decimal, fractions equivalence 	<ul style="list-style-type: none"> •Calculate intervals across zero as a context for negative numbers
	<p>Assessment Point 2</p> <p>→ End of Spring Term Assessment</p> <p>→ Year 5 Spring PUMA (Progress in Understanding Mathematics) Assessment (60 minutes)</p> <p>→ Year 5 Spring Arithmetic Test</p>			

	Week 1	Week 2	Week 3	Week 4	Week 5	Week 6	Week 7	Week 8	Week 9
	Calculating with whole numbers and decimals			Converting units of measure		2-D and 3-D shape		Volume	Problem solving
Summer Term	<ul style="list-style-type: none"> •Mental strategies to add and subtract involving decimals •Formal written strategies to add, subtract and multiply involving decimals •Multiply and divide by 10, 100 and 1000 involving decimals •Derive multiplication facts involving decimals 			<ul style="list-style-type: none"> •Convert between metric units of length, mass and capacity and units of time •Know and use approximate conversion between imperial and metric 		<ul style="list-style-type: none"> •Classify 2-D shapes and reason about regular and irregular polygons •Properties of diagonals of quadrilaterals •Classify 3-D shapes •2-D representations of 3-D shapes. 		<ul style="list-style-type: none"> •Use cube numbers and notation •Estimate volume •Convert units of volume 	<ul style="list-style-type: none"> •Negative numbers and calculating intervals across zero •Calculating the mean •Interpret remainders •Investigate numbers: consecutive, palindromic, multiples
	<p>Assessment Point 3</p> <p>→ End of Summer Term Assessment</p> <p>→ Year 5 Summer PUMA (Progress in Understanding Mathematics) Assessment (60 minutes)</p>								

Curriculum Map: Year 6

1) Integers and decimals (10 lessons)	2) Multiplication and division (15 lessons)	3) Fractions (10 lessons)	4) Fractions (5 lessons)	5) Missing angles and length (5 lessons)
<ul style="list-style-type: none"> •Represent, read, write, order and compare numbers up to ten million •Round numbers, make estimates and use this to solve problems in context •Solve multi-step problems involving addition and subtraction 	<ul style="list-style-type: none"> •Identify and use properties of number, focusing on primes •Multiply larger integers and decimal numbers using a range of strategies •Divide integers by 1-digit and 2-digit numbers representing remainders appropriately •Illustrate and explain formal multiplication and division strategies 	<ul style="list-style-type: none"> •Deepen understanding of equivalence •Order, simplify and compare fractions, including those greater than one •Recall equivalence between common fractions and decimals •Find decimal quotients using short division •Add and subtract fractions 	<ul style="list-style-type: none"> •Represent multiplication involving fractions •Multiply two proper fractions •Divide a fraction by an integer 	<ul style="list-style-type: none"> •Compare and classify a range of geometric shapes •Use angle facts to find unknown angles
6) Coordinates and shapes (10 lessons)	7) Decimals and measure (15 lessons)	8) Percentage and statistics (10 lessons)	9) Calculation problems (10 lessons)	10) Proportion problems (10 lessons)
<ul style="list-style-type: none"> •Draw a range of geometric shapes using given dimensions and angles •Describe, draw, translate and reflect shapes on a coordinate plane 	<ul style="list-style-type: none"> •Use, read, write and convert between standard units of measures; length, mass, time, money and volume as well as imperial units (c) •Calculate the area of parallelograms and triangles •Calculate, estimate and compare 	<ul style="list-style-type: none"> •Calculate and compare percentages of amounts •Connect percentages with fractions •Explore the equivalence of fractions, decimals and percentages •Calculate the mean •Construct 	<ul style="list-style-type: none"> •Understand the use of brackets •Use knowledge of the order of operations to carry out calculations •Generate and describe linear number sequences 	<ul style="list-style-type: none"> •Use fractions to express proportion •Identify ratio as a relationship between quantities and as a scale factor •Unequal sharing involving ratio

