

Maths Curriculum Overview, 2021-2022

<p>Why do we teach Maths at Ark BDA?</p>	<p>There are three key elements of maths that we teach here at Ark BDA.</p> <p>We teach the necessary maths to help grow students that are confident with real-life numeracy, practical maths related knowledge and work- related knowledge. We also want to give students the subject knowledge to access higher qualifications in mathematics, science, economics and various other courses. Fluency in fundamental Maths is essential to their learning journey. It will enable them to apply knowledge rapidly and accurately.</p> <p>We teach the personal and social aspects of maths that enables students to model problems in a mathematical framework and problem solve. Mathematics makes our lives orderly and prevents chaos. Certain qualities are nurtured by maths such as analysing, evaluating, generalising, creativity, abstract or spatial thinking, effective communication, reasoning and justifying with mathematical language that students need to be successful later in life. To access problem solving skills conceptual understanding is essential to allow students to make links and connections. The deeper the mathematical understanding, the more perseverant students become.</p> <p>Finally, we teach an appreciation of maths, not just as a subject, but as an Element of Culture that has played a major part in history, culture and society in general.</p>
<p>How do we deliver our Christian values in Maths?</p>	<p>From Key Stage 1 right through to Key stage 3, students are exposed to opportunities where they develop their mathematical thinking. In these lessons' students investigate topics, collate their findings and present their ideas to their peers. This student led approach to learning develops our pupils as leaders and builds a sense of commitment in them.</p> <p>Every lesson builds time for students to work independently on new and challenging concepts developing students' resilience.</p> <p>At the end of each lesson, secondary students have an opportunity to apply their learning to contextual problems. This can be very challenging for some pupils as there is no structured approach to problem solving, however the Maths department encourages pupils to have growth mindsets by celebrating their mistakes in lessons so that they can learn from them have the courage persevere with problems. In primary, growth mindset is taught across the curriculum, it is reinforced particularly in maths as we use mistakes as learning opportunities. When the class discovers a misconception, as a class we unpick how the error came about and revise the correct strategies with reasoning. In an average maths lesson this would be explored through questioning students, using mini whiteboards to show call and taking feedback. Teachers would then model the methods and revisit the learning points.</p> <p>The Maths department has a genuine love of maths that we try to foster in our students. We link each unit that we teach to one of the three elements of maths, to make connections between different mathematical concepts.</p> <p>The teachers in the maths department understand that all pupils have different strengths and weaknesses in maths. We plan every lesson with compassion by ensuring that tasks are differentiated to enable all pupils to access learning.</p> <p>We do not believe in having different lesson objectives for our pupils just because they may have a lower starting point. We have one highly pitched lesson objective for each lesson because we have high expectations for every pupil. We are ambitious and set a challenging curriculum to ensure high standards are met for every child.</p>

	<p>The entire maths team are involved in ensuring year 11 achieve excellent outcomes by running after school intervention, creating resources, running homework clubs or running booster sessions. Because of this, students have faith that the maths teachers will do whatever is necessary to ensure pupils achieve their god given potential.</p>
<p>How do we build core skills and knowledge over time?</p>	<p>The core skills that are taught from Early Years right through to key stage 5 are fluency, reasoning and problem solving.</p> <p>We use the Maths Mastery curriculum from Year R through to Year 8 which allows students to develop a deeper understanding and appreciation of the connections in mathematics using the concrete, pictorial, abstract model which gives them the deeper understanding to adapt their knowledge to different situations. These transferable skills give our students the capacity to solve problems not only within the mathematics curriculum, but in the wider-world.</p> <p>From Key stage 4 (year 9-11) we continue to develop students' reasoning and problem-solving skills. We begin by helping the students to memorise the knowledge. Once students have mastered key facts, the maths team guide students to apply their knowledge to challenging problems. We provide guidance on how to reason and how to approach and work through problems, which is repeatedly practiced at the end of each lesson.</p> <p>The more confident mathematicians in year 9 and 10 follow an accelerated scheme of learning to enable them to complete their GCSE course content by the end of year 10. From year 11 these pupils are taught Further Maths Level 2 which allows them to practice some A Level content and provides them with an advantageous foundation for Maths A Level.</p> <p>Students in key stage 4 that struggle to access the GCSE have additional lessons of Maths each week with a targeted scheme of learning purely concentrated around mastering high leverage GCSE topics. These students are also entered for entry level maths exams to ensure all students can achieve.</p> <p>Mathematics is a pyramid, where students must secure a strong understanding of the basics before moving on. To this end, we ensure that students have real fluency with their topics before moving on with the curriculum through immediate verbal feedback in class, in class assessments regular homework, quizzes on specific topics and regular whole year summative assessments. For each of these assessment checks, our teachers review weak areas and provide support to those who are struggling. From Key Stage 1 and Key Stage 2 we offer same day interventions to ensure learning is achieved and no child is left behind. In key stage 3 and key stage 4 we offer booster classes to ensure students are fluent with performing the four operations – which forms the foundations for all maths. We also signpost students to independently work on their areas for development independently using Hegarty Maths.</p>
<p>How does the study of Maths prepare students for life beyond Ark BDA?</p>	<p>Maths is a core subject that students need to be proficient in before they leave education. Maths is useful in everyday life and essential for our young people to develop problem solving skills, logical thinking, spatial awareness, understanding currency, managing and evaluating data in order to make decisions and manage their own incomes and household finances in adulthood. It is a pre-requisite for access onto all courses after key stage 4, be it an apprenticeship, a Technical Course or A-Levels. Students who go on to study maths and further maths at A level have a clear pathway into careers such engineering, finance, medicine, accountancy and trading as well as numerous other professions.</p> <p>Maths is necessary in all aspects of daily life. To be an independent, self-sufficient person, one would need maths for a massive range of situations, here are just some examples:</p>

