

KS3 Mathematics

Curriculum Overview 2020-2021

Core intent of the subject at key stage 3

“Mathematics expresses values that reflect the cosmos, including orderliness, balance, harmony, logic, and abstract beauty.”

— Deepak Chopra

Mathematics is a creative and highly inter-connected discipline that has been developed over centuries, providing the solution to some of history’s most intriguing problems. It is essential to everyday life, critical to science, technology and engineering, and necessary for financial literacy and most forms of employment. A high-quality mathematics education therefore provides a foundation for understanding the world, the ability to reason mathematically, an appreciation of the beauty and power of mathematics, and a sense of enjoyment and curiosity about the subject.

Our curriculum in mathematics aims to develop fluency in the fundamentals of mathematics, including through varied and frequent practice with increasingly complex problems over time, so that students develop conceptual understanding and the ability to recall and apply knowledge rapidly and accurately. We are also striving to allow students to reason mathematically by following a line of enquiry, conjecturing relationships and generalisations, develop mathematical arguments and proofs and make conclusions based on logical inferences. Our intention is also for students to solve problems by applying their mathematics to a variety of routine and non-routine problems with increasing sophistication, including breaking down problems into a series of simpler steps and persevering in seeking solutions; as such resilience is a crucial skill that we will be cultivating in students. Students also need to be able to utilise technology effectively, such as scientific calculators, to perform increasingly complex problems (as well having strong written and mental mathematical skills, not instead of). As the repertoire of mathematical skills that a student possesses grows increasingly more complex, so should the ability of students to use their mathematics to model real life situations.

At key stage 3, we promote equality by working through the breadth of the curriculum at the same pace for all students so that all students can achieve regardless of their starting point. All students at key stage 3 have the option of attending a number of lunchtime clubs in mathematics (Countdown club, 24 club, TT Rockstars club). We extend our highest attaining students through depth and more challenging problem solving, rather than an acceleration of content. At key stage 4, all students continue their mathematical studies on an appropriate GCSE pathway determined by their prior attainment and performance across key stages 2 and 3 to give them the best chance of achieving well in the subject. The GCSE curriculum is also supplemented for the most able students by offering Additional Maths to inspire, motivate and support students in their transition to key stage 5; in all key stages we also enter our most able students into the annual UKMT maths challenge competition. We intend for a high proportion of our students to go on and study or use mathematics in some form post-16; this means that our key stage 4 curriculum needs to be broad enough to cater for students who will go on to study maths at the highest level in our Further Mathematics and STEP preparation classes to those who will study Core Mathematics to complement their A Level choices.

In addition to the obvious intention of preparing students for more advanced mathematical studies, mathematics also prepares students for future learning in other disciplines and improves the cognitive ability in general of students and, as such, is essential for their personal development. The study of mathematics conditions the brain to see connections and builds neural pathways that make the brain stronger for all other things. Mathematical study enhances students' general intelligence and supports the life-long learning of students by: creating a framework in the brain for systematic thinking, developing the ability to solve and analyse problems, stretching the mind to work on unfamiliar tasks with confidence, developing the sequencing skills critical to arriving at accurate results or logical conclusions, promoting caution and care in thinking and deciphering complex mathematical problems to arrive at an accurate answer and learning through trial and error to integrate different principles to arrive at a logical conclusion.

In addition to these disciplinary aspects of the mathematics curriculum, the actual mathematical knowledge and skills that students learn are also vitally important in allowing students to achieve elsewhere in school. Topics studied in mathematics are prerequisite for several disciplines across key stages 3, 4 and 5 such as geography, psychology and economics (to name only a few). Mathematics also provides a theoretical springboard for the ever-evolving STEM sector. Nationally, there are huge shortfalls in job applicants with strong STEM skills and reports estimate that the cost of this shortfall is £1.5 billion each year. Furthermore, occupations in the STEM sector are growing at a rate that nearly is nearly double other sectors which could see this shortfall exacerbated. Our intention is to develop students' abilities sufficiently so that they are able to rise to the challenging opportunities this sector has to offer. In the 21st century science, technology and engineering are constantly changing and have become increasingly important for society. The mathematical principles that govern these areas, however, have not changed and consequently the breadth and depth of our curriculum aims to future-proof our students in this field. This is all in addition to the inspirational and motivating research that claims that candidates with strong maths skills earn on average 11% more in their lifetime.

