

Subject overview: (KS3 Maths)

Subject Rationale (Intent) linked to [whole school curriculum mission](#)

In brief (no more than four sentences)

The aim of the Mathematics Department is to encourage and develop mathematical independence, providing all pupils with the functional skills to flourish in their future careers. We believe in promoting an understanding of mathematical concepts, employing a problem solving approach to develop transferable skills and fostering an appreciation of mathematics as a creative and beautiful subject.

Maths at St Edmund's develops a love for the subject through all students knowing the satisfaction of solving mathematical problems. We enable students to think for themselves, giving them the mathematical knowledge and skills to confidently justify their answers to today and tomorrow's, abstract and real life problems. Students will be able to apply their skills across the curriculum and beyond; they will understand that mathematics is a universal language that underpins everything.

Additional details

By the end of year 9 all students will have procedural fluency and a bank of key skills in topics such as, percentages, ratio, fractions, negative numbers, basic algebraic expressions, solving equations, graphs and functions. They will also have a developing conceptual understanding that allows them to see the 'why and how' of mathematics, and where methods and procedures can (and cannot) be applied. Students will be able to solve increasingly complex problems through recall, generalising, organising information, breaking them down, modelling, predicting and applying most efficient methods.

Subject Rationale (Implementation) linked to [whole school curriculum mission](#)

This will be delivered using the Oxford Smart Curriculum for Maths (using textbooks) which provides a clear and coherent progression which is matched to the DfE sample KS3 curriculum framework and recommended sequencing suggested by NCETM. Close attention is paid to the sequencing of concepts, connections with prior learning, common difficulties and misconceptions, and consistent use of key models and language. Curriculum narratives show where key mathematical themes are addressed and how KS3 learning fits into the bigger picture of KS1-KS4.

This is delivered by KS3 teachers using the Craig Barton Learning Episode Model:

- Diagnostic Questions - Checking prior knowledge and identifying early on any misconceptions in understanding, addressing these and asking deeper questions relating to them
- Example-Problem Pair - Modelling procedural knowledge to students, using I do, We do, You do using questioning for deeper thinking and discussion to check understanding, then fluency practice.
- Intelligent Practice - Sequenced questions that are linked to each other to study relationships between the varied questions, asking students to Reflect, Expect, Check, Explain.
- Method Selection - Develop confidence and competence on when to select the appropriate rule and how to apply it in differing contexts.
- Purposeful Practice - Independent, paired and grouped problem solving where pupils are able to tackle challenging and stretching questions that call on skills developed in this and previous lessons.
- Watch Out - Time for students to evaluate, explain and discuss mistakes and correct them.

YEAR 7

TERM	Topic sequence (What are you teaching?)	Topic sequence rationale (Why are you teaching this? How does it link to prior learning? Any notable links to St Edmund's curriculum mission)	Main method of assessment?
Term 1:1	Place Value <ul style="list-style-type: none"> • Place value in integers • Place value in decimals • Ordering and comparing numbers • Measures 	Place Value Why Taught? This is taught so that students are aware of the general structure of the place-value system as based on powers of ten and begin to see how this naturally extends to decimals. This learning supports students' work on significant figures and standard form which then supports students' understanding of, and facility with, estimating and rounding. Prior Learning Prior learning of place values involves being able to read, write, order and compare numbers up to 10 00 000, rounding whole numbers, multiplying and dividing by 10,100 and 1000. Why Now? The decimal number system is the basic building block that all other mathematics depends on and a firm grasp of this is essential before further explorations and discoveries can be made.	Unit mini-tests Diagnostic and hinge questions Kerboodle Mini quizzes on line

