



## Curriculum Overview 2025 2026

### Mathematics Department

Department	Mathematics
Head of Department	REC
Department Members	CKE, FKA, TSH, FAA, ABE, ENI, JON, CAH, LTA
Accommodation and Resources	Bottom floor of N block. We have many resources available to enhance our teaching including manipulatives, visualisers, fraction walls, 3D shapes which unfold to become nets, clinometers for practical trigonometry lessons, specialist paper resources (isometric paper, graph paper) and a selection of text books to cover the breadth of the curriculum.

<b>Curriculum Intent</b>	<p>Our aim is to provide learners with a deep conceptual understanding of mathematics. This will then enable them to articulate their learning confidently. A sequence of small steps is used to ensure that content is mastered before moving on. Students will then be able to apply their understanding to problem solving and develop the independence needed for further study.</p> <p>The habits of thinking mathematically are life-enriching. Because it is vital to be numerate to participate fully in society and democratic processes: our economy depends on a numerate workforce and a significant number of specialists in maths and science-related subjects. So, when we are thinking about the 'Intent' of our programme, it is all about finding ways to ensure that every young person, regardless of background, has a rich and meaningful mathematics education.</p>
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### Curriculum Implementation

#### Key Stage 3:

#### What my child will learn in Year 7

Year 7	Term 1	Term 2	Term 3	Term 4	Term 5	Term 6
Unit Title	<b>Number</b>	<b>Data &amp; Algebra</b>	<b>2D Geometry</b>	<b>Linear Graphs &amp; Transformations</b>	<b>Fractions, Decimals &amp; Percentages</b>	<b>Ratio and Proportion</b>
Previous knowledge recalled	<b>Number</b> -Times table -Long multiplication and division method Understanding negative numbers on a number line	<b>Data</b> Mean, mode, median, range. <b>Algebra</b> -Explain what are like terms Understanding inequality signs Mean, mode, median, range.	<b>2D Geometry</b> -Recognise 2D shapes -Understand angles are formed when two lines meet at a point -Recognise acute, obtuse and reflex angles Recognising 2D shapes Understand the difference between area and perimeter	<b>The Cartesian Plane</b> -Plotting and reading co-ordinates -Understand what is meant by midpoint -Understand what it means by reflection, rotation, translation and enlargement. Understand what it means by symmetry	<b>Fractions</b> -Understand what the numerator and denominator represent in terms of part and whole -know what is meant by improper fraction and mixed number -know place value in decimal and percentage is out of 100 Dividing by 10. 100, 1000	<b>Ratio and Proportion</b> -Reading recipes -Addition Multiplication -Division
New Knowledge	<b>Number</b>	<b>Data</b>	<b>2D Geometry</b>	<b>Linear Graphs</b>	<b>Fractions</b>	<b>Ratio and Proportion</b>