Mathematics is a discipline which is universal; transcending language and cultural differences. Throughout its rich history, mathematics has adopted elements from around the world and gives students the opportunity to appreciate fundamental truths and create water-tight arguments based on logic and reasoning; as such it helps contribute to the student's spiritual, moral, spiritual and cultural development.

Ultimately, the intention of the maths curriculum is to provide students with the necessary thinking skills and content to be successful in their next stage of life or education.

Assessment

The key principles of feedback in the mathematics department are that feedback should:

1. Be specific, accurate and crystal-clear to students.
2. Look forwards not backwards
3. Inform teachers' planning to secure and further students' learning
4. Place the responsibility on the student to forge their next steps
5. Allow students to feel pride

In addition, the maths department assessment and feedback policy should be manageable in terms of staff workload and allow for the prioritisation of planning ahead of marking.

During mathematics lessons

During a student's mathematics lesson is where they will receive the most feedback about their performance in the subject. Feedback will be given each lesson to students by the teacher, who has the expert knowledge to do so. This may happen in a variety of ways, which include (but are not restricted to):

- Questioning by the class teacher as part of whole class teaching
- Questioning by the class teacher as part of a conversation with individuals or small groups
- Use of mini whiteboards
- Use of Plickers
- Low stakes quizzes
- Teacher circulating the classroom and correcting mathematical and spelling errors
- Use of exit tickets

In addition, feedback is given to students automatically by several online platforms: Times Tables Rockstar and Hegarty Maths.

Information gathered by these forms of assessment should always be used by the class teacher to help decide how best to ensure that students move forward mathematically.

Due to the right/ wrong nature of mathematics, classwork should be self-assessed (or peer-assessed if the teacher deems appropriate). The quality and quantity of student work should be monitored by teachers; this may take place during the lesson or the class teacher may choose to collect student books and monitor this outside of the lesson. In either case, there is no expectation to see written comments from teachers in student books.

Testing is a key component of assessment in mathematics. Each unit of work has a test that accompanies it. Wherever possible, there will be a delay between finishing the unit of work and taking the relevant test. This is to give teachers further insight into what students have *learnt* rather than what they were able to *perform* in lesson. Tests are marked by class teachers and written feedback provided. This may be simply be in the form of ticks, crosses and an overall score or if a key error or misconception has been identified then more detailed feedback would be given (if enough students have made the same error or misconception then this may be addressed with the whole class in lesson time rather than giving written feedback to each student). Records of student scores are stored by class teachers and progress is tracked internally using Edexcel steps. Additional feedback is provided for mock exams in key stage 4 to make these assessments as meaningful as possible for the students. Students are provided with individualised question level analysis from their mock exams which is cross-referenced against Hegarty Maths clips to allow students to work independently to address their targets.

Homework

Hegarty Maths homework – a Hegarty maths task is set for students to complete as homework each* week. The Hegarty maths task will be set on something that students have learnt previously. The reason for this is twofold: to allow students the opportunity to practice retrieving the subject content and to allow staff the opportunity to see what students have *learnt* rather than *performed* in a previous lesson. Hegarty

Maths homework tasks are to be completed in a designated Hegarty Maths book. The homework is a written homework that is marked online (there is an option for students to complete their homework during a Monday lunchtime if they found the task too challenging or if there are internet issues or similar). Students should self-assess their homework and it should be clear to their subject teacher which questions were answered correctly and which were not. The quality of homework is monitored each week in the first lesson after the homework deadline; this will typically be done during lesson time while students are working independently (there is also time here for teachers to offer feedback to individual students if needed). Students are encouraged to leave comments for staff to read when they have answered a question incorrectly. Students should expect a response from their class teacher with some additional help in this case.

*Hegarty Maths homework is suspended for one half term in each of years 7, 8 and 9 to allow students to complete a home learning project (in line with the rest of the school). Certificates are awarded to students for the successful completion of these projects.

Clubs and/or intervention

The following clubs are offered at lunchtimes for Key Stage 3 Mathematics:

- 24 club
- Countdown club
- Times Table Rockstars Club
- UKMT Mentoring

Support is also offered to students on a Monday lunchtime drop-in clinic for students who have found their homework tasks difficult.