	<p>Properties of numbers</p> <ul style="list-style-type: none"> • Multiples • Powers and roots • Factors and prime factorisation 	<p><u>Properties of numbers</u></p> <p>Why Taught? Expressing numbers as the product of prime factors will enable students to reason about and identify the HCF and LCM, and to appreciate this as a more efficient method than listing in some situations. From KS2 learning, students should recognise square and cube numbers and use appropriate notation - they can then build on this by using other positive integer exponents greater than three, and associated real roots.</p> <p>Prior Learning Prior knowledge includes being able to find factors and multiples of positive whole numbers, including common factors and common multiples, and express a given number as a product of 2 or 3 factors.</p> <p>Why Now? This leads on from understanding place value and the number system and gives deeper meaning to the way numbers are categorised and connected.</p>	
<p>Term 1:2</p>	<p>Arithmetic</p> <ul style="list-style-type: none"> • Addition and subtraction with negative integers • Multiplication and division with negative integers • Addition and subtraction with decimals • Multiplication and division with decimals • Efficient calculations 	<p><u>Arithmetic</u></p> <p>Why Taught? This is taught to ensure students have a strong understanding of the mathematical structures that underpin these standard procedures. Also, it ensures students generalise these standard procedures with integers, extend to use with decimals, and appreciate that the structures are the same. Moreover, teaching this builds on students' experiences of positive and negative numbers to develop a full understanding and fluency with procedures for all four operations with directed numbers.</p> <p>Prior Learning Prior learning on this topic involves understanding that 2 numbers can be related additively or multiplicatively, and quantify additive and multiplicative relationships. From KS2, students should already be able to use a given additive or multiplicative calculation to derive or complete a related calculation, using arithmetic properties, inverse relationships, and place-value understanding. They should also be able to multiply and divide any whole number with up to 4 digits by any one-digit number using a formal written method.</p> <p>Why Now? Use of the four operations is fundamental to being able to be numerate and underpins student's ability to be able to confidently tackle solving simple and more complex number and algebra topics in the future.</p>	<p>Unit mini-tests</p> <p>Diagnostic questions</p> <p>Kerboodle mini quizzes on line</p> <p>Termly assessment covering all material from the start of the year.</p>

	<p>Expressions and equations</p> <ul style="list-style-type: none"> ● Introduction to algebra ● Formulae and equations ● Simplifying and expressions ● Using the distributive law 	<p><u>Expressions and equations</u></p> <p>Why Taught? Expressions and equations are taught so that students understand that relationships can be generalised using algebraic statements. This then helps them to understand that substituting particular values into a generalised algebraic statement gives a sense of how the value of the expression changes. Learning this gives them the opportunity to apply their understanding of the distributive law to a range of problem-solving situations and contexts (including collecting like terms, multiplying an expression by a single term and factorising).</p> <p>Prior Learning Before being taught this in KS3, students should be able to use a given additive or multiplicative calculation to derive or complete a related calculation, using arithmetic properties, inverse relationships, and place-value understanding. They should also be comfortable with solving problems with 2 unknowns.</p> <p>Why Now? This is a vital jump to allow students to generalise and model problems, formulate and prove arguments and find solutions to these problems using algebra, which is seen throughout KS3, KS4 and KS5</p>	
<p>Term 2:1</p>	<p>Expressions and equations cont.</p> <p>Coordinates</p> <ul style="list-style-type: none"> ● Connecting coordinates, equations and graphs ● Graphical representations 	<p><u>Coordinates</u></p> <p>Why Taught? A key focus will be thinking about x- and y- coordinates as the input and output respectively of a function or rule, and appreciating that the set of coordinates generated and the line joining them can be seen as a graphical representation of that function. Students can then explore linear relationships and their representation as straight line graphs.</p> <p>Prior Learning From prior learning, students should be able to draw polygons, specified by coordinates in the first quadrant, and translate within the first quadrant.</p> <p>Why Now? Students need to be aware of how to represent relationships using cartesian coordinates and diagrams, now that they are able to apply the four operations confidently, these rules can also be applied to the realm of the 4 quadrants of a cartesian grid.</p>	<p>Unit mini-tests</p> <p>Diagnostic and hinge questions</p> <p>Kerboodle Mini quizzes on line</p>

