



Maths Curriculum Overview

Our department's vision

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.

What knowledge have we selected in our curriculum and why?

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.



Reach Academy
Feltham
A REACH SCHOOL

Curriculum Maps

See next page for curriculum maps.

Curriculum Maps

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 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 Numeral recognition Counting backwards and starting from different numbers Looking for numbers and shapes in the environment. Shape awareness: developing shape awareness through construction 	<ul style="list-style-type: none"> Counting using one to one correspondence Matching numeral and quantity Number stability 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 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)

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
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

Year 1

	Week 1	Week 2	Week 3	Week 4	Week 5	Week 6	Week 7	Week 8	Week 9	Week 10
Autumn Term	Number to 10		Addition and subtraction within 10		Shape and Patterns		Numbers to 20		Addition and subtraction within 20	
	<ul style="list-style-type: none"> •Represent, compare and explore numbers within 10 •One more and one less •Doubling and halving 		<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 patterns •Use and follow instructional and positional language 		<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 	

	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 		<ul style="list-style-type: none"> •Model, explain and choose addition and subtraction 		<ul style="list-style-type: none"> •2-digit numbers – represent, sequence, explore, compare. •Count in 2s, 5s and 10s 		<ul style="list-style-type: none"> •Illustrate, explain and link addition and subtraction with equations •Apply 'Make Ten' strategy 		<ul style="list-style-type: none"> •Identify 1/2 and 1/4 of a shape or object •Find 1/2 and 1/4 		<ul style="list-style-type: none"> •Compare and measure lengths and mass using cm and kg

<ul style="list-style-type: none"> •Sequencing daily activities •Whole and half turns linked to time 	strategies	<ul style="list-style-type: none"> •Describe and complete number patterns 	<ul style="list-style-type: none"> •Use language to quantify and compare difference 	of a quantity	<ul style="list-style-type: none"> •Doubling and halving
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	Week 1	Week 2	Week 3	Week 4	Week 5	Week 6	Week 7	Week 8	Week 9	Week 10
Summer Term	Numbers 50 to 100 and beyond		Addition and subtraction		Money		Multiplication and division		Measures: capacity and volume	
	<ul style="list-style-type: none"> •Read, write, represent, compare and order numbers to 100 •One more / fewer, ten more / fewer •Identify number patterns 		<ul style="list-style-type: none"> •Explore addition and subtraction involving 2-digit numbers and ones •Represent and explain addition and subtraction with regrouping •Investigate number bonds within 20 		<ul style="list-style-type: none"> •Name coins and notes and understand their value •Represent the same value using different coins •Find change 		<ul style="list-style-type: none"> •Share equally into groups •Doubling •Link halving to fractions •Add equal groups •Explore arrays 		<ul style="list-style-type: none"> •Compare capacities, volumes and lengths •Explore litres •Apply understanding of fractions to capacity 	

Year 2

	Week 1	Week 2	Week 3	Week 4	Week 5	Week 6	Week 7	Week 8	Week 9	Week 10	Week 11	Week 12
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 						

	Week 1	Week 2	Week 3	Week 4	Week 5	Week 6	Week 7	Week 8	Week 9	Week 10	Week 11
Spring Term	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 Minutes in an hour and hours in a day 		<ul style="list-style-type: none"> Part-whole relationships Fractions as part of a whole or a whole set Relate to division Equivalent fractions 		<ul style="list-style-type: none"> Illustrate, represent and explain addition and subtraction involving regrouping including 'Make Ten', 'Round and adjust' and near doubles strategies 		<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 		

	Week 1	Week 2	Week 3	Week 4	Week 5	Week 6	Week 7	Week 8	Week 9
Summer Term	Numbers within 1000	Measures: capacity and volume		Measures: Mass	Exploring calculator strategies		Multiplication and division : 3 and 4		
	<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 		

Year 3

	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 	

	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 		<ul style="list-style-type: none"> •Multiply and divide by 10 and 100 •Multiply a 2-digit number by 2, 3, 4, 5 and 			<ul style="list-style-type: none"> •Part-whole relationships •Fractions as part of a whole or a whole set and as a number 			<ul style="list-style-type: none"> •Tell, record, write and order the time analogue and digital •12-hour, a.m., p.m. 	