	<ul style="list-style-type: none"> <li>-Understanding analogue time.</li> <li>Indian and Mayan numbers.</li> <li>Representation of arrays in multiplication</li> <li>-Understand the difference between factors and multiples</li> <li>Using all four operations involving negative numbers</li> </ul>	<ul style="list-style-type: none"> <li>- Tally tables, pictograms, bar charts, two-way tables.</li> <li><b>Algebra</b></li> <li>-Collecting like terms by simplifying expression</li> <li>-Solving equations using one and two step/s</li> <li>-Representing and reading inequalities</li> <li>-Solving inequalities-Use of a compass</li> </ul>	<ul style="list-style-type: none"> <li>-Calculate angles in triangles</li> <li>-Quadrilaterals and polygons</li> <li>-Understand the difference between a quadrilateral and a polygon</li> <li>Calculating area and perimeter of 2D shapes</li> </ul>	<ul style="list-style-type: none"> <li>-Calculating the midpoint of a line on the cartesian plane</li> <li>-Plotting vertical and horizontal lines</li> <li>-Calculating area and perimeter of 2D shapes</li> <li><b>Transformations</b></li> <li>-Transforming shapes using reflection, rotation, translation and enlargement.</li> <li>Symmetrical shapes</li> <li>Rotational symmetry</li> <li>-Construct triangles with given sides</li> <li>-Use of a compass</li> </ul>	<ul style="list-style-type: none"> <li>Convert between FDP by understanding their relationship</li> <li>-Calculate fractions using all four operations</li> <li>Calculate fractions of amounts</li> <li>Multiply and divide decimals</li> <li>Calculate percentages of amounts. % increase and decrease.</li> </ul>	<ul style="list-style-type: none"> <li>-Simplify ratios</li> <li>-Share a quantity in a given ratio</li> <li>-Using multiplication/division to calculate accurate proportion of ingredients in a recipe</li> </ul>
Key Knowledge Assessment	<p><b>Mid-term knowledge check</b></p> <ul style="list-style-type: none"> <li>Multiplying</li> <li>Dividing</li> <li>Arrays</li> </ul> <p><b>End of term assessment</b></p> <ul style="list-style-type: none"> <li>Multiplying</li> <li>Dividing</li> <li>Arrays</li> <li>Factors</li> <li>Multiples</li> </ul>	<p><b>Mid-term knowledge check</b></p> <ul style="list-style-type: none"> <li>Understanding and interpreting data</li> </ul> <p><b>End of term assessments</b></p> <ul style="list-style-type: none"> <li>Data</li> <li>Solving equations</li> <li>Inequalities</li> </ul>	<p><b>Mid-term knowledge check</b></p> <ul style="list-style-type: none"> <li>Angles in triangles</li> <li>Angles in polygons</li> </ul> <p><b>End of term assessments</b></p> <ul style="list-style-type: none"> <li>Angles in triangles</li> <li>Angles in polygons</li> <li>Area and perimeter of 2D shapes including compound shapes</li> </ul>	<p><b>Mid-term knowledge check</b></p> <ul style="list-style-type: none"> <li>Plotting coordinates</li> <li>Identifying equations of lines</li> </ul> <p><b>End of term assessments</b></p> <ul style="list-style-type: none"> <li>Plotting coordinates</li> <li>Identifying equations of lines</li> <li>Transformations</li> </ul>	<p><b>Mid-term knowledge check</b></p> <ul style="list-style-type: none"> <li>Adding fractions</li> <li>Subtracting fractions</li> <li>Multiplying fractions</li> <li>Dividing fractions</li> </ul> <p><b>End of term assessments</b></p> <ul style="list-style-type: none"> <li>Adding fractions</li> <li>Subtracting fractions</li> <li>Multiplying fractions</li> <li>Dividing fractions</li> <li>Calculating with mixed numbers</li> <li>Converting between fractions, decimals and percentages</li> <li>Fractions of amounts</li> </ul>	<p><b>Mid-term knowledge check</b></p> <ul style="list-style-type: none"> <li>Simplifying ratio</li> <li>Sharing ratio</li> </ul> <p><b>End of term assessments</b></p> <ul style="list-style-type: none"> <li>Simplifying ratio</li> <li>Sharing ratio</li> <li>Proportion</li> <li>Recipes</li> </ul>
Links to literacy and numeracy	<ul style="list-style-type: none"> <li>Commutative</li> <li>-Product</li> <li>-Quotient</li> <li>-Divisor</li> <li>-Divisible</li> <li>-Prime</li> <li>-Multiples</li> <li>-Factors</li> <li>-Highest common factor</li> <li>-Lowest common multiple</li> </ul> <p><b>Reading:</b> Solve problems relating to real life examples</p>	<ul style="list-style-type: none"> <li>Communicate findings in data using reasoning</li> <li>balancing method of solving equations</li> </ul> <p><b>Reading:</b> Read worded problems to be able to form equations</p>	<ul style="list-style-type: none"> <li>Use of protractor to measure accurately</li> <li>Division,</li> <li>Use proof in real life contexts using area and perimeter</li> </ul> <p><b>Speaking:</b> Explain in detail how angles have been calculated and triangles have been constructed</p>	<ul style="list-style-type: none"> <li>Movements on the cartesian plane</li> <li>rotational symmetry, reflectional symmetry</li> </ul> <p><b>Extended writing:</b> Write in detail the x and y lines and the transformations of shapes</p>	<ul style="list-style-type: none"> <li>Equivalent fraction, use of all four operations</li> </ul> <p><b>Speaking:</b> Explain the processes used to calculate fractions and converting between fractions, decimals and percentages</p>	<ul style="list-style-type: none"> <li>Multiplication and division, scale factors</li> </ul> <p><b>Extended writing:</b> Write comparisons and write down findings after calculating ratio and proportion</p>