<p>Term 2:2</p>	<p>Perimeter and area</p> <ul style="list-style-type: none"> ● Properties of triangles and quadrilaterals ● Perimeter ● Area <p>Fractions</p> <ul style="list-style-type: none"> ● Decimals and fractions ● Comparing and ordering fractions ● Adding and subtracting fractions ● Multiplying and dividing fractions 	<p><u>Perimeter and area</u></p> <p>Why Taught? Students should fully understand the concepts involved in finding the perimeter and area of a shape, appreciate how the various formulae are derived and connected, and reason mathematically to solve a wide range of problems, including both new and unfamiliar situations. When calculating perimeters, students will use the properties of parallelograms, isosceles triangles and trapezia, as well as non-standard shapes, and reason mathematically to deduce missing information.</p> <p>Prior Learning From KS2, students should be able to find the perimeter of regular and irregular polygons, compare areas and calculate the area of rectangles (including squares) using standard units. They should also already be able to draw, compose, and decompose shapes according to given properties, including dimensions, angles and area, and solve related problems.</p> <p>Why Now? Using and applying their knowledge of the four operations is now being applied in context along with learning and developing understanding of other facts about the properties of shape.</p> <p><u>Fractions</u></p> <p>Why Taught? Fractions are taught so that students can appreciate the interconnected nature of fractions and decimals and be able to order and compare them. At KS3, students will further develop their understanding of the different ways that numbers can be expressed - this develops their awareness that different representations of the same number can reveal something of its structure and so can be used to compare and order numbers with ease.</p> <p>Prior Learning Prior knowledge to this topic includes being able to find equivalent fractions and understand that they have the same value and the same position in the linear number system. From prior knowledge, students should be able to compare fractions with different denominators, including fractions greater than 1, using reasoning, and choose between reasoning and common denomination as a comparison strategy.</p> <p>Why Now? Students are now gaining greater confidence and need to extend their understanding into being able to handle fractions if and when they occur in shape, algebra or number problems.</p>	<p>Unit mini-tests</p> <p>Diagnostic questions</p> <p>Mini quizzes on line</p> <p>Termly assessment covering all material from the start of the year.</p>
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<p>Term 3:1</p>	<p>Fractions cont.</p> <p>Fractions and ratio</p> <ul style="list-style-type: none"> ● Multiplicative relationships ● Representing multiplicative relationships ● Using fractions ● Using ratios 	<p><u>Fractions and ratio</u></p> <p>Why Taught?</p> <p>There are several different possible representations that could be used to help understand the mathematical structure of a situation. Also, it is important to consider the relative usefulness and efficiency of different representations and approaches. Therefore, this topic is taught in KS3 to connect these contexts through the overarching idea of multiplicative relationships. Teaching this topic further ensures students do not simply view multiplication as repeated addition, because this could lead to incorrect additive strategies. Students experience multiplicative relationships in contexts to overcome such errors.</p> <p>Prior Learning</p> <p>From prior learning, students should understand that 2 numbers can be related additively or multiplicatively and quantify additive and multiplicative relationships. They should be able to use a given additive or multiplicative calculation to derive or complete a related calculation, using arithmetic properties, inverse relationships, and place-value understanding. In addition, they should also be able to solve problems with 2 unknowns as well as problems involving ratio relationships.</p> <p>Why Now?</p> <p>Leading on from the fraction work, student's need to see the relationship that fractions have with ratios to prepare themselves for being able to fluently convert between the two. Ratio can appear in many branches of mathematics so is a key skill to master in KS3.</p>	<p>Unit mini-tests</p> <p>Diagnostic and hinge questions</p> <p>Kerboodle Mini quizzes on line</p>
<p>Term 3:2</p>	<p>Transformations</p> <ul style="list-style-type: none"> ● Translations ● Rotations ● Reflections ● Scale diagrams ● Enlargements 	<p><u>Transformations</u></p> <p>Why Taught?</p> <p>Transformations are taught because they describe different ways of mapping points on a plane to other points on the plane. It allows students to consider what changes and what stays the same under different transformations, allowing for discussion about congruence and similarity.</p> <p>Prior Learning</p> <p>From previous knowledge, students should be able to draw polygons, specified by coordinates in the first quadrant, and translate within the first quadrant. They should also be able to identify line symmetry in 2D shapes presented in different orientations, reflect shapes in a line of symmetry and complete a symmetric figure or pattern with respect to a specified line of symmetry.</p> <p>Why Now?</p> <p>Having learnt about coordinates previously in the year, students are now able to tackle questions relating to using the rules of transformations on a cartesian grid.</p>	<p>Unit mini-tests</p> <p>Diagnostic and hinge questions</p> <p>Kerboodle mini quizzes on line</p> <p>Termly assessment covering all material from the start of the year.</p>