<ul style="list-style-type: none"> •Recognise and construct 3-D shapes •Name and illustrate parts of a circle 	the volume of cuboids	and interpret lines graphs and pie charts •Compare pie charts	<ul style="list-style-type: none"> •Express missing number problems algebraically •Solve equations with unknown values 	
SATs Examinations				
Post SATs (Summer 1)	Year 7 Unit 1 Place Value, Addition and Subtraction of Integers (5 lessons) (Summer 2)	Year 7 Unit 2 Place Value, Addition and Subtraction of Decimals (5 lessons)	Year 7 Unit 3 Multiplication and Division (10 lessons)	Year 7 Unit 4 Order of Operations (5 lessons)
<ul style="list-style-type: none"> • Consolidation and Mastery of Y6 Curriculum • Go Back and Spend More Time on Content (e.g. Drawing a Bar Graph, Accurately Drawing Angles etc.) • Calculator Skills (how to use a calculator) 	<ul style="list-style-type: none"> •Place value integer •Regrouping in base 10 (with integers) •Add and subtract using formal strategies (<i>Commutativity</i>) Round whole numbers to nearest 10, 100 or 1000 	<ul style="list-style-type: none"> •Place value decimals •Regrouping with decimals •Addition and subtraction decimal fluency, worded problems •Round decimals to nearest tenth, hundredth, thousandth 	<ul style="list-style-type: none"> •Multiplying and dividing by multiples of 10 •Use formal methods (grid) for multiplication – use <i>product</i> • List multiples and find the LCM • Multiply and divide integers and decimals by integers – use <i>quotient</i> and <i>remainder</i> • List factors and find the HCF • Repeated multiplication: calculate square and cube numbers • Measure time, calculate with time and solve time word problems 	<ul style="list-style-type: none"> • Carry out calculations involving all four operations • Understand and use brackets • Use simple index notation • Find the mean average, interpreting average as "total amount ÷ number of items" and solve word problems involving average (including reverse mean) <i>(Associativity)</i>
Assessment Point 1 → End of Autumn Term Assessment				

→ Year 6 Autumn PUMA (Progress in Understanding Mathematics) Assessment (60 minutes)

→ Year 6 Autumn Arithmetic Test

→ Mock SATs Exams

Assessment Point 2

→ End of Spring Term Assessment

→ Year 6 Spring PUMA (Progress in Understanding Mathematics) Assessment (60 minutes)

→ Year 6 Spring Arithmetic Test

→ Mock SATs Exams

Assessment Point 3

→ End of Summer Term Assessment

→ Year 6 Summer PUMA (Progress in Understanding Mathematics) Assessment (60 minutes)

→ Year 6 Summer Arithmetic Test

Curriculum Map: Year 7

Year 7		
Cycle 1	Cycle 2	Cycle 3
<p style="text-align: center;">Core Knowledge:</p> <ul style="list-style-type: none"> • Positive and negative numbers • Introduction to algebra: expressions, formulae, and equations <ul style="list-style-type: none"> • Working with Units <p style="text-align: center;">Assessment:</p> <p>→ End of Cycle 1 Assessment: Section A (10 mins), Section B and C (40 mins)</p>	<p style="text-align: center;">Core Knowledge:</p> <ul style="list-style-type: none"> • Angles and Shapes • Perimeter and area of 2D shapes • Prime Numbers and Factorisation <p style="text-align: center;">Assessment:</p> <p>→ End of Cycle 2 Assessment: Section A (10 mins), Section B and C (40 mins)</p>	<p style="text-align: center;">Core Knowledge:</p> <ul style="list-style-type: none"> • Understand and use all operations with fractions • Find fraction and percentage of amount • Convert between fraction, decimal and percentages <ul style="list-style-type: none"> • Introduction to ratio <p style="text-align: center;">Assessment:</p> <p>→ End of Cycle 3 Assessment: Section A (10 mins), Section B and C (40 mins)</p>
<p>Curriculum Sequencing:</p> <p>Our all-through curriculum adopts a mastery/spiral approach to promote deep mathematical understanding. We start Year 7 by building on key concepts from KS2 and deepening student understanding of number, while ensuring all our pupils have numerical fluency. Algebra is introduced to encourage students to make further generalisations about the number system. We then deepen rather than accelerate away from knowledge in shape, angles, prime numbers, fractions, percentages, decimals and ratio.</p>		
<p>All core knowledge specified in this overview is contained within the KS3 National Curriculum, subject to some sequencing changes.</p>		