	Times tables					
Extra-Curricular opportunities	<p>Maths clinics every lunch time in N1 to support students with curricular or extracurricular maths. Exploring the possibility of beginning a Financial maths club.</p> <p>Exploring the interest in beginning a maths games club for KS3 students</p> <p>Reading: How not to be wrong- The hidden maths of everyday life, Jordan Ellenberg</p> <p>Murderous Maths to the Power of Ten</p>					
Links to careers/aspirations	<p>Computer security, Jeweller, air traffic controller, dietician, encryption, cryptography, CAD engineer, construction worker, plumber, graphic designer, banking, finance, baker, chef.</p>					
Links to our Fulston FAMILY values	<p><b>Fortitude</b>- Having the resilience and determination to keep trying when we are finding things tough <b>Ambition</b>- Striving for excellence and being aware of our gaps in understanding</p> <p><b>Mindful</b>- Developing our own metacognition so that we become independent life-long learners <b>Integrity</b> – Being diligent in our studies so that we are in control of our own journey</p> <p><b>Leadership</b>- Take the lead in class so that we set a good example to our peers</p> <p><b>Young Citizens</b>- Be aware of how our mathematical education fits in with the value we can add to our community.</p>					



## What my child will learn in Year 8

Year 8	Term 1	Term 2	Term 3	Term 4	Term 5	Term 6
Unit Title	<b>Equations and Inequalities</b>	<b>Graphical Representations</b>	<b>Proportional Reasoning</b>	<b>Data</b>	<b>Angles</b>	<b>Area, volume and surface area</b>
Previous knowledge recalled	<b>Equations and inequalities</b> -Understand algebraic vocabulary - Be able to carry out all four operations	<b>Graphical representations</b> -Understand how to plot co-ordinates -Know what is the x axis and y axis -Know equations of lines passing through x and y axis	<b>Ratio and proportional reasoning</b> -Understand that numbers in a ratio represents parts and together they make the whole -Times table -Use of all four operations	<b>Averages</b> -Ability to use all four operations Understanding of rounding <b>Displaying data</b> -Able to read and use a protractor	<b>Angles</b> -Properties of shapes -Understand parallel lines and perpendicular lines -Name 2D shapes	<b>Area, volume and surface area</b> -Ability to recognise 3D objects -Understand what is meant by edges, faces and vertices -Calculate area of 2D shapes -Calculate area of compound shapes
New Knowledge	<b>Equations and inequalities</b> -Solve equations and inequalities with variables on one side and both sides Form and solve equations in 2D shapes	<b>Graphical representations</b> -Finding the gradient of a line -Identifying the intercept -Completing a table of values and plotting linear graphs -Naming a line in the form $y=mx+c$ -Properties of parallel and perpendicular lines	<b>Ratio and proportional reasoning</b> -Simplifying ratios -Writing ratios in the form 1:n -Sharing a quantity with a given ratio -Calculating ratios in reverse Understanding proportional relationships -Use of recipes, best buys, exchange rates	<b>Averages</b> -Calculate the averages of a set of data <b>Displaying data</b> -Be able to represent data in the form of bar charts, two-way tables, pictograms, pie charts, stem and leaf diagrams -Interpret data representation	<b>Angles</b> -Calculate interior and exterior angles in quadrilaterals and polygons -Use the formula $(n-2) \times 180$ to calculate total angles in any polygon -Recognise angles in parallel lines	<b>Area, volume and surface area</b> Understanding nets of 3D shapes -Calculate area and volume of 3D shapes -Calculate surface area of triangular prisms and cuboids