	<p>The kitchen Baking and cooking: measuring ingredients, portioning recipes using ratio, multiplication and division to scale recipes.</p> <p>Gardening Calculating areas of land needed, seed/space ratio, working with volume regarding to amount of water needed.</p> <p>Art Whether you are a sculptor, a painter or a dancer. You will need to be able to measure, count, and apply basic maths for measurements.</p> <p>Planning/Organisation Planning outings requires a deep knowledge of time, map reading, calculating the cost of fuel required.</p> <p>Banking Managing finances requires a deep understanding of functional maths, knowledge of overdrafts, net profits, tax will to ensure financial success.</p> <p>Decorating your home Calculating amount of paint needed, measuring the floor for carpet or costing for new furniture.</p> <p>The careers accessible with a maths A level and maths degree are limitless but include:</p> <ul style="list-style-type: none"> • Accountant • Actuary • Aeronautical engineering • An academic mathematician • Defence and Intelligence roles • Operational researcher • Investment Banking • Investment management • Retail Banking • Statistician • Actuarial Analyst • Data analyst • Research Scientist • Engineering • Meteorology • Teaching
Implementation	As a response to Covid – ARK and Maths Mastery have been working together to create an abridged Primary curriculum which has been further broken-down week by week, so teachers have a clear structure to ensure any gaps in learning are addressed. In year 7, 8 and 9 there are 4 lessons of maths each week. In year 10 and 11 there are 5 lessons of maths each week. Where there is

spare capacity in the timetable, some year 11 students and some year 10 students have been lucky enough to receive an extra 2 periods of maths a week, dependant on their option blocks to support them further where it is required. Finally, in year 12 and 13 there are 6 face to face lessons of maths per week. When students have free periods, they are required to study independently in the 6th form library. This style of timetable mirrors university and is therefore developing the independent study skills needed for students to be successful at university.

For year 7 and 8, who follow Maths Mastery, only the fundamental mathematical topics are taught each year. This is structured in a thematic way for each unit. This allows for pupils to cover fewer topics but gain a deeper level of understanding. The time taken to deliver each of these topics is divided equally between them. This gives teachers more scope to delve deeper into each topic. At the start of each of these units, Year 7 and 8 think about the big picture and how each topic they will learn about are linked. At the start of each unit, the maths team share the core learning that will take place with the pupils. We take this approach because research suggests teaching maths in this way positively impacts pupil progress in secondary school by on average 1 month.

For year 9, 10 and 11 the time it takes to teach each topic varies. When determining the length of time that is allocated to each topic, two things are considered. The complexity of the topic, and the ability of the class. More complex topics such as transforming graphs, have more time allocated to teach them as they are harder for students to grasp. In addition, more time would be allocated to a less able class as opposed to a more able class. Time is then built in at the end of each half term, and again at the year to revisit topics taught. At the start of each key stage 4 topic, students explore how the topic ties into one of the '**3 reasons why we study maths here at BDA**', mentioned above. All the topics that are taught from Early Years right through to Key Stage 4 reflect the most current Maths National Curriculum. These are woven together in a scheme of work that is chronological meaning within each unit, each topic that is taught builds on from the previous topic. While it is possible to change the sequencing of each unit, this is ill advised; sometimes pupils will need knowledge from 2 or 3 separate units in order to access their unit. The sequencing of the scheme of work allows pupils to revisit topics and build on key prior knowledge so that in practice students are moving back and forth throughout the key skills to both build on new learning and revisit prior learning to secure the domain of knowledge. Deep thought has been put into the sequence of units which have been interleaved to ensure that pupils can not only access the learning but that they can make connections across topics. At the start of each year, our secondary students are given checklists which detail all the topics that they will cover that year. Lesson by lesson teachers share the core learning for that lesson along with any academic vocabulary, and at the end of each lesson students are encouraged to revisit the core knowledge checklist and self-assess their confidence levels. This list is sent home to parents at the start of the year, along with a guide detailing how their student should be studying independently at home. Pupils are also given comprehension booklets that have a model example and the guided practice questions covered in each lesson. These booklets are used alongside lesson power points so that students do not miss out on curriculum delivery in the event of a full lockdown. Knowledge organisers are distributed to students each half term with key facts that students are required to memorise. This alongside comprehension booklets ensure that students can recall the key skills for each unit and can apply them. Students are expected to complete a minimum of 1.5hrs homework on an online platform called Hegarty Maths. In addition to this, students at Key Stage 4 are given independent study booklets, a compilation of low stakes quizzes, and revision guides to encourage them to revisit prior knowledge throughout the year.