Curriculum Map: Year 8

Year 8		
Cycle 1	Cycle 2	Cycle 3
<p style="text-align: center;">Core Knowledge:</p> <ul style="list-style-type: none"> • Fractions, percentages and ratio • Forming and solving linear equations: with brackets, negative unknowns, unknowns on both sides and fractions <p style="text-align: center;">Assessment:</p> <p>→ End of Cycle 1 Assessment: Section A (10 mins), Section B and C (40 mins)</p>	<p style="text-align: center;">Core Knowledge:</p> <ul style="list-style-type: none"> • Rounding and truncation • Perimeter and area of parallelograms and trapezia • Finding area and circumferences of circles • 3D Shapes and Nets: finding surface area and volume of 3D shapes <p style="text-align: center;">Assessment:</p> <p>→ End of Cycle 2 Assessment: Section A (10 mins), Section B and C (40 mins)</p>	<p style="text-align: center;">Core Knowledge:</p> <ul style="list-style-type: none"> • Linear Sequences • Direct and Inverse proportion • Univariate data (using averages) and Bivariate data (representing data) <ul style="list-style-type: none"> • Basic probability <p style="text-align: center;">Assessment:</p> <p>→ End of Cycle 3 Assessment: Section A (10 mins), Section B and C (40 mins)</p>

Curriculum Sequencing:

Our all-through curriculum adopts a mastery/spiral approach to promote a deep mathematical understanding. In Year 8, we front-load number and algebra topics that embed multiplicative reasoning and build on algebraic manipulation. Then we expand knowledge of 2D shape to circles/parallelograms/trapezia, introduce 3D geometry and build understanding/interpretation of data (using averages and multiple representations of data). We end Year 8 by giving time to probability: working with single-outcome and multiple-outcome events. Students are equipped with the knowledge and skills necessary to move into Phase 4.

All core knowledge specified in this overview is contained within the Key Stage 3 National Curriculum, subject to some sequencing changes.

Curriculum Map: Year 9

Year 9		
Cycle 1	Cycle 2	Cycle 3
<p>Core Knowledge:</p> <ul style="list-style-type: none"> • Indices: rules of indices with integer values • Standard Form: operations with very large and very small numbers • Surds: Decimal Approximation of Roots, rational and irrational numbers, operations with surds • Simple and compound interest, and repeated percentage change <ul style="list-style-type: none"> • Algebraic manipulation <p>Assessment:</p> <p>→ End of Cycle 1 Assessment: Section A (10 mins), Section B and C (40 mins)</p>	<p>Core Knowledge:</p> <ul style="list-style-type: none"> • Formulae: make subject of formula • Linear Inequalities: multiply/divide by negatives • Linear and Non-Linear Sequences • Quadratic expressions and equations; form, solve and understand graphical representations • Linear Graphs: using $y=mx+c$ and solving problems with parallel/perpendicular lines <ul style="list-style-type: none"> • Pythagoras' Theorem, <p>Assessment:</p> <p>→ End of Cycle 2 Assessment: Section A (10 mins), Section B and C (40 mins)</p>	<p>Core Knowledge:</p> <ul style="list-style-type: none"> • Geometric Reasoning, Angle Sum in a Triangle, Interior & Exterior Angles of Polygons <ul style="list-style-type: none"> • Transformations • Similarity (length) • Bearings and Trigonometry <ul style="list-style-type: none"> • Scale drawings and units • Probability: listing outcomes, probability trees, venn diagrams • Working with Data: discrete and continuous, grouped and ungrouped frequency tables, scatter graphs <p>Assessment:</p> <p>→ End of Cycle 3 Assessment: Section A (10</p>

		mins), Section B and C (40 mins)
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Curriculum Sequencing:

Our all-through curriculum adopts a mastery/spiral approach to promote a deep mathematical understanding.

In Year 9, students start by applying their algebraic/number skills to compound interest, standard form and basic laws of indices. Students are then ready to be introduced to key concepts such as irrational numbers, representing algebra as graphs, quadratics and trigonometry. This sequencing constantly consolidates and builds on KS3 knowledge, equipping students with the knowledge and skills required to access GCSE content. We finish by deepening skills of data handling and statistical inference.

All core knowledge specified in this overview is contained within the National Curriculum, subject to some sequencing changes.