Parental/Carer support

Parents/ carer are able to support their child by monitoring the standard of homework tasks as mentioned above. Parents can also promote use of Times Tables Rockstars at home which will help students to become fluent with their basic multiplication facts.

Helpful sources of information

<https://hegartymaths.com/>

<https://www.ukmt.org.uk/>

<https://www.drfrostmaths.com/>

<https://www.mathscareers.org.uk/>

Year 7 Overview

Term	Knowledge	Assessment	Connections to learning	Connections to future pathways
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Autumn	<p>“Without Mathematics there is nothing you can do. Everything around you is mathematics. Everything around you is numbers.” Shakuntala Devi Reinforce and extend all basic number skills from key stage 2</p>			
	<ul style="list-style-type: none"> ➤ Place Value for integers and decimals, ordering, rounding, upper and lower bounds, use estimation to replace values in calculation, powers of ten, multiplying and dividing by powers of ten ➤ Special Numbers: Squares, cubes, roots, primes, multiples, factors, prime factor decomposition, LCM, HCF, Venn diagrams, standard form, higher powers, index rules 	<ul style="list-style-type: none"> ➤ Assessment in this half term follows the marking and feedback policy in the assessment section at the top of this document. ➤ Students will be assessed on the content of this unit between 1 and 2 weeks after finishing the unit. ➤ In addition, students also complete a baseline assessment in this half term. 	<ul style="list-style-type: none"> ➤ Essential for all subsequent maths teaching ➤ Key vocabulary and language reinforced/ introduced ➤ Opportunities for problem solving skills to be developed ➤ Links to Y7 home learning project 	<ul style="list-style-type: none"> ➤ Essential for all subsequent maths teaching and general numeracy across the curriculum
	<p>“Mathematics is the queen of science, and arithmetic the queen of mathematics” Carl Friedrich Gauss Reinforce and extend all basic number skills from key stage 2</p>			
<ul style="list-style-type: none"> ➤ Calculations; addition, subtraction, multiplication and division, problem solving, product rule for counting calculating with negatives, order of operations 	<ul style="list-style-type: none"> ➤ Assessment in this half term follows the marking and feedback policy in the assessment section at the top of this document. 	<ul style="list-style-type: none"> ➤ Essential for all subsequent maths teaching ➤ Key vocabulary and language reinforced/ introduced 	<ul style="list-style-type: none"> ➤ Essential for all subsequent maths teaching and general numeracy across the curriculum 	

		<ul style="list-style-type: none"> ➤ Students will be assessed on the content of this unit between 1 and 2 weeks after finishing the unit 	<ul style="list-style-type: none"> ➤ Opportunities for problem solving skills to be developed ➤ Links to Y7 home learning project 	
Spring	<p align="center">“An ounce of algebra is worth a ton of verbal argument” John B. S. Haldane Ensure secure foundation of algebraic concepts ready to be built on with more advanced skills</p>			
	<ul style="list-style-type: none"> ➤ Algebraic notation, expressions, simplifying, substituting, expanding and factorising ➤ Solving equations linear, brackets, unknowns both sides 	<ul style="list-style-type: none"> ➤ Assessment in this half term follows the marking and feedback policy in the assessment section at the top of this document. ➤ Students will be assessed on the content of this unit between 1 and 2 weeks after finishing the unit 	<ul style="list-style-type: none"> ➤ Key vocabulary and notation introduced which underpins the rest of algebra from years 7 – 13 ➤ Modelling of real-life situations introduced ➤ Opportunities for problem solving skills to be developed 	<ul style="list-style-type: none"> ➤ Substitution into formulae introduced at this point which will be used in: physics, chemistry, biology, business studies, computer science, psychology, ICT, geography
	<p align="center">“A man is like a fraction whose numerator is what he is and whose denominator is what he thinks of himself. The larger the denominator the smaller the fraction.” Leo Tolstoy Develop mathematical fluency in converting fractions and decimals. Learn skills in arithmetic with fractions and decimals</p>			
	<ul style="list-style-type: none"> ➤ Fractions and Decimals, (use bar diagrams) equivalencies (fractions to decimals), equivalent fractions and cancelling, 	<ul style="list-style-type: none"> ➤ Assessment in this half term follows the marking and feedback policy in the assessment section at 	<ul style="list-style-type: none"> ➤ Links to first number units, in particular place value and operations. ➤ Links to first geometry unit (measures) 	<ul style="list-style-type: none"> ➤ Decimals linked to anything involving money ➤ Links to all of the sciences, geography, psychology, BITE