YEAR 8

TERM	Topic sequence (What are you teaching?)	Topic sequence rationale (Why are you teaching this? How does it link to prior learning? Any notable links to St Edmund's curriculum mission)	Main method of assessment?
Term 1:1	<p>Estimating and rounding</p> <ul style="list-style-type: none"> ● Rounding to decimal places ● Rounding to significant figures ● Estimation <p>Solving Linear equations</p> <ul style="list-style-type: none"> ● Solutions to linear equations ● One-step linear equations ● Two-step linear equations ● Linear equations with brackets and fractions 	<p>Estimating and rounding</p> <p>Why Taught? It is essential that students are aware of the general structure of the place-value system as being based on powers of ten and begin to see how this naturally extends to decimals. This learning will support students' work on significant figures and standard form, as students who can express numbers in these different ways are more likely to have a feel for the size of the numbers and where they fit in the number system. It is also important to emphasise the use of measures in real-life contexts - this supports students' understanding that measuring is always to a degree of accuracy.</p> <p>Prior Learning Prior learning includes being able to read, write, order and compare numbers up to 10 00 000, rounding whole numbers to a certain degree of accuracy , multiplying and dividing by 10,100 and 1000.</p> <p>Why Now?</p> <p>Solving Linear equations</p> <p>Why Taught? It is important for students to appreciate that number and algebra are connected. The solving of equations is essentially concerned with operations on as yet unknown numbers. It explores how linear equations are effectively the formulation of a series of operations on unknown numbers, and how the solving of such equations is concerned with undoing these operations to find the value of the unknown.</p> <p>Prior Learning In KS2, students should have been taught how to express number problems algebraically, how to find pairs of numbers that satisfy an equation with two unknowns and how to enumerate possibilities of combinations of two variables. Earlier in KS3, students were taught how to simplify algebraic expressions by collecting like terms to maintain equivalence as well as how to manipulate algebraic expressions using the distributive law to maintain equivalence.</p>	<p>Unit mini-tests</p> <p>Diagnostic and hinge questions</p> <p>Kerboodle mini quizzes on line</p>

		Why Now?	
Term 1:2	<p>Sequences</p> <ul style="list-style-type: none"> • Features of sequences • Arithmetic sequences <p>Linear Graphs</p> <ul style="list-style-type: none"> • Connect coordinates, equations and graphs • Linear relationships 	<p>Sequences Why Taught? Students should consolidate, secure and deepen their understanding of linear sequences and how to find and use term-to-term rules to generate the next term. They can then progress to describing any term in the sequence directly in relation to its position in the sequence. This work extends students' knowledge of sequences through exploration of the mathematical structure, not just by spotting the patterns that the structure creates. Prior Learning Before beginning sequences at Key Stage 3, students should be secure with generating and describing linear number sequences and being able to use simple formulae Why Now?</p> <p>Linear Graphs Why Taught? After thoroughly exploring the structure of linear relationships, students should have experience of other functions and relationships (especially quadratic ones) , be able to use graphs to solve problems in real-life contexts and understand how linear graphs can be used to find solutions to simultaneous equations. Prior Learning Before beginning graphical representations of linear relationships at KS3, students should already have an understanding of describing positions on the full coordinate grid, finding pairs of numbers that satisfy an equation with two unknowns and enumerate possibilities of combinations of two variables.</p>	<p>Unit mini-tests</p> <p>Diagnostic and hinge questions</p> <p>Kerboodle mini quizzes on line</p> <p>Termly assessment covering all material from the start of the year.</p>
Term 2:1	<p>Linear Graphs cont.</p> <p>Percentages and proportionality</p> <ul style="list-style-type: none"> • Representations of multiplicative relationships • Percentages 	<p>Percentages and proportionality Why Taught? Percentages, fractions, proportionality and ratio can all be considered as contexts in which multiplicative relationships are used and explored. Exploring a range of real-life contexts will further support students'</p>	<p>Unit mini-tests</p> <p>Diagnostic and hinge questions</p> <p>Kerboodle mini</p>