Curriculum Map: Year 10

Year 10 Foundation		
Cycle 1	Cycle 2	Cycle 3
<p style="text-align: center;">Core Knowledge:</p> <ul style="list-style-type: none"> • Negative numbers • Units and decimals • Using fractions and converting between fractions, decimals and percentages • Sharing ratio parts and wholes in a ratio; comparing ratios; relating ratios and fractions • Linear equations and inequalities; brackets, fractions and negatives <ul style="list-style-type: none"> • Sequences • Coordinates and linear graphs: parallel lines 	<p style="text-align: center;">Core Knowledge:</p> <ul style="list-style-type: none"> • Solving simultaneous equations <ul style="list-style-type: none"> • Similarity and enlargement • Proportion and multiplicative reasoning; unitary method and ratio tables <ul style="list-style-type: none"> • Compound measures • Real-life graphs; linking gradient and proportion • Expanding and factorising quadratic expressions • Sketching and using quadratic graphs <ul style="list-style-type: none"> • Rules of indices • Standard Form • Simple and compound interest <p style="text-align: center;">Mid-year Assessment (Feb):</p> <p>→ x1 GCSE Style Non-Calculator Paper</p>	<p style="text-align: center;">Core Knowledge:</p> <ul style="list-style-type: none"> • Pythagoras' Theorem, bearings and trigonometry • Constructing algebraic and geometric proof <ul style="list-style-type: none"> • Circles, including arcs and sectors • Surface area and volume of 3D shapes <ul style="list-style-type: none"> • Plans and elevations • Fundamentals of probability • Theoretical and Experimental Probability <ul style="list-style-type: none"> • Product rule for counting • Tree diagrams for independent and dependent events <p style="text-align: center;">End of Year Assessment:</p> <p>→ x1 GCSE Style Calculator Paper</p> <p>→ x1 GCSE Style Non-Calculator Paper</p>
<p>Curriculum Sequencing:</p> <p>In year 10, our Foundation curriculum starts by consolidating and deepening key numerical/algebraic units, before being introduced to geometric topics that rely heavily on algebraic and numerical skills. The sequencing ensures students spend time applying key algebraic and geometric skills to real-life and increasingly unfamiliar contexts. The curriculum ensures that students have sufficient time over the year to practise and embed these important skills</p>		

and concepts; addressing those with lower retrieval strength..

Links to National Curriculum: All core knowledge specified in this overview is contained within the KS4 National Curriculum, subject to some sequencing changes.

Year 10 Higher		
Cycle 1	Cycle 2	Cycle 3
<p>Core Knowledge:</p> <ul style="list-style-type: none"> • Surds: expand binomials and rationalise terms <ul style="list-style-type: none"> • Recurring decimal to fraction • Simple and compound interest problems; finding the rate, number of years and original amount • Non-linear sequences; pictorial and with surds <ul style="list-style-type: none"> • Parallel and perpendicular lines <ul style="list-style-type: none"> • Simultaneous equations • Further quadratics: quadratic formula, completing the square, solving on a graph 	<p>Core Knowledge:</p> <ul style="list-style-type: none"> • Functions • Represent inequalities on a graph; find regions <ul style="list-style-type: none"> • Algebraic fractions • Multi-step and exact value trigonometry problems, with bearings • 3D Pythagoras and trigonometry <ul style="list-style-type: none"> • Trigonometric graphs • Non-right-angled trigonometry • Circles, including arcs and sectors • Similar Length, Area and Volume <p>Mid-year Assessment (Feb):</p> <p>→ x1 GCSE Style Non-Calculator Paper</p>	<p>Core Knowledge:</p> <ul style="list-style-type: none"> • Surface area and volume of complex 3D shapes: pyramid, cone, sphere, frustum <ul style="list-style-type: none"> • Upper and lower bounds <ul style="list-style-type: none"> • Higher ratio • Tree Diagrams for independent and dependent events • Conditional Probability, including Venn Diagrams <ul style="list-style-type: none"> • Algebraic Reasoning and Proof • Quadratic Simultaneous Equations <p>End of Year Assessment:</p> <p>→ x1 GCSE Style Calculator Paper</p> <p>→ x1 GCSE Style Non-Calculator Paper</p>

Curriculum Sequencing:

Our all-through curriculum adopts a mastery/spiral approach to promote a deep mathematical understanding.