The maths team work closely with the primary school teachers and each other to ensure that year on year pupils build on knowledge. We have planned the mathematics curriculum backwards from University (which is the end goal) right through to early years.

	<p>There are 3 strands in maths that underpin the entire curriculum from Early Years to Key Stage 5. Fluency - are pupils confident in performing the mathematical skills over and over; Reasoning – can pupils explain and justify what they have done; and Problem solving – can pupils do both in context.</p>
<p>Impact</p>	<p>Pupils from Early Years to Key stage 5 are assessed in a variety of ways. In Early Years, assessment consists of teacher assessment against the early learning goals. Once in Key Stage 1, assessment builds up to daily formative assessment where teachers give live feedback and then there are more formal summative assessments in the form of the PUMA and PIRA papers. This continues in Key Stage 2. Notable national assessments are the Year 2 SATs, the Multiplication Table Check at the end of Year 4 and the Year 6 SATs. Further to these assessments, Maths Mastery and ARK will introduce diagnostic quizzes to efficiently find gaps in knowledge prior to new topics, so teachers can respond accordingly to their children’s needs. Secondary pupils’ self or peer mark their work at the end of every lesson. Within the class we assess formatively to give students immediate feedback, as with primary, so that pupils can improve, something we call fast feedback. Based on research this is the most effective form of immediate feedback that allows students to make the most progress but has the least impact on teacher workload. In addition to this, we use summative assessments at the end of every term. This is to ensure that students are building on their knowledge each term. Finally, we do one final assessment at the end of the year. For year 7 this includes the topics they have learned that year. For year 8 it includes the topics learned in year 7 and 8, and so on.</p> <p>That said, the curriculum at BDA is driven by our curriculum intent as opposed to assessment models. We will know if students at BDA have met our curriculum intention if:</p> <ul style="list-style-type: none"> • they are confident and fluent with numeracy • they can apply their mathematical skills in other subjects • they choose to access STEM based courses in higher education • they have acquired the key transferable skills such as analysing, evaluating, generalising, reasoning and justifying • they can make links and connections • they are resilient when faced with a problem • they appreciate maths as not just a subject but as a part of culture

Implementation:

		Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
Year R	Topic	Number	Number	Number	Number	Shape, number, measures	Measures, number
	Content	-Early mathematical experiences -Pattern and early number -Numbers within 6	-Addition and subtraction within 6 -Measures Shape and sorting -Calendar and time	-Numbers within 10 -Addition and subtraction within 10 -Numbers within 15	-Grouping and sharing -Numbers within 20 -Doubling and halving	-Shape and pattern -Addition and subtraction within 20 - Money	- Measures -Depths of numbers within 20 -Numbers beyond 20
	Assessment	Teacher assessment	Teacher assessment	Teacher assessment	Teacher assessment	Teacher assessment	Teacher assessment
Year 1	Topic	Number, Shape	Number	Measures, Number	Number, Fractions, Measure	Number, Measures	Number, Measures
	Content	-Numbers to 10 -Addition and subtraction within 10 -Shape and pattern	-Numbers to 20 -Addition and subtraction	-Time -Exploring calculation strategies within 20 -Numbers to 50 -Addition and subtraction within 20	-Addition and subtraction within 20 -Fractions -Measures: length and mass	-Numbers beyond 50 to 100 and beyond -Addition and subtraction -Money	-Multiplication and division -Measures: capacity and volume
	Assessment	Formative pre and post unit quizzes	Formative pre and post unit quizzes	PUMA Formative pre and post unit quizzes	Formative pre and post unit quizzes	Formative pre and post unit quizzes	PUMA – Summer Year 1 Formative pre and post unit quizzes
Year 2	Topic	Number	Measures, Statistics, Number	Measure, Fractions, Number	Measure, Geometry	Number, Measures,	Number
	Content	-Numbers within 100 -Addition and subtraction of 2 digit numbers	-Measures: length -Multiplication and division:2,5,10	-Multiplication and division -Time -Fractions	-Addition and subtraction of 2 digit numbers -Money	-Numbers within 1000 Measures: capacity and volume -Measures: mass	-Exploring calculation strategies -Multiplication and division: 3 and 4