	<p>adding and subtraction, mixed numbers and improper fractions. Multiplication and fractions of amounts.</p>	<p>the top of this document.</p> <ul style="list-style-type: none"> ➤ Students will be assessed on the content of this unit between 1 and 2 weeks after finishing the unit 	<ul style="list-style-type: none"> ➤ Links to subsequent number and algebra units 	
Summer	<p align="center">“Learn how to see. Realise that everything connects to everything else” Leonardo da Vinci Learn how to represent sequences algebraically. Describe how to get terms from positions and previous terms</p>			
	<ul style="list-style-type: none"> ➤ Sequences: continuing, term to term, nth term, recognition of arithmetic, geometric, Fibonacci 	<ul style="list-style-type: none"> ➤ Assessment in this half term follows the marking and feedback policy in the assessment section at the top of this document. ➤ Students will be assessed on the content of this unit between 1 and 2 weeks after finishing the unit 	<ul style="list-style-type: none"> ➤ Links to Y9 home learning project ➤ Links to business studies, medicine, ➤ Links to financial topics (e.g. compound interest) 	<ul style="list-style-type: none"> ➤ Fibonacci sequences give rise to lots of opportunity for enrichment such as galaxy formations, nature, weather patterns ➤ Linked to biology, DNA, population modelling
	<p align="center">“Statistics is the grammar of science” Karl Pearson Understand how to use a single number to represent a set of data and to calculate the range of the data</p>			
	<ul style="list-style-type: none"> ➤ Types of data, averages and range: Mean, median, mode and 	<ul style="list-style-type: none"> ➤ Assessment in this half term follows the marking and feedback 	<ul style="list-style-type: none"> ➤ Links to previous unit on calculations 	<ul style="list-style-type: none"> ➤ Averages and range used in any other curriculum which uses data

	range, mean from frequency tables, estimated mean	policy in the assessment section at the top of this document. ➤ Students will be assessed on the content at the end of the unit.	<ul style="list-style-type: none"> ➤ Key vocabulary introduced (average vs mean) ➤ Use of technology/ scientific calculators 	(e.g. geography, psychology, biology, BITE) <ul style="list-style-type: none"> ➤ Any individual working in industry as an adult will use data ➤ Used to analyse data in sport ➤ Used throughout school to analyse test scores/ GCSE results etc
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Year 8 Overview

Term	Knowledge	Assessment	Connections to learning	Connections to future pathways
	<p>“The mathematician’s patterns must be beautiful. Beauty is the first test; there is no permanent place in the world for ugly mathematics.” G. H. Hardy</p> <p>Understand how to manipulate formulae (involving indices) Extend variety of equations that are able to be solved</p>			
Autumn	<ul style="list-style-type: none"> ➤ Algebraic manipulation, expanding and factorising quadratics, solving quadratics by factorisation. ➤ Revise fractions, addition, subtraction, multiplication and revision, percentages (equivalence and percentage change) and decimals including \times and \div by 0.1, 0.01, multiplicative reasoning. 	<ul style="list-style-type: none"> ➤ Assessment in this half term follows the marking and feedback policy in the assessment section at the top of this document. ➤ Students will be assessed on the content of this unit between 1 and 2 weeks after finishing the unit 	<ul style="list-style-type: none"> ➤ Builds on year 7 content involving equations and formulae ➤ Key concepts that need to be understood in GCSE (including quadratic equations and simultaneous equations) ➤ Further opportunities for students to model real-life situations as mathematical equations 	<ul style="list-style-type: none"> ➤ Rearranging formulae needed in the sciences, geography, psychology, BITE ➤ Algebra skills here used a lot in KS5 science ➤ Algebra used extensively in computer animation ➤ Quadratics arise in physics a lot when modelling kinematics using $s=ut+(1/2)at^2$