In year 10, students start by expanding their use of irrational numbers and applying their use of quadratics in graphical and geometric contexts. Across the year, students practise solving complex equations in a variety of contexts, building on their KS3 skills and knowledge. Students then spend time building their sense of statistics, interweaving the complex algebraic manipulation they have developed.

All core knowledge specified in this overview is contained within the KS4 National Curriculum, subject to some sequencing changes.

L2 Further Maths - Year 10

Cycle 1	Cycle 2	Cycle 3
<p>Core Knowledge:</p> <ul style="list-style-type: none"> • Matrices - multiplying matrices, describing and combining transformations • Number and Algebra 1 - binomial expansion, algebraic surds, product rule for counting, sequences, factorise and manipulate algebraic fractions <p>Assessment:</p> <p>→ x1 Paper 1 style paper, Non-Calc (only)</p>	<p>Core Knowledge:</p> <ul style="list-style-type: none"> • Coordinate Geometry - parallel/perpendicular lines, equation of a line, intersection of two lines, equation of a circle • Number and Algebra 2 - Ratio and percentages, disguised quadratics, simultaneous equations with three unknowns • Functions: domain and range, graphing functions, composite and inverse functions, quadratic and exponential 	<p>Core Knowledge:</p> <ul style="list-style-type: none"> • Calculus: gradient of curve, differentiation to find gradient, tangents and normals, increasing/decreasing functions, second derivative, stationary points • Number and Algebra III: algebraic proofs, factor theorem • Geometry: trigonometric graphs and solving trigonometric equations <p>Assessment:</p> <p>→ x1 full Paper 1</p>

content covered so far)	<p style="text-align: center;">functions</p> <p style="text-align: center;">Assessment:</p> <p>→ x1 Paper 1 style paper, Non-Calc (only content covered so far)</p>	<p>→ x1 Paper 2 style paper, Calc (only content covered so far)</p>
<p style="text-align: center;">Curriculum Sequencing:</p> <p style="text-align: center;">Our all-through curriculum adopts a mastery/spiral approach to promote a deep mathematical understanding.</p> <p>Our L2 Further Maths curriculum builds and deepens content knowledge from the GCSE course across the year. The sequencing first introduces students to new content that requires little prior knowledge, before building on the GCSE Higher content that it runs alongside. By Cycle 3, students are ready to explore more A Level content, preparing them for taking an A-Level in Maths and Further Maths.</p>		
<p style="text-align: center;">All core knowledge specified in this overview is contained within the AQA L2 Further Maths specification, which can be found here: https://filestore.aqa.org.uk/resources/mathematics/specifications/AQA-8365-SP-2018.PDF</p>		

Curriculum Map: Year 11

Year 11 Foundation		
Cycle 1	Cycle 2	Cycle 3
<p style="text-align: center;">Core Knowledge:</p> <p>Algebraic and Geometrical Reasoning:</p> <ul style="list-style-type: none"> • Algebraic Reasoning - develop simple mathematical arguments, show that two expressions are equivalent • Vectors - use of column vectors, adding/subtracting, multiplying by a scalar • Constructions and Loci - use rulers, protractors and compasses to construct perpendicular bisectors, angle bisectors, triangles and loci • Congruence - recognise congruent triangle and prove congruence using SSS, ASA, AAS and RHS <p style="text-align: center;">Assessment:</p> <p>→ Mini mocks - x2 GCSE-style Foundation Non-Calculator and Calculator paper</p>	<p style="text-align: center;">Core Knowledge:</p> <p>Statistics:</p> <ul style="list-style-type: none"> • Basic Statistics - calculate averages for grouped and ungrouped data, use summary statistics to compare datasets • Sampling - understand and describe different types of sampling • Representing Data - choosing appropriate pictorial representation, interpret and construct graphs for time series data • Scatter Graphs - plot and use scatter graphs, interpolate and extrapolate data to make estimates, identify correlation and outliers <p style="text-align: center;">Assessment:</p> <p>→ Mock Examinations; x3 GCSE Foundation style papers (x1 Non-Calculator, x2 Calculator)</p>	<p>In the final cycle before GCSEs start, lessons will focus on revision. This may be done in a range of ways:</p> <ul style="list-style-type: none"> • Reteaching content based on prior assessment results <ul style="list-style-type: none"> • Timed exam practice • Past papers <p style="text-align: center;">Assessment:</p> <p>→ Formal GCSE Examinations</p>

Curriculum Sequencing:

Our all-through curriculum adopts a mastery/spiral approach to promote a deep mathematical understanding.