		-Addition and subtraction word problems			-Face, shapes, lines and turns		
	Assessment	Baseline PUMA - Summer Year 1 Cumulative arithmetic Formative pre and post unit quizzes	Cumulative arithmetic Formative pre and post unit quizzes	PUMA Cumulative arithmetic Formative pre and post unit quizzes	Cumulative arithmetic Formative pre and post unit quizzes	Cumulative arithmetic Formative pre and post unit quizzes Practise SATs	SATs
Year 3	Topic	Number, Statistics	Number, Measures	Number and Measures	Measures and Fractions	Geometry, Measures	Number
	Content	-Number sense and exploring calculation strategies -Place value -Graphs	-Addition and subtraction -Length and perimeter	-Multiplication and division -Deriving multiplication and division facts -Time	-Time -Fractions	-Angles and shape -Measures	-Securing multiplication and division -Exploring calculation strategies and place value
	Assessment	Baseline PUMA - Summer Year 2 Cumulative arithmetic Formative pre and post unit quizzes	Cumulative arithmetic Formative pre and post unit quizzes	PUMA Cumulative arithmetic Formative pre and post unit quizzes	Cumulative arithmetic Formative pre and post unit quizzes	Cumulative arithmetic Formative pre and post unit quizzes	Cumulative arithmetic PUMA – Summer Year 3 Formative pre and post unit quizzes
Year 4	Topic	Number	Number, Statistics	Number, Fraction, Measure	Number, Geometry	Measure, Geometry	Geometry, Number
	Content	-Reasoning with large numbers -Addition and subtraction -Multiplication and division	-Discrete and continuous data -Multiplication and division	-Fractions -Time	-Decimals -Area and perimeter	-Solving measures and money problems -Shape and symmetry	-Position and direction -Reasoning with pattern and sequence -3D shape
	Assessment	Baseline PUMA - Summer Year 3 Cumulative arithmetic Formative pre and post unit quizzes	Cumulative arithmetic Formative pre and post unit quizzes	PUMA Cumulative arithmetic Formative pre and post unit quizzes	Cumulative arithmetic Formative pre and post unit quizzes	Cumulative arithmetic Formative pre and post unit quizzes	Multiplication tables check Cumulative arithmetic PUMA
Year 5	Topic	Number, Statistics	Number, Geometry	Fractions, Numbers, Geometry	Fractions, Geometry	Measures, Number, Geometry	Measures, Number
	Content	-Reasoning with large whole integers -Integer addition and subtraction -Line graphs and timetables	-Multiplication and division -Perimeter and area -Yr 4 2D shape (extra unit)	-Fractions and decimals -Angles	-Fractions and percentages -Transformations	-Converting units of measure -Calculating with whole numbers and decimals -2D and 3D shape	-2D and 3D shape -Volume -Problem-solving

	Assessment	Baseline PUMA - Summer Year 4 Cumulative arithmetic Formative pre and post unit quizzes	Cumulative arithmetic Formative pre and post unit quizzes	PUMA Cumulative arithmetic Formative pre and post unit quizzes	Cumulative arithmetic Formative pre and post unit quizzes	Cumulative arithmetic Mock SATs Formative pre and post unit quizzes	Cumulative arithmetic Mock SATs Formative pre and post unit quizzes
Year 6	Topic	Number	Number, Fraction, Geometry	Geometry, Fractions, measures	Number, Statistics, Fractions	Consolidation	Consolidation
	Content	-Integers and decimals -Multiplication and division	-Calculation problems -Fractions -Missing angles and length	-Coordinates and shapes -Fractions -Decimals and measure	-Decimals and measure -Percentages and statistics -Proportion problems		
	Assessment ARK Arithmetic test	Arithmetic PUMA – Y5 Summer	Mock SATs Arithmetic	Mock SATs Arithmetic	Mock SATs Arithmetic test	SATs	

		Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
Year 7 All Sets	Topic	Number Systems 1	Number Systems 2	2D Geometry	The Cartesian plane	Fractions	Ratio and Proportion
	Key question	Can I apply the four axioms to positive and negative integers?	Do I have the basics of number and algebra?	Can I classify and construct 2D shapes?	Can I work with 2D shapes to find their area and transform them?	Can I break down numbers into their smallest parts. Can I apply the four axioms to fractions?	How deeply do I understand the link between fractions, decimals, percentages and ratios?
	Content	Place Value; Axioms & arrays; Factors & multiples; Order of operations	Positive & negative numbers; Expressions, Equations and Inequalities	Angles; Classifying 2-D shapes; Constructing triangles & quadrilaterals	Coordinates; Area of 2-D shapes; Transforming 2-D figures	Prime factor decomposition; Equivalent fractions; All operations acting on fractions	Ratio; Percentages; Recap of year
	Assessment	Hegarty Maths Quizzes	Cumulative assessment Aut 2	Hegarty Maths Quizzes	Cumulative assessment Spr 2	Hegarty Maths Quizzes	Cumulative assessment Sum 2
Year 8 All Sets	Topic	Equations and inequalities	Graphical representations	Proportional reasoning	Representations and reasoning with data	Angles	Area, volume, and surface area
	Key question	Can I build on my foundation of algebra?	Can I work with straight line graphs and their equations?	Can I calculate percentage change,	Do I understand the use of statistic in the real world?	Can I use reasoning of angles and properties of shapes	Can I calculate area, volume and surface area?