Key Knowledge Assessment	<b>Mid-term knowledge check</b> Solving equations Solving inequalities <b>End of term assessments</b> Solving equations Solving inequalities Forming equations Equations and 2D shapes	<b>Mid-term knowledge check</b> Gradient of lines Intercepts of lines <b>End of term assessments</b> Gradient of lines Intercepts of lines Constructing a straight line graph Parallel lines Perpendicular lines	<b>Mid-term knowledge check</b> Simplifying ratio Simplifying 1:n Sharing ratio <b>End of term assessments</b> Simplifying ratio Simplifying 1:n Sharing ratio Reverse ratio Best buys Exchange rates	<b>Mid-term knowledge check</b> Averages Mean Median Mode Range <b>End of term assessments</b> Bar charts Two-way tables Pictograms Pie Charts Stem and Leaf	<b>Mid-term knowledge check</b> Interior angles Exterior angles <b>End of term assessments</b> Interior angles Exterior angles Angles in parallel lines	<b>Mid-term knowledge check</b> Nets Surface area <b>End of term assessments</b> Nets Surface area Volume
Links to literacy and numeracy	Use inequality symbols, use of BIDMAS, use of indices, expand brackets  <b>Verbal:</b> able to explain the processes used to solve equations and inequalities	Using the four operations, drawing graphs, use of a ruler, drawing lines  <b>Reading:</b> able to read questions and answer them mathematically	Use of scale factors, times table, use of and understanding division  <b>Reading and writing:</b> understanding the worded problems and writing a conclusion after a	Calculate averages and range, use of all four operations, use of a protractor and a ruler  <b>Reading and writing:</b> ability to read and appropriately represent data, write findings	Recall properties of triangles, name angles  <b>Writing:</b> able to write mathematical reasons for calculating specific angles	Multiplication, identifying 2D faces of 3D objects  <b>Reading:</b> understand the text to be able to use the correct formula for calculating area



			series of calculations	after calculating averages, ability to write comparison of data		and volume of 3D shapes
Extra-Curricular opportunities	<p>Maths clinics every lunch time in N1 to support students with curricular or extracurricular maths. Exploring the possibility of beginning a Financial maths club.</p> <p>Exploring the interest in beginning a maths games club for KS3 students</p> <p>Reading: How not to be wrong- The hidden maths of everyday life, Jordan Ellenberg</p> <p>Murderous Maths to the Power of Ten</p>					
Links to careers/aspirations	<p>Computer programmer, architect, builder, real estate, insurance underwriters, production engineers, stock analyst, investment broker, painter, carpet layer, tiler</p>					
Links to our Fulston FAMILY values	<p><b>Fortitude</b>- Having the resilience and determination to keep trying when we are finding things tough <b>Ambition</b>- Striving for excellence and being aware of our gaps in understanding</p> <p><b>Mindful</b>- Developing our own metacognition so that we become independent life-long learners <b>Integrity</b> – Being diligent in our studies so that we are in control of our own journey</p> <p><b>Leadership</b>- Take the lead in class so that we set a good example to our peers</p> <p><b>Young Citizens</b>- Be aware of how our mathematical education fits in with the value we can add to our community.</p>					