In year 11, our Foundation curriculum builds on their improved application of number and algebra, starting with abstract algebraic proof. Students then deepen their knowledge of geometry, before spending time developing and deepening their handling of data and statistical reasoning. Revision and re-teaching for formal examinations will be determined via mock examinations and end-of-unit assessments.

All core knowledge specified in this overview is contained within the KS4 National Curriculum, subject to some sequencing changes.

Year 11 Higher		
Cycle 1	Cycle 2	Cycle 3
<p>Core Knowledge:</p> <p>Geometrical Reasoning:</p> <ul style="list-style-type: none"> • Circle Theorems • Vectors and Vector Proofs - use of column vectors, adding/subtracting, multiplying by a scalar, using to prove geometric arguments • Further Transformations - enlarging shapes by fractional and negative scale factors, combining transformations • Constructions and Loci - use rulers, protractors and compasses to construct perpendicular bisectors, angle bisectors, triangles and loci 	<p>Core Knowledge:</p> <p>Statistical Reasoning:</p> <ul style="list-style-type: none"> • Statistics - construct and interpret histograms, cumulative frequency diagrams and boxplots, compare distributions using measures of spread and location • Scatter Graphs - plot and use scatter graphs, interpolate and extrapolate data to make estimates, identify correlation and outliers <p>Functions:</p>	<p>In the final cycle before GCSEs start, lessons will focus on revision. This may be done in a range of ways:</p> <ul style="list-style-type: none"> • Reteaching content based on prior assessment results <ul style="list-style-type: none"> • Timed exam practice • Past papers <p>Assessment:</p> <p>→ Formal GCSE Examinations</p>

<ul style="list-style-type: none"> • Congruence - recognise congruent triangle and prove congruence using SSS, ASA, AAS and RHS <p>Proportional Reasoning:</p> <ul style="list-style-type: none"> • Direct and Inverse Proportion - solving problems involving direct and/or inverse proportion, including quantities proportional to a power or root of another • Compound Measures - speed, density, pressure • Gradient and Area Under a Curve - estimate gradients of curves and areas under graphs, interpret gradients and areas under real-world graphs <p>Assessment:</p> <p>→ Mini Mock Examinations; x2 GCSE-style Higher Non-Calculator and Calculator Paper</p>	<ul style="list-style-type: none"> • Functions - use of function notation, finding inverses, composite functions • Recurrence Relations - use iterative processes and recurrence formulae <p>Algebraic Reasoning:</p> <ul style="list-style-type: none"> • Non-Linear Graphs - polynomial, reciprocal, exponential and trigonometric graphs • Algebraic Proof - develop mathematical arguments and use algebra to construct proofs • Further Quadratics - factorise quadratics with a > 1, completing the square, sketching quadratic functions <p>Assessment:</p> <p>→ Mock Examinations; x3 GCSE Higher style papers (x1 Non-Calculator, x2 Calculator)</p>	
<p style="text-align: center;">Curriculum Sequencing:</p> <p style="text-align: center;">Our all-through curriculum adopts a mastery/spiral approach to promote a deep mathematical understanding.</p> <p style="text-align: center;">In year 11, students are led through geometrical, proportional and statistical reasoning topics, all of which are heavily reliant on their heightened algebraic manipulation. Functions and other non-linear graphs provide the final deepening of algebraic understanding, before time is given for revision and re-teaching for formal examinations, determined via mock examinations and end-of-unit assessments.</p>		

All core knowledge specified in this overview is contained within the KS4 National Curriculum, subject to some sequencing changes.