	<ul style="list-style-type: none"> •Multiplicative structures: equal groups/parts, change and comparison, correspondence problems •Relationships: commutativity and inverse 	<p>corresponding division situations</p> <ul style="list-style-type: none"> •Divide 2-digit by a 1-digit 	<ul style="list-style-type: none"> •Add, subtract, compare and order fractions 	<ul style="list-style-type: none"> •Measure, calculate and compare durations
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	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 	

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 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

	Week 1	Week 2	Week 3	Week 4	Week 5	Week 6	Week 7	Week 8	Week 9	Week 10	Week 11
Spring Term	Discrete and continuous data		Fractions				Decimals			Area and perimeter	
	<ul style="list-style-type: none"> • Read, interpret and construct pictograms, bar charts and time graphs • Compare 		<ul style="list-style-type: none"> • Explore different interpretations and representations of fractions • Equivalent fractions • Represent fractions greater than one as mixed number and improper fractions 				<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 	

	tables, pictograms and bar charts	•Add and subtract fractions with the same denominator including fractions greater than one		perimeter
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	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

	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 					

	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 whole number 	<ul style="list-style-type: none"> •Classify, compare and order angles •Measure and draw angles with a protractor 	<ul style="list-style-type: none"> •Add, subtract fractions with denominators that are multiples of the same number •Multiply fractions (and mixed numbers) by a 	<ul style="list-style-type: none"> •Coordinates in all four quadrants •Translation and reflection 						

<p>Summer Term</p>	<ul style="list-style-type: none"> •Represent, identify, name, write, order and compare fractions (including improper and mixed numbers) •Calculate fractions of amounts 	<ul style="list-style-type: none"> •Understand and use angle facts to calculate missing angles 	<p>whole number</p> <ul style="list-style-type: none"> •Explore percentage, decimal, fractions equivalence 	<ul style="list-style-type: none"> •Calculate intervals across zero as a context for negative numbers
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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
<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

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)
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<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 •Recognise and construct 3-D shapes •Name and illustrate parts of a circle 	<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 the volume of cuboids 	<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 and interpret lines graphs and pie charts •Compare pie charts 	<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 •Express missing number problems algebraically •Solve equations with unknown values 	<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

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 (Commutativity) • 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 product • List multiples and find the LCM • Multiply and divide integers and decimals by integers – use quotient and remainder • 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) <p>(Associativity)</p>

Secondary

Secondary Curriculum		
Year 7		
C1	C2	C3
<p>Unit 1 Prime Factorisation</p> <ul style="list-style-type: none"> Find the factors, HCF, multiples and LCM of numbers Find the prime factors of a number Determine HCF and LCM by prime factorisation Find squares, square roots, cubes and cube roots using prime factorisation <p>Unit 2 Positive and Negative Numbers</p> <ul style="list-style-type: none"> Represent positive and negative integers on a vertical number line Order positive and negative integers on a vertical number line (using the symbols $>$, \geq, $<$, and \leq) Add and subtract negative numbers Multiply and divide negative integers Use order of operations with negative numbers Solve real-life negative number problems 	<p>Unit 6 Percentages</p> <ul style="list-style-type: none"> Understand percentage as a fractional operator with denominator of 100 Convert between fractions, decimals and percentages Express a part of a whole as a percentage Find the percentages of given quantities (percentage of an amount) Find the whole given a part (as a percentage of the whole) Increase and decrease an amount by a percentage <p>Unit 7 Introduction to Ratio</p> <ul style="list-style-type: none"> Interpret $a : b$ and $a : b : c$, where a, b and c are whole numbers Understand the relationship between ratios and fractions Simplify ratios and use equivalence 	<p>Unit 9 Equations</p> <ul style="list-style-type: none"> Keep an equation balanced Solve one-step linear equations Solve two-step linear equations involving multiplication Solve two-step linear equations involving division Solve two-step linear equations involving squares, cubes and roots <p>Unit 10 Working with Units</p> <ul style="list-style-type: none"> Record and estimate measurements using decimal notation Convert between metric unit lengths Convert between metric volume units Convert between metric mass units <p>Unit 11 Perimeter and Area</p> <ul style="list-style-type: none"> Find the perimeter of quadrilaterals, triangles, rectilinear and compound shapes Form and solve equations using perimeter in simple and compound shapes