	<ul style="list-style-type: none"> ● Proportionality 	<p>understanding of proportionality. Stressing the notion that, when one measure doubles so too does the other, can usefully highlight the terminology of “direct” proportion and this can be contrasted with inverse proportion, which is a key idea introduced at KS3.</p> <p>Prior Learning Before beginning multiplicative relationships at KS3, students should already be able to recognise the per cent symbol and understand that per cent relates to “number of parts per hundred”, and write percentages as fractions with denominator 100. They should already be able to use all four operations to solve problems involving measures using decimal notation, including scaling. Another ability they should have from prior learning is being able to solve problems involving the relative sizes of two quantities where missing values can be found by using integer multiplication and division facts.</p> <p>Why Now?</p>	<p>quizzes on line</p>
<p>Term 2:2</p>	<p>Statistics</p> <ul style="list-style-type: none"> ● Statistical representations ● Angles and Pie Charts ● Measures of central tendency and spread ● Interpreting statistical representations and measures ● Exploring statistical problems 	<p>Statistics</p> <p>Why Taught? A key skill for students to develop at KS3 is the ability to make an informed choice of what statistical analysis and representation to use for discrete, continuous and grouped data. Being able to construct representations and calculate values that indicate a measure of central tendency or of spread is important in order to represent and summarise data accurately. The use of real-life examples will play an important role in developing students’ understanding of the various ways that statistics can be used to represent data sets. It is also taught so that students understand the importance of having both a measure of central tendency and a measure of spread.</p> <p>Prior Learning From previous learning, students should be able to interpret and present discrete and continuous data using appropriate graphical methods, including bar charts and time graphs. They should also be able to solve comparison, sum and difference problems using information presented in bar charts, pictograms, tables and line graphs.</p> <p>Why Now?</p>	<p>Unit mini-tests</p> <p>Diagnostic and hinge questions</p> <p>Kerboodle mini quizzes on line</p> <p>Termly assessment covering all material from the start of the year.</p>

<p>Term 3:1</p>	<p>Perimeter, area and volume</p> <ul style="list-style-type: none"> ● Perimeter ● Area ● Surface area ● Volume <p>Polygons</p> <ul style="list-style-type: none"> ● Symmetry ● Angle properties ● Polygons ● Multi-step angle problems 	<p><u>Perimeter, area and volume</u></p> <p>Why Taught? It is important that students have a secure and deep understanding of perimeter, area and volume. Students should fully understand the concepts involved; appreciate how the various formulae are derived and connected; and reason mathematically to solve a wide range of problems, including those in new and unfamiliar situations.</p> <p>Prior Learning From prior learning, students should be able to find the area of rectilinear shapes by counting squares, calculate and compare the area of rectangles and estimate the area of irregular shapes. They should also be able to recognise that shapes with the same areas can have different perimeters and vice versa.</p> <p>Why Now?</p> <p><u>Polygons</u></p> <p>Why taught? Teaching and learning geometry offers an opportunity for students to think about relationships and structures, reason with them, prove results and distinguish proof from demonstration. In the context of angles, the geometry of intersecting lines and the connections and deductions that can be made from diagrams provide rich opportunities in which students can be encouraged to build logical, deductive arguments. Students develop a narrative, connecting and combining known facts in order to generate further mathematical truths.</p> <p>Prior Learning Students will have had opportunities to develop their spatial awareness and geometrical intuition in KS2 through situations involving angles and similar shapes. They will be aware of the geometrical facts and properties inherent in these situations. Students should be able to recognise angles where they meet at a point, are on a straight line, or are vertically opposite, and find missing angles. They should also be able to draw, compose, and decompose shapes according to given properties, including dimensions, angles and area, and solve related problems.</p> <p>Why Now?</p>	<p>Unit mini-tests</p> <p>Diagnostic and hinge questions</p> <p>Kerboodle mini quizzes on line</p>
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Term 3:2	Constructions <ul style="list-style-type: none"> • Constructions using circles • Constructions using rhombuses 	<u>Constructions</u> Why Taught? An important awareness is that the compass constructions of triangles of given lengths, a perpendicular bisector of a line segment, a perpendicular to a given line through a given point and an angle bisector are all based on the geometrical properties of key shapes like a circle, an isosceles triangle and a rhombus. A deep understanding and awareness of these geometrical properties will support students in gaining a conceptual overview of these constructions and guard against constructions being learnt mechanically as a set of procedural steps. Prior Learning Prior Learning involves being able to draw 2D shapes using given dimensions and angles as well as comparing and classifying geometric shapes based on their properties and sizes and finding unknown angles in any triangles, quadrilaterals, and regular polygons. Why Now?	Unit mini-tests Diagnostic and hinge questions Kerboodle mini quizzes on line Termly assessment covering all material from the start of the year.
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YEAR 9			
TERM	Topic sequence (What are you teaching?)	Topic sequence rationale (Why are you teaching this? How does it link to prior learning? Any notable links to St Edmund's curriculum mission)	Main method of assessment?
Term 1:1	Similarity and congruence <ul style="list-style-type: none"> • Notation and naming • Similarity • Congruency 	Similarity and congruence When exploring congruence, students should be aware of not only what is changing but also what is staying the same, and investigate possible changes which maintain congruence. Exploring similarity and congruence with a range of polygons and triangles should help students refine their understanding of these concepts and avoid confusion between them. In addition, exploring rotational symmetry offers students a further set of geometrical properties with which to describe and classify shapes. Prior Learning	Diagnostic questions Half termly assessment covering all material from the start of the year.