L2 Further Maths - Year 11		
Cycle 1	Cycle 2	Cycle 3 - Revision
<p>Core Knowledge:</p> <ul style="list-style-type: none"> • Geometry 2 - area of a triangle, sine and cosine rule, lines and planes in three dimensions • Algebra 3 - functions, composite functions, graphs of functions, inverse functions <p>Assessment:</p> <ul style="list-style-type: none"> → x1 full Paper 1, Non-Calc → x1 Paper 2 style paper, Calc (only content covered so far) 	<p>Core Knowledge:</p> <ul style="list-style-type: none"> • Algebra 4 - simultaneous equations, indices, algebraic proof, sequences • Calculus - differentiation, tangents and normals, stationary points <p>Assessment:</p> <ul style="list-style-type: none"> → x1 full Paper 1, Non-Calc → x1 full Paper 2, Calc 	<p>In the final cycle before GCSEs start, lessons will focus on revision. This may be done in a range of ways:</p> <ul style="list-style-type: none"> • Reteaching content based on prior assessment results • Timed exam practice • Past papers <p>Assessment:</p> <ul style="list-style-type: none"> → Formal L2 Further Maths examination
<p>Curriculum Sequencing:</p> <p>Our all-through curriculum adopts a mastery/spiral approach to promote a deep mathematical understanding.</p> <p>Our L2 Further Maths curriculum in Year 11 builds and deepens content knowledge from the GCSE course, as well as introducing students to some more complex topics. Once pupils have developed their GCSE knowledge in geometry, they are led through advanced algebraic skills involving functions, proofs and calculus. This increases pupil understanding at GCSE, and prepares them for taking an A-Level in Maths and Further Maths.</p>		

All core knowledge specified in this overview is contained within the AQA L2 Further Maths specification, which can be found here:
<https://filestore.aqa.org.uk/resources/mathematics/specifications/AQA-8365-SP-2018.PDF>

Curriculum Map: Year 12

Year 12 A Level Mathematics		
Cycle 1	Cycle 2	Cycle 3
<p>Pure Maths Core Knowledge:</p> <ul style="list-style-type: none"> Algebraic Expressions, Equations and Inequalities Quadratics and the discriminant Algebraic Methods and proofs <ul style="list-style-type: none"> Binomial Expansion Straight-Line Graphs and linear/quadratic models <ul style="list-style-type: none"> Circle problems Vectors with geometric problems and modelling Graphs and Transformations <p>Applied Maths Core knowledge:</p> <ul style="list-style-type: none"> Sampling Methods Statistical Measures - Central Tendency and Spread, Standard Deviation and Variance Statistical Diagrams - Histograms, 	<p>Pure Maths Core Knowledge:</p> <ul style="list-style-type: none"> Introduction to differentiation: using the gradient function and modelling Integration: indefinite, definite and area under curves Trigonometric ratios and transforming trigonometric graphs Trigonometric identities and equations <p>Applied Maths Core knowledge:</p> <ul style="list-style-type: none"> Binomial Distribution - Modelling Using the Binomial Distribution, Finding Probabilities for Repeated Independent Events Hypothesis Testing for PMCC - Hypothesis Testing for Positive/Negative Correlation of a Population from a Sample Probability - Laws of Probability, 	<p>Pure Maths Core Knowledge:</p> <ul style="list-style-type: none"> Exponentials functions and modelling <ul style="list-style-type: none"> Laws of and solving logarithms <ul style="list-style-type: none"> Natural logarithms Proofs and Partial Fractions Functions and mappings Graphing inverse and composite functions <ul style="list-style-type: none"> The modulus function Combining transformations <p>Applied Maths Core knowledge:</p> <ul style="list-style-type: none"> Modelling problems, graphical problems <ul style="list-style-type: none"> Moments - uniform bodies, tilting problems, variable centre of mass. Probability Distributions - Tabular Distributions, Probability Mass Functions Correlation and Linear Regression - Product Moment Correlation Coefficient,