<p>Unit 3 Understand and Use Fractions</p> <ul style="list-style-type: none"> • Understand and compare fractions • Convert fractions to decimals • Convert terminating decimals to fractions in their simplest form • Convert between mixed numbers and improper fractions <ul style="list-style-type: none"> • Express one quantity as a fraction of another <p>Unit 4 Operations with Fractions</p> <ul style="list-style-type: none"> • Add and subtract fractions with like and unlike denominators • Add and subtract fractions with a combination of proper fractions, improper fractions, mixed numbers and whole numbers • Multiply fractions • Divide fractions • Solve problems with fractions <p>Unit 5 Fractions of amounts</p> <ul style="list-style-type: none"> • Find a fraction of a set of objects or quantity • Find the whole given a fraction of an amount • Solve word problems involving fractions of an amount 	<ul style="list-style-type: none"> • Divide a quantity into a given ratio • Share in a ratio when given one amount • Share in a ratio when given the difference • Solve word problems involving ratio <p>Unit 8 Algebraic Expressions</p> <ul style="list-style-type: none"> • Represent an unknown number using a letter • Represent the four operations algebraically • Form algebraic expressions from word problems • Identify algebraic 'like terms' • Simplify expressions by collecting like terms • Multiply algebraic terms • Expand and simplify expressions with brackets • Divide algebraic terms • Evaluate algebraic expressions 	<ul style="list-style-type: none"> • Find the area of quadrilaterals, triangles, rectilinear and compound shapes • Form and solve equations using area rules in simple and compound shapes
Year 8		
C1	C2	C3