				ratio and rates of change?		to develop understanding?	
	Content	Sequences; Forming and Solving Equations; Forming and solving inequalities	Linear Graphs; Accuracy and Estimations	Ratio; Real Life graphs; Rates of change; Direct and Inverse Proportion;	Univariate and bivariate data	Angles in Polygons; Bearings	Circles and composite shapes; Volume and surface area of prisms;
	Assessment	Hegarty Maths Quizzes	Cumulative assessment Aut 2	Hegarty Maths Quizzes	Cumulative assessment Spr 2	Hegarty Maths Quizzes	Cumulative assessment Sum 2
Year 9 (foundation) Set 4 - 7	Topic	Number; Algebra	Algebra; Fractions and Percentages	Fractions, Indices and Standard Form; Probability	Probability; Perimeter, Area and Volume 1	Perimeter, Area and Volume 2	
	Content	Calculations Rounding and Estimation Decimal numbers Place value Factors and multiples Squares, cubes and roots and Index notation Prime factors Algebraic expressions Simplifying expressions Substitution	Expanding brackets Factorising Using formulae Working with fractions, Operations with fractions Multiplying fractions Dividing fractions Fractions and decimals Fractions and percentages,	Multiplying and dividing fractions The laws of indices Writing numbers in standard form Calculating with standard form Calculating probability Two events Experimental probability	Venn diagrams, Tree diagrams, More tree diagrams Rectangles, parallelograms and triangles, Trapezia and changing units, Area of compound shapes, Surface area of 3D solids, Volume of prisms, More volume and surface area	Circumference of a circle 1, Circumference of a circle 2, Area of a circle, Semicircles and sectors, Composite 2D shapes and cylinders, Pyramids and cones, Spheres and composite solids	
	Assessment	Mini-tests on each topic	Cumulative assessment Aut 2	Mini-tests on each topic	Cumulative assessment Spr 2	Mini-tests on each topic	Cumulative assessment Sum 2

Year 9 Higher Set 1 - 3	Topic	Number	Algebra	Fractions, Ratio and Proportion	Equations and Inequalities	Angles and Trigonometry	More Trigonometry
	Content	Number problems and reasoning, Place value and estimating, HCF and LCM, Calculating with powers (indices), Zero, negative and fractional indices, Powers of 10 and standard form, Surds	Algebraic Indices, Expanding and Factorising, Equations, Formulae, Linear Sequences, Non-linear sequences, More expanding and factorising	Fractions, Ratios, Ratio and Proportion, Percentages, Fractions, Decimals and Percentages	Solving quadratic equations 1, Solving quadratic equations 2, Completing the square, Solving, More Simultaneous Equations, Solving linear and quadratic simultaneous equations, Solving linear inequalities	Angle properties of triangles and quadrilaterals, Interior angles of a polygon, Exterior angles of a polygon, Pythagoras' theorem 1, Pythagoras' theorem 2, Trigonometry 1, Trigonometry 2	Accuracy, Graph of the sine function, Graph of the cosine function, The tangent function, Calculating areas and the sine rule, The cosine rule and 2D trigonometric problems, Solving problems in 3D, Transforming trigonometric graphs 1, Transforming trigonometric graphs 2
	Assessment	Mini-tests on each topic	Cumulative assessment Aut 2	Mini-tests on each topic	Cumulative assessment Spr 2	Mini-tests on each topic	Cumulative assessment Sum 2
Year 10 Targeted intervention group	Topic	Using Number and the Number System	GCSE Number	Handling information and data	GCSE Handling Data	Using common measures, shape and space	GCSE Shape and Space
	Content	Count, read, write, order and compare numbers up to 1000	Calculations Decimal numbers Place value	Extract information from lists, tables, diagrams and charts and create frequency tables	Two-way tables Stem and leaf diagrams	Calculate with money using decimal notation and express money correctly in	Calculating perimeter and area of trapezia, parallelograms, rectangles, triangles