<p>Cumulative Frequency, Reading and Interpreting Diagrams</p> <ul style="list-style-type: none"> • Basic principles of mechanics - modelling assumptions, components. • Constant acceleration formulae - SUVAT - involving gravity. • Newton's Second Law of Motion - Pulleys, Connected Particles, Reaction Forces <p>Assessment Point 1:</p> <p>→ Pure Maths Baseline assessment for course suitability in late September</p> <p>→ Applied Content is NOT covered in Assessment Point 1, course suitability is determined through the Pure Mathematics assessment ONLY. In-class Topic Assessments will be used for in-cycle assessment.</p>	<p>Probability Diagrams, Two Way Tables, Venn Diagrams</p> <ul style="list-style-type: none"> • 2D Vectors - component forms, angles above/below axes • Variable Acceleration - Differentiating, Integrating, solving problems involving graphs. <p>Assessment Point 2:</p> <p>→ Adjusted A/S Past/Mock Pure Mathematics Paper including questions only on topics covered.</p> <p>→ One Adjusted A/S Past/Mock Paper on covered Statistics and Mechanics Content</p>	<p>Equation of Regression Line, Interpreting Coefficients</p> <p>Assessment Point 3:</p> <p>→ End of Year Assessment - Full set of A/S Past/Mock Papers for Pure and Applied.</p>
<p>Curriculum Sequencing:</p> <p>Due to the intertwining nature of Mathematics at this level and the higher prerequisite requirements, the sequencing is broadly centred around high-level concepts that allow students to revisit the skills and knowledge they already have before building on these and applying them in new contexts.</p> <p>In some specific cases, the sequencing has been adapted to allow parallel courses to run smoothly and to provide pupils studying multiple strands of Mathematics with the most efficient and practical sequence through their learning. For example, Calculus content on A-Level Mathematics is moved forward in the course to support pupils sitting A-Level Further Mathematics in parallel.</p>		
<p>All core knowledge specified in this overview is contained within the Pearson Edexcel A Level Mathematics (2017) course:</p>		

Curriculum Map: Year 13

Year 13 A-Level Mathematics		
Cycle 1	Cycle 2	Cycle 3
<p>Pure Maths Core Knowledge:</p> <ul style="list-style-type: none"> • Radian measure • Inverse and reciprocal trigonometric functions • Addition & double angle formulae <ul style="list-style-type: none"> • Differentiating all functions • Product, chain and quotient rule <ul style="list-style-type: none"> • Differential equations • Integrating all functions • Integrating by substitution and parts <ul style="list-style-type: none"> • Trapezium rule <p>Applied Maths Core knowledge:</p> <ul style="list-style-type: none"> • Friction - horizontal plane, inclined planes, involving components • Projectiles - horizontal projection, projection at any angle, general projectile formulae. • Application of Forces - static particles, rigid bodies, dynamics & inclined planes. 	<p>Pure Maths Core Knowledge:</p> <ul style="list-style-type: none"> • Parametric equations • Arithmetic & geometric sequences <ul style="list-style-type: none"> • Further binomial expansion • Binomial expansion with partial fractions <ul style="list-style-type: none"> • Numerical methods <ul style="list-style-type: none"> • Vectors <p>Applied Maths Core knowledge:</p> <ul style="list-style-type: none"> • Normal Distribution - Finding Probabilities, Inverse Normal Distribution, Finding Unknown Parameters. • Hypothesis Testing for 'p' for a Binomial Distribution, Finding Critical Values, One-Tailed Tests, Two-Tailed Tests • Normal Distribution - Standard Normal Distribution, Approximating a Binomial Distribution with Large n, Hypothesis 	<p>Pure Maths Core Knowledge:</p> <ul style="list-style-type: none"> • Revision for A-Level examinations <p>Assessment:</p> <p>Formal Examinations for End of Course</p>

<ul style="list-style-type: none"> • Further kinematics - differentiating vectors, vectors in 3D, integrating vectors <p style="text-align: center;">Assessment Point 5:</p> <p>→ Full set of A/S Past/Mock Papers</p>	<p style="text-align: center;">Testing for the Mean of a Normal Distribution.</p> <p style="text-align: center;">Assessment Point 6:</p> <p>→ Full set of A Level Past/Mock Papers</p>	
<p style="text-align: center;">Curriculum Sequencing:</p> <p>Due to the intertwining nature of Mathematics at this level and the higher prerequisite requirements, the sequencing is broadly centred around high-level concepts that allow students to revisit the skills and knowledge they already have before building on these and applying them in new contexts.</p> <p>In some specific cases, the sequencing has been adapted to allow parallel courses to run smoothly and to provide pupils studying multiple strands of Mathematics with the most efficient and practical sequence through their learning. For example, Calculus content on A-Level Mathematics is moved forward in the course to support pupils sitting A-Level Further Mathematics in parallel.</p>		
<p style="text-align: center;">All core knowledge specified in this overview is contained within the Pearson Edexcel A Level Mathematics (2017) course: https://qualifications.pearson.com/en/qualifications/edexcel-a-levels/mathematics-2017.html</p>		