<p>Unit 5 Fractions of amounts</p> <ul style="list-style-type: none"> Find a fraction of a set of objects or quantity Find the whole given a fraction of an amount Solve word problems involving fractions of an amount <p>Unit 6 Percentages</p> <ul style="list-style-type: none"> Understand percentage as a fractional operator with denominator of 100 Convert between fractions, decimals and percentages Express a part of a whole as a percentage Find the percentages of given quantities (percentage of an amount) Find the whole given a part (as a percentage of the whole) Increase and decrease an amount by a percentage <p>Unit 7 Introduction to Ratio</p> <ul style="list-style-type: none"> Interpret $a : b$ and $a : b : c$, where a, b and c are whole numbers Understand the relationship between ratios and fractions Simplify ratios and use equivalence Divide a quantity into a given ratio Share in a ratio when given one amount Share in a ratio when given the difference Solve word problems involving ratio <p>Unit 1 Direct and Inverse Proportion</p> <ul style="list-style-type: none"> Use ratio tables to find scale factors Complete simple proportion problems with scale factors Use proportion in recipe and best buy problems, and currency conversions Understand inverse proportion problems 	<p>Unit 3 Forming and Solving Equations</p> <ul style="list-style-type: none"> Solve equations with brackets Solve equations where the unknown is negative Solve linear equations in one unknown, where the unknown appears on both sides of the equation Solve equations with brackets and unknowns on both sides Solve fractional equations where the unknown is in the numerator or denominator Form and solve equations from area, perimeter, age-related and angle contexts Solve perimeter problems with rectilinear shapes involving expressions <p>Unit 5 Compound Measures</p> <ul style="list-style-type: none"> Write in different units such as km/h, m/min, cm/sec Calculate rates of change such as SDT Read and interpret distance-time graphs Read and interpret graphs that represent real-life contexts <p>Unit 7 Length and Area: Parallelogram and Trapezium</p> <ul style="list-style-type: none"> Convert between cm^2 and m^2 Find the areas of parallelograms and trapezia 	<p>Unit 11 Surface Area and Volume</p> <ul style="list-style-type: none"> Find the volumes of prisms: cubes, cuboids, triangular prisms and cylinders Find the surface area of prisms: cubes, cuboids, triangular prisms and cylinders When given surface area or volume, work backwards to find unknown dimensions Convert between cm^3 and m^3 <p>Unit 12 Linear Sequences</p> <ul style="list-style-type: none"> Recognise and describe an arithmetic sequence Generate terms of a sequence given and rule Find the formula for the nth term of an arithmetic sequence Explain whether a number is a member of a given sequence <p>Unit 13 Coordinates</p> <ul style="list-style-type: none"> Plot Coordinates in all four quadrants Find the midpoint of a line joining two points Find the endpoint of a line given the midpoint and another end point Solve problems with 2D shapes on coordinate grids <p>Unit 14 Transformations</p> <ul style="list-style-type: none"> Translate a shape by a given column vector Reflect a shape in a line, including on a coordinate plane Rotate a shape about a centre, including on a coordinate plane
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<ul style="list-style-type: none"> • Represent proportional relationships algebraically, in a table, or on graphs <p>Unit 2 Percentage Change</p> <ul style="list-style-type: none"> • Percentage change formula, calculating profit and loss • Multiplier method for increasing and decreasing percentages • Find the original amount (reverse percentages) • Reverse percentages using ratio tables 	<ul style="list-style-type: none"> • Find the area and perimeters of composite plane figures/compound shapes • Solve word problems involving area and perimeter <p>Unit 8 Rounding</p> <ul style="list-style-type: none"> • Round off a number to a required number of significant figures • Estimate the answer to a given problem • Identify rounding and truncation errors <p>Unit 9 Circles</p> <ul style="list-style-type: none"> • Recognise and find the circumference of a circle • Recognise and find the area of a circle • Find the area and perimeter of semi-circles and quarter-circles • Find the area and perimeter of compound shapes • Solve word problems involving area and perimeter <p>Unit 10 3D Shapes and Nets</p> <ul style="list-style-type: none"> • Recognise nets of 3D shapes • Build and name 3D shapes • Draw plans and elevations of a given solid • Identify a solid from its plans and elevations 	<ul style="list-style-type: none"> • Enlarge a shape from a given centre of enlargement (positive integer s.f.) • Identify and describe the transformation carried out by comparing an object and image • Complete combined transformations and identify invariant points <p>Unit 15 Univariate Data</p> <ul style="list-style-type: none"> • Find the mean (a measure of central tendency) from a raw data set • Find the median (a measure of central tendency) from a raw data set • Find the mode (a measure of central tendency) from a raw data set • Find the range (a measure of spread) of a raw data set • Comparing the central tendency and spread of two data sets using MMR • Create data sets when given the mean/median/mode/range • Find MMR from a stem & leaf diagram • Examine outliers • Construct and interpret bar graph, pictogram, pie chart, scatter graph <p>Unit 16 Basic Probability</p> <ul style="list-style-type: none"> • Understand and use the probability scale from 0 to 1 • Create a sample space diagram from a given trial • Calculate probabilities from a sample space diagram
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Year 9		
C1	C2	C3
<p>Unit 5 Compound Measures</p> <ul style="list-style-type: none"> • Write in different units such as km/h, m/min, cm/sec • Calculate rates of change such as SDT • Read and interpret distance-time graphs • Read and interpret graphs that represent real-life contexts <p>Unit 1 Indices and Standard Form</p> <ul style="list-style-type: none"> • Find higher powers through calculation • Derive, understand and use the multiplication and division rules of indices with integer values • Use standard form to express very large and small numbers, and convert between standard form and ordinary numbers • Correct numbers that are nearly in standard form • Perform calculations involving standard form, with and without a calculator 	<p>Unit 7 Linear and non-linear sequences</p> <ul style="list-style-type: none"> • Find the rule for the n^{th} term for a linear sequence • Recognise simple non-linear sequences (square, cube and triangular numbers, Fibonacci sequence) • Generate sequences from a given context • Solve problems involving a variety of sequences (not quadratic/geometric) <p>Unit 8 Linear graphs</p> <ul style="list-style-type: none"> • Identify the equations of horizontal and vertical lines • Identify the key features of a linear graph • Plot coordinates from a rule to generate a straight-line graph • Find the gradient of a straight line • Find the y-intercept of a straight line 	<p>Unit 12 Geometrical Reasoning</p> <ul style="list-style-type: none"> • Know and apply the formula for the interior angle sum of any polygon • Know and apply the formula for exterior angles of a polygon • Solve problems involving isosceles triangles and multiple polygons • Derive the proof of the sum of the angles in a triangle (Y11) • Find the number of sides of a polygon when given the exterior angle • Solve exterior angle problems with ratio and forming and solving equations • Find the number of sides when given the interior angle <p>Unit 13 Similarity</p> <ul style="list-style-type: none"> • Understand the relationship of angles and sides in similar shapes • Find missing lengths of similar shapes