	<p>Pythagoras's theorem</p> <ul style="list-style-type: none"> ● Pythagorean triples ● Finding the length of a hypotenuse ● Finding length in right-angled triangles ● The converse of Pythagoras's theorem ● Solving problems with triangles 	<p>Why Now?</p> <p>Pythagoras's Theorem</p> <p>Why Taught? The relationship described by Pythagoras' theorem offers a context for students to reason deductively and use known facts to generate other mathematical truths. There are many ways to prove Pythagoras's theorem; sharing more than one approach helps students to appreciate the richness of mathematics and provides a context to consider mathematical elegance. Key ideas include being aware that there is a relationship between the lengths of the sides of a right-angled triangle and applying Pythagoras's theorem to solve problems in a range of contexts.</p> <p>Prior Learning</p> <p>Why Now?</p>	
<p>Term 1:2</p>	<p>Probability</p> <ul style="list-style-type: none"> ● Likelihood and randomness ● Probability: the chance of an outcome ● Combined events 	<p>Probability</p> <p>Why Taught? Students need to appreciate that predictions of likelihood do not predict individual events. Rather, experimental data will tend towards his theoretical value. As they start to quantify outcomes, students should be exposed to different ways to systematically organise and represent possible results, including lists, tables, grids and Venn diagrams. The use of precise language is key to working with probability. For example, students should understand the distinctions between an event and an outcome or between probability and possibility.</p> <p>Prior Learning Students should already understand that fractions are an example of a multiplicative relationship and apply this understanding to a range of contexts. They should also understand that ratios are an example of a multiplicative relationship and apply this understanding to a range of contexts.</p>	<p>Diagnostic questions</p> <p>Half termly assessment covering all material from the start of the year.</p>