	<p style="text-align: center;">“Geometry is the art of correct reasoning from incorrectly drawn figures” Henri Poincaré</p> <p style="text-align: center;">Build on year 7 angles knowledge to allow students to be able to solve a greater variety of problems involving angles</p>			
	<ul style="list-style-type: none"> ➤ Properties of 2D shapes, lines and angles including parallel lines, angle sums and polygons, geometric reasoning (proof) 	<ul style="list-style-type: none"> ➤ Assessment in this half term follows the marking and feedback policy in the assessment section at the top of this document. ➤ Students will be assessed on the content of this unit between 1 and 2 weeks after finishing the unit 	<ul style="list-style-type: none"> ➤ Key vocabulary and language reinforced/ introduced ➤ Essential for subsequent geometry skills ➤ Opportunities for problem solving skills to be developed ➤ Geometric reasoning developed and constructing a logical, reasoned argument 	<ul style="list-style-type: none"> ➤ Links to STEM subjects; specifically technology, design, art, architecture and engineering ➤ Bearings/ angles/ scales in particular links to map skills and Duke of Edinburgh ➤ Precision in geometry needed for careers in architecture, engineering and design
Spring	<p style="text-align: center;">Concrete Pictorial Abstract</p> <p style="text-align: center;">Extend understanding of measures to more complex ones such as speed and density Understanding how to find, represent and interpret likelihood in a variety of different contexts</p>			
	<ul style="list-style-type: none"> ➤ Ratio and Proportion know and use notation, simplify, share in given ratio, include bar model and problem solving including combining ratios. ➤ Probability including and/or laws, sample spaces, frequency trees, 	<ul style="list-style-type: none"> ➤ Assessment in this half term follows the marking and feedback policy in the assessment section at the top of this document. ➤ Students will be assessed on the content of this unit 	<ul style="list-style-type: none"> ➤ Problem solving skills developed – especially use of diagrams to help (bar modelling) ➤ Links to previous fractions unit ➤ Underpins several major skills in the GCSE 	<ul style="list-style-type: none"> ➤ Scales used in map reading ➤ Proportionality used in food tech to change recipes, art to change colour shades ➤ Probability used in the following career areas: market research analyst, atmospheric scientist, meteorologist, statistician, operations research analyst, insurance broker, financial

	<p>probability trees, two way tables and Venn diagrams, conditional probability, probability using algebraic terms.</p>	<p>between 1 and 2 weeks after finishing the unit</p>	<ul style="list-style-type: none"> ➤ Problem solving skills developed by extended variety of diagrams that students are able to draw to help solve problems ➤ Links to prior learning using ratio, proportion, FDPs 	<p>analyst, psychologist, research developer, sports statisticians, advertising, actuarial sciences</p> <ul style="list-style-type: none"> ➤ Understanding risk inherent in this topic
<p>“Geometry is that part of universal mechanics which accurately proposes and demonstrates the art of measuring” Sir Isaac Newton Develop students’ spatial awareness and understand measurements in real-life</p>				
	<ul style="list-style-type: none"> ➤ Units of measurement, perimeter of compound shapes, area of any 2D shape, names and properties of 3D shapes, volume prisms and cylinders. 	<ul style="list-style-type: none"> ➤ Assessment in this half term follows the marking and feedback policy in the assessment section at the top of this document. ➤ Students will be assessed on the content of this unit between 1 and 2 weeks after finishing the unit 	<ul style="list-style-type: none"> ➤ Links to year 7 content on measuring angles, using scales, symmetry ➤ Links to calculations work in year 7 (needing to multiply, divide to calculate e.g.) ➤ Develop ability to reason geometrically 	<ul style="list-style-type: none"> ➤ Used in areas such as product design, architecture, photographer, landscape gardener, construction, cartography, photogrammetrist, drafter, surveyor, regional planner, mechanical engineer
<p>Summer</p>	<p>“Resolve each difficulty into as many parts as is feasible and necessary to resolve it” René Descartes Understand the link between algebra and geometry Develop spatial awareness of students and ability to articulate mathematically</p>			