<ul style="list-style-type: none"> • Use standard form to solve simple problems <p>Unit 2 Further Indices</p> <ul style="list-style-type: none"> • Derive, understand and use the Bracket Index Law with integer values • Calculate with the Fractional Index Law • Calculate with the Negative Index Law • Calculate with the Zero Index Law • Solve problems with index laws <p>Unit 3 Geometric Change</p> <ul style="list-style-type: none"> • Use a decimal multiplier to find percentage of amount and percentage increase/decrease • Solve reverse percentage problems by using decimal multipliers • Know the difference between simple and compound interest • Solve problems involving simple and compound interest • Solve other problems involving repeated change, such as depreciation <p>Unit 4 Algebraic Manipulation</p> <ul style="list-style-type: none"> • Rearrange terms in fractions from fraction-form to variables with fractional coefficients • Rearrange expressions in fractions from fraction-form to two separate terms • Solve equations that require applying an operation to an expression 	<ul style="list-style-type: none"> • Sketch linear graphs • Find the equation of straight-lines from visual graph • Find the equation of straight-lines using $y = mx + c$ • Identify and prove parallel lines from algebraic equations • Solve problems with parallel lines • Identify and prove perpendicular lines from algebraic equations • Solve problems with perpendicular lines <p>Unit 9 Intro to Quadratics</p> <ul style="list-style-type: none"> • Draw and recognise quadratic graphs • Expand the product of two binomials • Factorise quadratic expressions of the form $ax^2 + bx + c$ • Solve quadratic equations of the form $ax^2 + bx + c = 0$ by factorising • Recognise and expand/factorise the difference of two squares • Use quadratic graphs to find the approximate solution to quadratic equations <p>Unit 10: Pythagoras Theorem</p> <ul style="list-style-type: none"> • Derive Pythagoras' theorem • Use Pythagoras' theorem to find missing sides in right-angled triangles 	<ul style="list-style-type: none"> • Solve problems with similar shapes <p>Unit 14: Trigonometry</p> <ul style="list-style-type: none"> • Understand the trigonometric ratios sin, cos and tan • Use the trigonometric ratios to find missing lengths and solve multi-step/contextual problems • Use the trigonometric ratios to find missing angles and solve multi-step/contextual problems • Derive and use the exact values of sin θ, cos θ and tan θ for $\theta = 0^\circ, 30^\circ, 45^\circ, 60^\circ$ and 90° • Solve problems involving right-angled triangles using Pythagoras' Theorem, bearings and trigonometry • Understand the link between similar triangles and trigonometry <p>Unit 15: Probability</p> <ul style="list-style-type: none"> • Systematically list outcomes using a variety of representations (list, two-way tables, tree diagrams) • Use the product rule for counting • Calculate probabilities from probability trees; independent and dependent • Understand the multiplication rule for independent and dependent events • Populate Venn diagrams with raw data (using set notation and sub-sets) • Use Union, Intersection and Complement to list elements
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<ul style="list-style-type: none"> Solve more complicated equations with irrational values <p>Unit 5 Formulae</p> <ul style="list-style-type: none"> Rearrange a formula to make a variable the subject of that formula Change the subject of the formula by using factorisation Apply “changing the subject” to equations of straight lines <p>Unit 6 Linear Inequalities</p> <ul style="list-style-type: none"> Solve linear inequalities involving the multiplication or division of a negative number 	<ul style="list-style-type: none"> Solve associated problems in other shapes where right-angled triangles exist Deduce whether a triangle is right-angled by considering its sides <p>Unit 11 Angles in Parallel lines</p> <ul style="list-style-type: none"> Identify the different types of angles formed by parallel lines and a transversal such as corresponding angles, alternate angles and co-interior angles find unknown angles in parallel lines involving geometrical figures Extend transversals/parallel lines to find missing angles in parallel lines Draw a third parallel line to find missing angles 	<ul style="list-style-type: none"> Calculate probabilities and solve problems from Venn diagrams Understand when events are mutually exclusive and represent this on a Venn diagram <p>Unit 16 Working with data</p> <ul style="list-style-type: none"> Use measures of central tendency and spread to describe, interpret and compare datasets Apply advantages and disadvantages of different statistical measures Understand the difference between discrete and continuous data Convert raw data into ungrouped and grouped frequency tables (and vice versa) Find the mean from an ungrouped frequency table Find an estimate of the mean from a grouped frequency table, understanding why it is not exact Find the other averages from ungrouped and grouped frequency tables Construct and interpret scatter graphs, identifying outliers
Year 10 - Foundation		
C1	C2	C3
<p>Indices and standard form</p> <ul style="list-style-type: none"> Index rules 	<p>Linear equations and Inequalities</p>	<p>Compound measures</p> <ul style="list-style-type: none"> Use speed,density and pressure formula