## What my child will learn in Year 9

Year 9	Term 1	Term 2	Term 3	Term 4	Term 5	Term 6
Unit Title	<b>Core Number Statistics</b>	<b>Developing Algebraic Thinking</b>	<b>Reasoning with numbers Representing data</b>	<b>Ratio and Proportion Sequences</b>	<b>Probability Sets</b>	<b>Shape Right angles triangles</b>
Previous knowledge recalled	<p><b>Fractions and decimals</b></p> <ul style="list-style-type: none"> <li>-Multiply fractions</li> <li>-Add and subtract decimals</li> <li>-Addition and subtraction of integers</li> </ul> <p><b>Statistics</b></p> <p>Types of data</p>	<p><b>Equations</b></p> <ul style="list-style-type: none"> <li>-Use all four operations</li> <li>-Simplify expressions</li> <li>-Calculate using negative numbers</li> </ul>	<p><b>Indices/Surds</b></p> <ul style="list-style-type: none"> <li>-Understand square numbers and square roots</li> </ul> <p><b>Standard Form</b></p> <ul style="list-style-type: none"> <li>-Calculate with base 10</li> </ul> <p><b>Representing data</b></p> <p>represent data in the form of bar charts, two-way tables, pictograms, pie charts, stem and leaf diagrams</p> <ul style="list-style-type: none"> <li>-Interpret data representation</li> </ul>	<p><b>Ratio and proportion</b></p> <ul style="list-style-type: none"> <li>-Understanding of highest common factor</li> <li>-Know the difference between fractions and ratio</li> </ul> <p><b>Sequences</b></p> <ul style="list-style-type: none"> <li>-Recognise number patterns</li> <li>-multiplication</li> </ul>	<p><b>Sets</b></p> <ul style="list-style-type: none"> <li>-Probability</li> <li>-Setting up a venn diagram</li> </ul>	<p><b>Shape</b></p> <ul style="list-style-type: none"> <li>-Recognise 2D and 3D shapes</li> <li>-Multiplication</li> </ul> <p><b>Right angled triangles</b></p> <ul style="list-style-type: none"> <li>-Understand what it means to square a number and square root a number</li> </ul>
New Knowledge	<p><b>Number</b></p> <ul style="list-style-type: none"> <li>Multiplication methods with decimals</li> <li>-Division methods with decimals</li> <li>-Prime Factor Decomposition</li> <li>-HCF/LCM</li> </ul> <p><b>Statistics</b></p> <ul style="list-style-type: none"> <li>-Creating a hypothesis</li> <li>-Recognising population and sampling</li> <li>-Creating valid data collection sheets</li> </ul>	<p><b>Equations</b></p> <ul style="list-style-type: none"> <li>-Identify the difference between an identity, equation, expression, formula</li> <li>-Simplifying expressions</li> </ul> <p>Solving simple equations</p> <ul style="list-style-type: none"> <li>-Solve equations with variables on both sides</li> <li>-Expand and factorise single brackets</li> <li>-Expand and factorise double brackets</li> <li>-Represent inequalities on a number line</li> <li>-Solve inequalities</li> <li>-Solve simultaneous equations algebraically</li> </ul>	<p><b>Indices</b></p> <ul style="list-style-type: none"> <li>-Understand the rules of indices</li> <li>-Calculate using fractional and negative indices</li> <li>-Simplify surds</li> <li>-Use of surd notations</li> </ul> <p><b>Surds</b></p> <ul style="list-style-type: none"> <li>-Recognise not all numbers are rational</li> <li>-Understand how to calculate with surds</li> </ul> <p><b>Standard form</b></p> <ul style="list-style-type: none"> <li>-Convert between ordinary numbers and standard form</li> <li>-Multiply and divide standard form</li> </ul> <p><b>Representing data</b></p> <ul style="list-style-type: none"> <li>-Analyse data in a variety of tables,</li> </ul>	<p><b>Ratio and proportion</b></p> <ul style="list-style-type: none"> <li>-Simplify ratios</li> <li>-Share a quantity with a given ratio</li> <li>-Reverse ratios</li> <li>-Calculate proportion in recipes, best buys, exchange rates</li> </ul> <p><b>Sequences</b></p> <ul style="list-style-type: none"> <li>-Recognise position to term rules</li> <li>-Recognise term to term rules</li> <li>-Identify the nth term of a sequence</li> <li>-Calculate sequences from the nth term</li> </ul>	<p><b>Probability</b></p> <p>Understanding of theoretical and experimental probability</p> <ul style="list-style-type: none"> <li>-Drawing and interpreting sample space diagrams, two-way tables, frequency trees, tree diagrams</li> <li>-Calculate probabilities</li> <li>-Calculate relative risk</li> </ul> <p><b>Sets</b></p> <ul style="list-style-type: none"> <li>-Set notation</li> <li>-Venn diagrams</li> <li>-Probability from sets</li> </ul>	<p><b>Shape</b></p> <ul style="list-style-type: none"> <li>-Distinguish the difference between area and perimeter</li> <li>-Calculate the volume of prisms</li> <li>-Calculate the surface area of prisms</li> <li>-Use area and perimeter in context</li> </ul> <p><b>Right angled triangles</b></p> <ul style="list-style-type: none"> <li>-Label a right-angle triangle in terms of a, b, c</li> <li>-Calculate the length of a side and an angle size using Pythagoras' Theorem</li> <li>-Recognise the adjacent, opposite and hypotenuse lengths of right angled triangles</li> </ul>