		<p>Add and subtract using three-digit whole numbers</p> <p>Divide three-digit whole numbers by single- and double-digit whole numbers and express remainders</p> <p>Multiply two-digit whole numbers by single- and double-digit whole numbers</p> <p>Approximate by rounding numbers less than 1000 to the nearest 10 or 100 and use this rounded answer to check results</p> <p>Recognise and continue linear sequences of numbers up to 100</p> <p>Read, write and understand thirds, quarters, fifths and tenths, including equivalent forms</p>	<p>Factors and multiples Squares, cubes and roots and</p> <p>Index notation</p> <p>Prime factors</p> <p>Working with fractions</p> <p>Four operations with fractions</p> <p>Fractions and decimals</p> <p>Fractions and percentages</p> <p>Calculating basic percentages – non calc</p>	<p>Interpret information, to make comparisons and record changes, from different formats, including bar charts and simple line graphs</p> <p>Organise and represent information in appropriate ways, including tables, diagrams, simple line graphs and bar charts</p>	<p>Mode, median and range</p> <p>Scatter graphs</p> <p>Extract information from bus and train timetables</p>	<p>writing in pounds and pence</p> <p>Round amounts of money to the nearest £1 or 10p</p> <p>Read, measure and record time using am and pm</p> <p>Read time from analogue and 24-hour digital clocks in hours and minutes</p> <p>Use and compare measures of length, capacity, weight and temperature using metric or imperial units to the nearest labelled or unlabelled division</p> <p>Compare metric measures of length, including millimetres, centimetres, metres and kilometres</p> <p>Compare measures of weight, including grams and kilograms</p> <p>Compare measures of capacity, including millilitres and litres Use a suitable instrument to measure mass and length</p>	<p>Angles in triangles and quadrilaterals</p> <p>Translations</p> <p>Add and subtract vectors. Find multiples of a vector.</p> <p>Reflections</p> <p>Rotations</p> <p>Enlargement</p>
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		Read, write and use decimals up to two decimal places Recognise and continue sequences that involve decimals				Sort 2-D and 3-D shapes using properties, including lines of symmetry, length, right angles, angles, including in rectangles and triangles Use appropriate positional vocabulary to describe position and direction, including eight compass points and full/half/quarter turns	
	Assessment						
Year 10 (Foundation) Set 4 - 7	Topic	Equations, Inequalities and Sequences; Graphs	Graphs and Quadratic Equations; Angles	Right-angle Triangles; Constructions, Loci and Bearings	Averages and Range; Graphs, Tables and Charts	Ratio and Proportion; Multiplicative Reasoning	Transformations
	Content	Solving equations 1	Real-life Graphs	Pythagoras' theorem 1,	Mean and range,	Writing Ratios	Translation,
		Solving equations 2	Distance-time graphs	Pythagoras' theorem 2,	Mode, median and range,	Using Ratios	Reflection,
		Solving equations with brackets	Expanding double brackets	Trigonometry: the sine ratio 1,	Types of average,	Ratio and Measures	Rotation,
		Introducing inequalities	Plotting quadratic graphs	Trigonometry: the sine ratio 2,	Estimating the mean,	Comparing with Ratios	Enlargement,
		Solving Linear Inequalities	Using quadratic graphs	Trigonometry: the cosine ratio,	Sampling	Using Proportion	Describing enlargements,
		Integer solutions to Inequalities	Factorising quadratic graphs	Trigonometry: the tangent ratio,	Frequency tables,	Proportion and Graphs	Combining transformations
		Substituting into Formulae	Solving quadratic equations graphically	Finding lengths and angles using trigonometry,	Two-way tables	Ratio and proportion problems	Similarity and enlargement,
	Subject of Formulae	Properties of shapes	3D solids,	Representing data,	Percentages,	More similarity	
				Time series,	Growth and decay,	Using similarity,	
				Stem and leaf diagrams,			