- Converting numbers into and out of standard form
- Performing calculations with standard form
- Includes calculating with negative numbers, fractions and decimals

Fractions

- Perform the 4 operations with fractions
- Convert between improper fractions and mixed numbers
- Find fractions of a quantity in a given context

Fractions ,decimals, percentages

- Find percentages of amounts
- Convert between fractions, decimals, and percentages
- Calculate percentage change
- Solve problems with reverse percentages

Ratio and Proportion

- Compare and simplify ratios
- Share quantities in a given ratio
- Solve proportion problems ushc as recipes
- Solve problem involving direct and inverse proportion
- Use conversion graphs

- Simplify algebraic expressions by collecting like terms and expanding brackets
- Write formula from context
- Substitute numbers into a formula
- Solve multi step linear equations
- Represent inequalities on a number line
- Form and solve inequalities from context

Sequences

- Recognise and describe arithmetic and geometric sequences
- Generate terms of a sequence
- Find the nth term of a linear and geometric sequence

Linear graphs

- Plot points in all 4 quadrants
- Identify the equation of horizontal and vertical lines
- Plot linear graphs
- Find the equation of a linear graph
- Solve problems with parallel and perpendicular lines

Similarity and Transformations

- Perform Enlargements, translations, reflections and rotations

- Use density, mass and pressure formula
- Use various compound measures

Real life graphs

- Construct and use conversion ralphs
- Understand gradient and straight line in context

Quadratics

- Plot and solve with Quadratic graphs
- Factorise and expand quadratic expression
- Solve quadratic equations

Geometric change

- Simple and compound interest
- Problems with growth and decay

Year 10 - Higher		
C1	C2	C3
<p>Core knowledge:</p> <ul style="list-style-type: none"> • Surds: expand binomials and rationalise terms • Simple and compound interest problems; finding the rate, number of years and original amount • Non-linear sequences; pictorial and with surds • Similarity and Enlargement • Parallel and perpendicular lines • Simultaneous equations; lines and quadratic • Represent inequalities on a graph; find regions • Further quadratics: quadratic formula, completing the square, solving on a graph 	<p>Core knowledge:</p> <ul style="list-style-type: none"> • Multi-step and exact value trigonometry problems • 3D Pythagoras and trigonometry • Non-right-angled trigonometry • Circles, including arcs and sectors • Surface area and volume of complex 3D shapes: pyramid, cone, sphere, frustum • Plans and elevations • Upper and lower bounds <p>Mid-year Assessment (Feb): → x1 GCSE Style Non-Calculator Paper</p>	<p>Core knowledge:</p> <ul style="list-style-type: none"> • Theoretical and Experimental Probability • Product rule for counting • Tree Diagrams for independent and dependent events • Conditional Probability, including Venn Diagrams • Algebraic Reasoning and Proof • Manipulating and solving with algebraic fractions <p>End of Year Assessment: → x1 GCSE Style Calculator Paper → x1 GCSE Style Non-Calculator Paper</p>
Year 10 - Further		
C1	C2	C3
Core knowledge:	Core knowledge:	Core knowledge:

<ul style="list-style-type: none"> • Matrices - multiplying matrices, describing and combining transformations • Algebra 1 - simplifying expressions, solving linear equations, expanding brackets, binomial expansion, manipulating surds, product rule for counting 	<ul style="list-style-type: none"> • Sequences - Linear Sequences, Quadratic Sequences, Limiting Values of Fractional Sequences • Algebra 2 - factoring quadratics, simplifying algebraic fractions, completing the square 	<ul style="list-style-type: none"> • Coordinate Geometry - parallel and perpendicular lines, distances between point, splitting lines in a ratio, equation of a line • Algebra 3 - domain and range, composite functions, inverse functions, exponential functions, drawing functions • Algebra 4 - quadratic equations, the factor theorem, linear and quadratic inequalities
Year 11 - Foundation		
C1	C2	C3
<p>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>Assessment:</p>	<p>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 	<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: → Formal GCSE Examinations</p>