<ul style="list-style-type: none"> ➤ Coordinate geometry, linear graphs, real life graphs including rates of change and compound measures. ➤ Symmetry and rotation, transformations: reflection, rotation, translation, enlargement including fractional and negative, congruency and tessellations including why some shapes don't tessellate. 	<ul style="list-style-type: none"> ➤ Assessment in this half term follows the marking and feedback policy in the assessment section at the top of this document. ➤ Students will be assessed on the content of this unit between 1 and 2 weeks after finishing the unit 	<ul style="list-style-type: none"> ➤ Crucial for studying maths (and further maths) at GCSE and A Level ➤ Use of technology (using calculators to generate a table of values) ➤ Real-life graphs linked to subsequent learning and other curriculum areas ➤ Preparatory work for matrices in key stage 5 	<ul style="list-style-type: none"> ➤ Linked to rates of change and financial work ➤ Linear programming relies on this unit ➤ Regression analysis uses coordinate geometry ➤ Exchange rates and conversion graphs used in real-life ➤ Sciences use this to figure out formulae linking two variables ➤ Careers: aviation, rocketry, space science and space flight ➤ Links to graphics, design, art and computing
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**“Facts are stubborn but statistics are more pliable.”
Mark Twain**

Have an awareness of how data is presented in the media and businesses. Be able to present data in a suitable manner for an audience

<ul style="list-style-type: none"> ➤ Collecting and representing data, sampling pie charts, line graphs, stem and leaf, dual and composite barcharts 	<ul style="list-style-type: none"> ➤ Assessment in this half term follows the marking and feedback policy in the assessment section at the top of this document. ➤ Students will be assessed on the content of this unit between 1 and 2 weeks after finishing the unit 	<ul style="list-style-type: none"> ➤ Links to previous learning on data ➤ Crucial for any student studying GCSE statistics or A Level statistics ➤ Opportunities provided to develop literacy through analysing and interpreting data ➤ Links to proportional reasoning (pie charts) 	<ul style="list-style-type: none"> ➤ Data presentation used in a variety of subject areas (e.g. geography, psychology, biology, BITE) ➤ Any individual working in industry as an adult will use data ➤ Used to analyse data in sport ➤ Used throughout school to analyse test scores/ GCSE results etc
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Year 9 Overview

Term	Knowledge	Assessment	Connections to learning	Connections to future pathways
Autumn	<p align="center">“Algebra is the intellectual instrument which has been created for rendering clear the quantitative aspects of the world.” Alfred North Whitehead</p> <p>Extend number sense to incorporate irrational numbers To understand formulae in a variety of contexts and develop algebra skills</p>			
	<ul style="list-style-type: none"> ➤ Consolidate powers and roots if required. Indices including fractional indices and simple surds. Estimating powers and roots of any given number ➤ Consolidate solving linear and quadratic equations if required; simultaneous equations and inequalities including inequations, number lines and graphical representations rearranging formulae 	<ul style="list-style-type: none"> ➤ Assessment in this half term follows the marking and feedback policy in the assessment section at the top of this document. ➤ Students will be assessed on the content of this unit between 1 and 2 weeks after finishing the unit 	<ul style="list-style-type: none"> ➤ Links to prior learning are explicit as a lot of this content is developing previous skills ➤ Iteration is introduced here and is an important skill for GCSE and A Level 	<ul style="list-style-type: none"> ➤ Standard form used extensively in science ➤ Multiplicative reasoning used in a variety of contexts across the curriculum as mentioned above ➤ Essential for coordinate geometry and linear programming at A Level ➤ Rearranging formulae needed in the sciences, geography, psychology, BITE ➤ Algebra skills here used a lot in KS5 science ➤ Algebra used extensively in computer animation ➤ Quadratics arise in physics a lot when modelling kinematics using $s=ut+(1/2)at^2$
	<p align="center">“It is the mark of a truly intelligent person to be moved by statistics” George Bernard Shaw</p> <p>Extend students understanding of data to include more sophisticated data techniques</p>			
<ul style="list-style-type: none"> ➤ Averages and range, cumulative frequency, 	<ul style="list-style-type: none"> ➤ Assessment in this half term follows the marking and feedback 	<ul style="list-style-type: none"> ➤ Links to all previous data topics 	<ul style="list-style-type: none"> ➤ This content is made use of in the following areas: business studies, 	