		<p>Generating Sequences</p> <p>Using Nth term of linear sequences</p> <p>Finding Nth term of linear sequences</p> <p>Coordinates</p> <p>Linear Graphs</p> <p>Gradient of Straight Line</p> <p>Equation of a straight line from graph ($y=mx+c$)</p>	<p>Angles in parallel lines</p> <p>Angles in triangles</p> <p>Exterior and interior angles</p> <p>Geometrical patterns</p>	<p>Plans and elevations,</p> <p>Accurate drawings 1,</p> <p>Scale drawings and maps,</p> <p>Accurate drawings 2,</p> <p>Constructions,</p> <p>Loci and regions,</p> <p>Bearings,</p>	<p>Pie charts,</p> <p>Scatter graphs,</p> <p>Line of best fit</p>	<p>Compound measures,</p> <p>Distance, speed and time,</p> <p>Direct and inverse proportion</p>	<p>Congruence 1,</p> <p>Congruence 2,</p> <p>Vectors 1,</p> <p>Vectors 2</p> <p>Graphs of cubic and reciprocal functions,</p> <p>Non-linear graphs,</p> <p>Solving simultaneous equations graphically,</p> <p>Solving simultaneous equations algebraically,</p> <p>Rearranging formulae,</p> <p>Proof.</p>
	Assessment	Mini-tests on each topic	Cumulative assessment Aut 2	Mini-tests on each topic	Cumulative assessment Spr 2	Mini-tests on each topic	Cumulative assessment Sum 2
Year 10 (Higher) Set 1 - 3	Topic	More Algebra; Graphs	Equations and Graphs; Area and Volume	Similarity and Congruence; Transformations and Constructions	Multiplicative Reasoning; Probability	Interpreting and Representing Data;	Further Statistics; Revision for Mock Exams
	Content	<p>Rearranging formulae</p> <p>Algebraic fractions</p> <p>Simplifying algebraic fractions</p> <p>More algebraic fractions</p>	<p>Solving simultaneous equations graphically</p> <p>Representing inequalities graphically</p> <p>Graphs of quadratic functions</p>	<p>Congruence</p> <p>Geometric proof and congruence</p> <p>Similarity</p> <p>More similarity</p> <p>Similarity in 3D solids</p>	<p>Growth and decay</p> <p>Compound measures</p> <p>More compound measures</p> <p>Ratio and proportion</p> <p>Combined events</p>	<p>Statistical diagrams 1</p> <p>Time Series</p> <p>Scatter Graphs</p> <p>Line of best fit</p> <p>Averages and Range</p> <p>Statistical Diagrams 2</p>	<p>Sampling</p> <p>Cumulative frequency</p> <p>Box plots</p> <p>Drawing histograms</p> <p>Interpreting histograms</p>

		<p>Surds</p> <p>Solving algebraic fraction equations</p> <p>Functions</p> <p>Algebraic Proof</p> <p>Linear graphs</p> <p>More linear graphs, Graphing rates of change</p> <p>Real-life graphs</p> <p>Line segments</p> <p>Quadratic graphs</p> <p>Cubic and reciprocal graphs</p> <p>More graphs</p>	<p>Solving quadratic equations graphically</p> <p>Graphs of cubic functions.</p> <p>Perimeter and area</p> <p>Units and accuracy</p> <p>Prisms</p> <p>Circles</p> <p>Sectors of circles</p> <p>Cylinders and spheres</p> <p>Pyramids and cones.</p>	<p>3D solids</p> <p>Reflection and rotation</p> <p>Enlargement</p> <p>Transformations and combinations of transformations</p> <p>Bearings and scale drawings</p> <p>Constructions 1</p> <p>Constructions 2</p> <p>Loci</p>	<p>Mutually exclusive events</p> <p>Experimental probability</p> <p>Independent events and tree diagrams</p> <p>Conditional probability</p> <p>Venn diagrams and set notation</p>		<p>Comparing and describing populations</p>
	Assessment	Mini-tests on each topic	Cumulative assessment Aut 2	Mini-tests on each topic	Cumulative assessment Spr 2	Mini-tests on each topic	Cumulative assessment Sum 2
Year 11 Further Maths Level 2 Set 1	Topic	Number, Algebra and Shape and Space	Number, Shape and Space and Statistics			Revision	Exams
	Content	<p>Number</p> <p>Algebra</p> <p>Fractions, Ratio and Proportion</p> <p>Equations and Inequalities</p> <p>Angles and Trigonometry</p> <p>More Trigonometry</p>	<p>Area and Volume</p> <p>Similarity and Congruence</p> <p>Transformations and Constructions</p> <p>Multiplicative Reasoning</p> <p>Probability</p>			<p>Bespoke Scheme of learning based on question level analysis</p> <p>Walking talking mock exams</p>	

		More Algebra Graphs Equations and Graphs	Interpreting and Representing Data Further Statistics Circle Theorems Vectors and Geometric Proof Proportion and Graphs				
	Assessment	2 GCSE papers	Mini topic tests	3 GCSE Papers			
Year 11 Higher Set 1 - 3	Topic	Circle Theorems; Vectors and geometric proof	Proportion and Graphs	Proportion and Graphs	Revision Exams		Exams
	Content	Radii and chords Tangents Angles in circles 1 Angles in circles 2 Applying circle theorems. Vectors and vector notation Vector arithmetic More vector arithmetic Parallel vectors and collinear points Solving geometric problems.	Direct proportion More direct proportion Inverse proportion Exponential functions Non-linear graphs Translating graphs of functions Reflecting and stretching graphs of functions	Direct proportion More direct proportion Inverse proportion Exponential functions Non-linear graphs Translating graphs of functions Reflecting and stretching graphs of functions	Bespoke Scheme of learning based on question level analysis Walking talking mock exams		
	Assessment	2 GCSE papers	Mini topic tests	3 GCSE Papers			Exams