<p>→ Mini mocks - x1 GCSE Foundation Calculator style paper</p>	<p>estimates, identify correlation and outliers</p> <p>Assessment:</p> <p>→ Mock Examinations; x3 GCSE Foundation style papers (x1 Non-Calculator, x2 Calculator)</p>	
<p>Year 11 - Higher</p>		
<p>C1</p>	<p>C2</p>	<p>C3</p>
<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 ● Congruence - recognise congruent triangle and prove congruence using SSS, ASA, AAS and RHS <p>Proportional Reasoning:</p>	<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> <ul style="list-style-type: none"> ● Functions - use of function notation, finding inverses, composite functions ● Recurrence Relations - use iterative processes and recurrence formulae 	<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> <p>→ Formal GCSE Examinations</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: → Mini Mock Examinations; x1 GCSE Higher Calculator Paper</p>	<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: → Mock Examinations; x3 GCSE Higher style papers (x1 Non-Calculator, x2 Calculator)</p>	
Year 11 - Further		
C1	C2	C3
<p>Core knowledge:</p> <ul style="list-style-type: none"> • Calculus - differentiation, tangents and normals, stationary points • Algebra 4 - simultaneous equations, indices, algebraic proof, sequences 	<p>Core knowledge:</p> <ul style="list-style-type: none"> • Geometry 1- Pythagoras' theorem, angle facts, trigonometric functions, graphs and identities 	<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
Year 12 - A-level Mathematics		

C1	C2	C3
<p>Pure Maths Core knowledge:</p> <ul style="list-style-type: none"> ● Exponentials functions and modelling ● Laws of and solving logarithms ● Natural logarithms ● Algebraic Expressions, Equations and Inequalities ● Quadratics and the discriminant ● Algebraic Methods and proofs ● Binomial Expansion ● Straight-Line Graphs and linear/quadratic models <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, Cumulative Frequency, Reading and Interpreting Diagrams ● Basic principles of mechanics - modelling assumptions, components. ● Constant acceleration formulae - SUVAT - involving gravity. 	<p>Pure Maths Core knowledge:</p> <ul style="list-style-type: none"> ● Circle problems ● Vectors with geometric problems and modelling ● Graphs and Transformations ● Introduction to differentiation: using the gradient function and modelling ● Integration: indefinite, definite and area under curves <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, Probability Diagrams, Two Way Tables, Venn Diagrams ● 2D Vectors - component forms, angles above/below axes ● Variable Acceleration - Differentiating, Integrating, solving problems involving graphs. <p>Assessment Point 2:</p>	<p>Pure Maths Core knowledge:</p> <ul style="list-style-type: none"> ● Trigonometric ratios and transforming trigonometric graphs ● Trigonometric identities and equations ● Proofs and Partial Fractions ● Functions and mappings ● Graphing inverse and composite functions ● The modulus function ● Combining transformations <p>Applied Maths Core knowledge:</p> <ul style="list-style-type: none"> ● Modelling problems, graphical problems ● Moments - uniform bodies, tilting problems, variable centre of mass. ● Probability Distributions - Tabular Distributions, Probability Mass Functions ● Correlation and Linear Regression - Product Moment Correlation Coefficient, Equation of Regression Line, Interpreting Coefficients <p>Assessment Point 3:</p> <p>→ End of Year Assessment - Full set of A/S Past/Mock Papers for Pure and Applied.</p>

<ul style="list-style-type: none"> ● Newton's Second Law of Motion - Pulleys, Connected Particles, Reaction Forces <p>Assessment Point 1:</p> <ul style="list-style-type: none"> → Pure Maths Baseline assessment for course suitability in late September → 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. 	<ul style="list-style-type: none"> → Adjusted A/S Past/Mock Pure Mathematics Paper including questions only on topics covered. → One Adjusted A/S Past/Mock Paper on covered Statistics and Mechanics Content 	
Year 12 - A-level Further Mathematics		
C1	C2	C3
<p>Core knowledge:</p> <ul style="list-style-type: none"> ● Imaginary and complex numbers ● Multiplying complex numbers ● Complex conjugates ● Solving quadratic, cubic and quartic equations ● Modulus-argument form ● Argand Diagrams and Loci ● Matrix multiplication ● Determinants ● Inverses of 2x2 and 3x3 matrices ● Solving systems of simultaneous equations 	<p>Core knowledge:</p> <ul style="list-style-type: none"> ● Sums of natural, square and cube numbers ● Roots of Polynomials ● Proof by Induction ● Equation of a line and plane in 3-dimensions in vector form ● Scalar Product ● Calculating angles and perpendiculars between lines and planes ● Volumes of Revolution, including modelling ● Critical Path Analysis 	<p>In the final cycle before AS Examinations 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>Post examinations, students will begin to study the following Year 13 content:</p> <ul style="list-style-type: none"> ● De Moivre's Theorem ● Roots of Unity ● The Planarity Algorithm ● Floyd's Algorithm