			graphs and charts -Presents data on population pyramids and choropleth maps -compare data form various graphs and charts including cumulative frequency, box plots and histograms -Justify appropriate representations Determine skews in averages and quartiles			-Use trigonometry ratios to calculate missing lengths and angles in right angled triangles
Key Knowledge Assessment	<b>Weekly knowledge quiz</b>  <b>End of Term assessment</b> Multiplication Division Fractions Collecting data	<b>Weekly knowledge quiz</b>  <b>End of Term assessment</b> Simplifying expressions Forming equations Solving equations Solving inequalities Solving simultaneous equations	<b>Weekly knowledge quiz</b>  <b>End of Term assessment</b> Indices Surds Standard Form Representing data	<b>Weekly knowledge quiz</b>  <b>End of Term assessment</b> Simplifying ratio Sharing ratio Reverse ratio Recipes Best buys Sequences nth term	<b>End of year assessment</b> Number skills Algebra skills Data Ratio and proportion	<b>Weekly knowledge quiz</b>  <b>End of Term assessment</b> Area Perimeter Volume Surface area Pythagoras' Theorem Trigonometry
Links to literacy and numeracy	Add and multiply fractions Understanding fractions, decimals and percentages  <b>Extended writing:</b> writing conclusions Writing comparisons	Function machines Substitution  <b>Reading:</b> Interpreting linear graphs Reading problem solving questions to apply algebraic skills	Rearrange formula Recall angles Square numbers Square root numbers  <b>Oral:</b> Communicate detailed explanations of why an angle is the size it is using correct terminology	Four operations Basic understanding of fractions being parts of a whole Find a scale factor  <b>Reading and writing:</b> Problem solve with ratio and proportion Write conclusions based on mathematical calculations	Use all four operations Use a ruler  <b>Reading:</b> Solve problems using mathematical calculations	Square roots Square numbers Multiply by 10 Divide by 100 <b>Reading and writing:</b> Solve problems in real life contexts Write conclusion after mathematical calculations
Extra-Curricular opportunities	Maths clinics every lunch time in N1 to support students with curricular or extra-curricular maths. Exploring the possibility of beginning a Financial maths club. Exploring the interest in beginning a maths games club for KS3 students Reading: How not to be wrong- The hidden maths of everyday life, Jordan Ellenberg Murderous Maths to the Power of Ten					
Links to careers/ aspirations	Government employment, financial engineering, accountants, auditors, aviation, electricians, interior decorator, hair stylist, audio engineers, agriculture, astronomy, property developer					