Year 11 Foundation Set 4 - 7	Topic	Congruence, similarity and vectors	More algebra	More algebra	Revision Exams	Revision Exams	Exams
	Content	Similarity and enlargement More similarity Using similarity Congruence 1 Congruence 2 Vectors 1 Vectors 2	Graphs of cubic and reciprocal functions Non-linear graphs Solving simultaneous equations graphically Solving simultaneous equations algebraically Rearranging formulae Proof.	Graphs of cubic and reciprocal functions Non-linear graphs Solving simultaneous equations graphically Solving simultaneous equations algebraically Rearranging formulae Proof.	Bespoke Scheme of learning based on question level analysis Walking talking mock exams	Bespoke Scheme of learning based on question level analysis Walking talking mock exams	
	Assessment	2 GCSE papers	Mini topic tests	3 GCSE Papers			
Year 11Entry Level (1 – 3) Set 7	Topic	GCSE Algebra	GCSE Algebra	GCSE Revision			Exams
	Content	Algebraic expressions Simplifying expressions Expanding brackets Factorising Solving Equations (including those with x on both sides)	Represent inequalities on a number line Solve two-sided inequalities. Forming and Solving Equations and expressions Know the difference between an expression, an equation, a formula and an identity.	Bespoke schedule based on QLA from Autumn Mock			
	Assessment	2 GCSE papers	Mini topic tests	3 GCSE Papers			
Year 12	Topic	-Algebra and functions	-Kinematics -Trigonometry -Differentiation	-Newton's Laws of motion -Further Kinematics	-Statistical Sampling and Data Presentation	-Regression and Correlation -Probability	-Proof -Algebraic Fractions

		-Coordinate Geometry in the (x,y) plane -Further Algebra	-Integration	-Exponentials and Logrithms -Vectors (2D)	-Probability -Statistical Distributions -Hypothesis Testing	-Normal Distribution -Revision and Exam Preperation	-Functions and Modelling -Series and Sequences -Binomial Theorem
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	Content	Algebraic expressions Quadratics Equations and inequalities Graphs and transformations Straight line graphs Circles Algebraic methods The binomial expansion	Quantities and Units in Mechanics Y1 Modelling in Mechanics & Kinematics 1 Constant Acceleration Trigonometric ratios Trigonometric identities and equations Differentiating polynomials, gradients, tangents and normal Differentiation Increasing/decreasing functions, Second order derivatives, Stationary points, Sketching gradient functions, Modelling Integrating polynomials, Functions given a gradient function, Definite integration Areas under curves, Areas under x-axis, Areas between curves & lines	Forces and Motion Variable acceleration Exponentials and logarithms Exponential functions, Euler's constant, Modelling, Logarithms Laws of Logarithms, Solving equations using logs, Natural logs, Logs and non-linear data Position vectors, distance between two points, geometric problems Definitions, magnitude/direction, addition and scalar multiplication	Statistical sampling Data Collection Introduction to the Large Data Set Data presentation and interpretation Measures of location and spread Correlation Probability Statistical distributions Hypothesis testing	Probability Using set notation, conditional probability, questioning assumptions Regression and Correlation Using Normal Distribution Hypothesis testing with Normal Distributions	Proof by contradiction, counterexample and direct Partial Fractions Transformation of graphs Modulus functions Arithmetic sequences Geometric sequences Modelling with sequences Using binomial expansion for non integer values of n
	Assessment	Mini topic tests	AUT2 Assessments	SPR1 Assessments	Mini topic tests	SUM1 Assessments	Mini topic tests
Year 13	Topic	-Trigonometry	-Further Differentiation	-Numerical Methods -Moments	EXAM PREP	EXAM PREP	EXAM PREP

		-Parametric Equations -Vectors (3D)	-Further Integration	-Forces and Friction -Further Kinematics			
	Content	Trigonometric Functions Introduction to radians Solving equations using radians Introduction to sec, cosec, cot, trig identities, inverse trig functions Solving trig equations involving cot, sec and cosec Expressing as $R\cos(x+a)$ Parametric Equations 3D Vectors	Differentiate for more complex expressions using: chain rule, product rule and quotient rule Use implicit differentiation Modelling with differentiation Integrating for more complex expressions using: reverse chain rule, substitution, integration by parts Modelling with integration	Using trapezium rule to approximate areas under curves Forces applied at a distance on a rigid body from a pivot point Forces on an inclined plane Forces applied at an angle Resolving forces by splitting into parallel and perpendicular components Using coefficient friction between two surfaces Modelling using Forces and friction	Bespoke prep based on pupil data	Bespoke prep based on pupil data	Bespoke prep based on pupil data
	Assessment	Mini topic tests	AUT2 Assessments	Mini topic tests	Full A Level Papers	Full A Level Papers	Full A Level Papers