<ul style="list-style-type: none"> • Linear transformations in 2- and 3-Dimensions • Algorithms, including Bubble and Quick sort • Graphs and Networks, including Graph theory • Route Inspection • Linear Programming <p>Assessment Point 1: → Baseline assessment for course suitability in late September</p>	<ul style="list-style-type: none"> • Discrete Random Variables • Binomial distribution • Poisson Distribution • Hypothesis Testing • Contingency Tables <p>Assessment Point 2: → Adjusted AS Past/Mock Paper including questions only on topics covered.</p>	<p>Assessment Point 3: → Formal AS Examinations</p>
Year 13 - A-Level Mathematics		
C1	C2	C3
<p>Pure Maths Core knowledge:</p> <ul style="list-style-type: none"> • Radian measure • Inverse and reciprocal trigonometric functions • Addition & double angle formulae • Differentiating all functions • Product, chain and quotient rule • Differential equations • Integrating all functions • Integrating by substitution and parts • Trapezium rule <p>Applied Maths Core knowledge:</p> <ul style="list-style-type: none"> • Friction - horizontal plane, inclined planes, involving components 	<p>Pure Maths Core knowledge:</p> <ul style="list-style-type: none"> • Parametric equations • Arithmetic & geometric sequences • Further binomial expansion • Binomial expansion with partial fractions • Numerical methods • Vectors <p>Applied Maths Core knowledge:</p> <ul style="list-style-type: none"> • Normal Distribution - Finding Probabilities, Inverse Normal Distribution, Finding Unknown Parameters. 	<p>Core knowledge:</p> <ul style="list-style-type: none"> • Revision for A-Level examinations <p>Assessment: Formal Examinations for End of Course</p>

<ul style="list-style-type: none"> • Projectiles - horizontal projection, projection at any angle, general projectile formulae. • Application of Forces - static particles, rigid bodies, dynamics & inclined planes. • Further kinematics - differentiating vectors, vectors in 3D, integrating vectors <p>Assessment Point 5: → Full set of A/S Past/Mock Papers</p>	<ul style="list-style-type: none"> • 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 Testing for the Mean of a Normal Distribution. <p>Assessment Point 6: → Full set of A Level Past/Mock Papers</p>	
Year 13 - A-level Further Mathematics		
C1	C2	C3
<p>Core knowledge:</p> <ul style="list-style-type: none"> • Maclaurin Series • Hyperbolic functions, including inverse functions, graphs and identities • Improper Integrals • Mean value of a function • Differentiating and Integrating Inverse Trigonometric Functions, Hyperbolic Functions and Partial Fractions • The Simplex Algorithm • Critical Path Analysis • Nearest Neighbour Algorithm <p>Assessment Point 4: Full AS Style Examination → Paper 1: Core Pure</p>	<p>Core knowledge:</p> <ul style="list-style-type: none"> • First Order Differential Equations • Second Order Homogeneous and Non-homogeneous Differential Equations • Modelling with first order differential equations • Simple Harmonic Motion • Damped and Forced Harmonic Motion • Coupled first-order simultaneous differential equations • Volumes of Revolutions, including parametric curves • Polar coordinates 	<p>In the final cycle before A Level Examinations 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: → Formal A Level Examinations</p>

<p>→ Paper 2: Decision 1 and Further Statistics 1</p>	<ul style="list-style-type: none">• Geometric and negative binomial distributions• Hypothesis testing• The central limit theorem <p>Assessment Point 5: Full A Level Style Examination</p> <ul style="list-style-type: none">→ Paper 1: Core Pure→ Paper 2: Core Pure→ Paper 3: Further Statistics 1→ Paper 4: Decision 1	
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