	box plots, quartiles and IQR	<p>policy in the assessment section at the top of this document.</p> <ul style="list-style-type: none"> ➤ Students will be assessed on the content of this unit between 1 and 2 weeks after finishing the unit 	<ul style="list-style-type: none"> ➤ Prepares students for studying A Level maths, Core Maths ➤ Provides opportunity for literacy as a focus of this unit is interpretation of data and charts ➤ Use of technology using Excel to display data 	sciences, psychology, geography, social sciences
Spring	<p>“Compound interest is the eighth wonder of the world. He who understands it, earns it... he who doesn't, pays it.” Albert Einstein</p> <p>Provide students with understanding of percentages to be used and understood in a variety of contexts, especially financial contexts.</p>			
	<ul style="list-style-type: none"> ➤ Constructions and Loci Constructing line and angle bisectors, triangles including equilateral triangles, perpendicular from and to a point, angles of 60°, 45°, loci and scale drawing problems ➤ Consolidate percentages, ratio and proportion compound measures. Direct and indirect proportion, percentage change, reverse percentages and growth and decay. 	<ul style="list-style-type: none"> ➤ Assessment in this half term follows the marking and feedback policy in the assessment section at the top of this document. ➤ Students will be assessed on the content of this unit between 1 and 2 weeks after finishing the unit 	<ul style="list-style-type: none"> ➤ Links to financial topics (e.g. compound) ➤ Problem solving skills developed – especially use of diagrams to help (bar modelling) ➤ Links to previous fractions unit ➤ Underpins several major skills in the GCSE 	<ul style="list-style-type: none"> ➤ Proportionality used in food tech to change recipes, art to change colour shades ➤ Work on percentage growth and decay is vital for students' understanding of financial situations in future life.
	<p>“The right angle is one of the world's basic shapes.”</p>			

Claes Oldenburg

To extend problem solving skills to allow students to solve a wider variety of geometric problems

<ul style="list-style-type: none"> ➤ Consolidate angles including those in triangles if required. Pythagoras and trig in right angled triangles. Area of any triangle using sine. 	<ul style="list-style-type: none"> ➤ Assessment in this half term follows the marking and feedback policy in the assessment section at the top of this document. ➤ Students will be assessed on the content of this unit between 1 and 2 weeks after finishing the unit 	<ul style="list-style-type: none"> ➤ Links to prior knowledge: indices, surds, similarity, accurate drawing and compass use ➤ Pythagoras' theorem and trigonometry are essential skills for studying maths (and further maths) at GCSE and A Level 	<ul style="list-style-type: none"> ➤ These skills are used in: construction, architecture, physics, design, seismology, civil engineering, oceanography, cartography, acoustics, game design
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“I heave the basketball; I know it all sails in a parabola, exhibiting perfect symmetry, which is interrupted by the basket. It’s funny, but it is always interrupted by the basket.”

Michael Jordan

Give students understanding of graphs and functions that are going to be used throughout GCSE and A Level mathematics.

Summer

<ul style="list-style-type: none"> ➤ Quadratic, cubics, and reciprocal graphs. 	<ul style="list-style-type: none"> ➤ Assessment in this half term follows the marking and feedback policy in the assessment section at the top of this document. ➤ Students will be assessed on the content of this unit between 1 and 2 weeks after finishing the unit 	<ul style="list-style-type: none"> ➤ Builds on understanding of quadratic expressions from year 8 and linear coordinate geometry ➤ Use of technology to generate tables of values ➤ Essential content for studying maths (and further maths) at A Level 	<ul style="list-style-type: none"> ➤ Physics, economics both make use of this area
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Opportunity to recap some of the trickier bits from Key Stage 3 and deepen understanding of 3D geometry by linking it to earlier work on trigonometry, Pythagoras and algebra

➤ Consolidate basic 3D Shapes and area and volume of cylinders and cuboids. Surface area and volume (including using Pythagoras), spheres, cones, frustums and pyramids

➤ Assessment in this half term follows the marking and feedback policy in the assessment section at the top of this document.
➤ Students will be assessed on the content of this unit between 1 and 2 weeks after finishing the unit

➤ Links to year 7 content on measuring angles, using scales, symmetry
➤ Links to calculations work in year 7 (needing to multiply, divide to calculate e.g.)
➤ Links to earlier year 9 work on trigonometry and pythagoras
➤ Develop ability to reason geometrically

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➤ Links to calculations work in year 7 (needing to multiply, divide to calculate e.g.)
➤ Develop ability to reason geometrically