		Why Now?	
Term 2:1	<p>Non-linear sequences</p> <ul style="list-style-type: none"> • Non-linear sequences • Geometric sequences • Other types of sequences <p>Expressions and formulae</p> <ul style="list-style-type: none"> • The Distributive Law • The Difference of two squares • Inverse operations • Changing the subject 	<p><u>Non-linear relationships</u></p> <p>Why Taught? This work extends students' knowledge of sequences through exploration of the mathematical structures not just by spotting the patterns that the structure creates. This learning has connections to other areas of algebra, particularly solving equations and graphs. From this work, students should consolidate, secure and deepen their understanding of sequences so they can progress to describing any term directly in relation to its position in the sequence.</p> <p>Prior Learning Before beginning non-linear relationships in Year 9, students should understand multiples, integer exponents and roots. They can use the conventions and vocabulary of algebra, including forming and interpreting algebraic expressions and equations.</p> <p>Why Now?</p> <p><u>Expressions and formulae</u></p> <p>Why Taught? At the heart of algebra and algebraic thinking is the expression of generality. Algebraic notation and techniques for its multiplication, including conventions governing its use, should naturally arise from exploring the structure of the number system and operations on number. Therefore, algebra is not considered a separate theme but is linked to an understanding of the structure of the number system and operating on numbers.</p> <p>Prior Learning From prior learning, students should use their knowledge of the order of operations to carry out calculations involving the four operations. They should also be able to use simple formulae, express missing number problems algebraically and find pairs of numbers that satisfy an equation with two unknowns.</p> <p>Why Now?</p>	<p>Diagnostic questions</p> <p>Half termly assessment covering all material from the start of the year.</p>

<p>Term 2:2</p>	<p>Trigonometry</p> <ul style="list-style-type: none"> ● A different kind of proportionality ● A different kind of measure ● Using trigonometric ratios to find sides ● Using trigonometric ratios to find angles 	<p>Trigonometry Why Taught? It is important for students to develop a secure understanding of trigonometry in right-angled triangles in 2D figures. By using existing knowledge and understanding of similarity, scale factor and multiplicative relationships, an awareness is built of how the length of sides and size of angles in right-angled triangles can be calculated and, hence, provide solutions to a wide range of practical problems. This sense of all right-angled triangles being a scaling of one of the two “unit” right-angled triangles within the unit circle emphasises the multiplicative relationship between triangles. Prior Learning From KS2, students should be able to solve problems involving similar shapes where the scale factor is known or can be found. From earlier studies in KS3, students should understand and be able to use similarity and congruence. Why Now?</p>	<p>Diagnostic questions</p> <p>Half termly assessment covering all material from the start of the year.</p>
<p>Term 3:1</p>	<p>Standard form</p> <ul style="list-style-type: none"> ● The Multiplicative identity and powers of ten ● Writing powers of ten in index notation ● Writing large numbers in standard form ● Writing small numbers in standard form 	<p>Standard form Why Taught? In Year 9, students will further develop their understanding of the different ways that numbers can be expressed and will become more proficient in changing from one form to another. This will develop their awareness that different representations of the same number can reveal something of its structure and so can be used to compare and order numbers with ease. When thinking about very large and very small numbers, working with standard form notation will enable students to further develop their understanding of multiplication and division by powers of ten. Prior Learning Students should be able to multiply and divide whole numbers and those involving decimals by 10, 100 and 1000 ; they can also recognise and use thousandths and relate them to tenths hundredths and decimal equivalents. Why Now?</p>	<p>Diagnostic questions</p> <p>Half termly assessment covering all material from the start of the year.</p>

<p>Term 3:2</p>	<p>Linear and non-linear graphs</p> <ul style="list-style-type: none"> ● Interpreting linear graphs ● Modelling real life situations graphically ● Interpreting non-linear graphs ● Direct and inverse proportion 	<p><u>Linear and non-linear graphs</u></p> <p>Why Taught? The KS3 programme of study states that students should be taught to “move freely between different numerical, algebraic, graphical and diagrammatic representations” and “to express relationships between variables algebraically and graphically”. Students should have experience of other functions and relationships (especially quadratic ones), be able to use graphs to solve problems in real-life contexts and understand how linear graphs can be used to find solutions to simultaneous equations.</p> <p>Prior Learning From KS2, students should describe positions on the full coordinate grid(all four quadrants). They should find pairs of numbers that satisfy an equation with two unknowns and enumerate possibilities of combinations of two variables. From earlier learning in KS3, students are able to rearrange the formula to change the subject and know that a set of coordinates, constructed according to a mathematical rule can be represented algebraically and graphically.</p> <p>Why Now?</p>	<p>Diagnostic questions</p> <p>Half termly assessment covering all material from the start of the year.</p>
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