Links to our Fulston FAMILY values	<p><b>Fortitude</b>- Having the resilience and determination to keep trying when we are finding things tough</p> <p><b>Ambition</b>- Striving for excellence and being aware of our gaps in understanding</p> <p><b>Mindful</b>- Developing our own metacognition so that we become independent life-long learners</p> <p><b>Integrity</b> – Being diligent in our studies so that we are in control of our own journey</p> <p><b>Leadership</b>- Take the lead in class so that we set a good example to our peers</p> <p><b>Young Citizens</b>- Be aware of how our mathematical education fits in with the value we can add to our community.</p>
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<b>Extended Learning Opportunities for Key Stage 3</b>	Students are encouraged to continue with Sparx Maths XP Boost to enhance their learning.
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## Key Stage 4:

### What my child will learn in Year 10

Year 10	Term 1	Term 2	Term 3	Term 4	Term 5	Term 6
Unit Title	<b>Core &amp; Higher Algebra Skills</b>	<b>Fractions, decimals, percentages</b> <b>Multiplicative reasoning</b>  <b>Compound Measures(H)</b> <b>Bounds(H)</b> <b>Iteration(H)</b> <b>Similar Shapes(H)</b>	<b>Averages and statistical skills and diagrams.</b>  <b>Constructions , loci and bearings</b>	<b>Core and Higher Geometry</b>	<b>Statistics and Probability</b>	<b>Transformation</b>  <b>Vectors</b>  <b>Equation of a circle (H)</b>
Previous knowledge recalled	<b>Algebra</b> -Basic rules of algebra - Simplification - Manipulation - Four operations involving algebra	<b>Fractions, decimals, percentages</b> -Convert between fractions, decimals and percentages -Find fractions of amounts -Find percentages of amounts -Increase and decrease amounts by a percentage -Simple interest  <b>Multiplicative reasoning</b> -Interpret scales -Find percentages of amounts -rearrange equations -know speed, distance, time and mass, density, volume  <b>Compound Measures</b> -basic units of measure -squaring and square rooting  <b>Iteration</b> -using a calculator	<b>Averages</b> -Ordering integers, fractions, decimals & percentages -Averages  <b>Statistical skills and diagrams</b> -Be able to represent data in the form of bar charts, two-way tables, pictograms, pie charts, stem and leaf diagrams -Interpret data representation  <b>Bearings</b> -Angle facts -Measuring angles	<b>2D &amp; 3D Shapes</b> -Properties of 2D shapes -Properties of 3D shapes -Nets of shapes -Area of shapes -Perimeter of shapes -Volume of shapes -Surface area of simple shape  <b>Higher Geometry</b> -Understanding of basic trigonometric ratios -Application of trig and Pythag in real-life settings	<b>Statistics</b> -Types of data -Collection methods -Find averages from frequency tables -Estimate the mean -Find averages from charts and graphs -recognise advantages and disadvantages from averages -Reverse mean  <b>Probability</b> -Probability scale -Language of probability -Regular examples eg dice, playing cards	<b>.Transformations</b> -Drawing and reading a Cartesian Graph -Single transformations -Mirror lines -Coordinates  <b>Vectors</b> -the distinction between horizontal movement,x, and vertical movement.y.  <b>Equation of a circle</b> - Reading cartesian graphs - manipulating algebra -Core number skills



<p>New Knowledge</p>	<p><b>Core Skills</b></p> <ul style="list-style-type: none"> <li>-Expanding single brackets</li> <li>-Expanding double bracket</li> <li>-Solving equations</li> <li>-Factorising</li> <li>-Changing the subject</li> <li>-Solving equations</li> <li>-Algebraic fractions(H)</li> <li>-Solving complex equations(H)</li> <li>-Algebraic Proof(H)</li> <li>-Functions(H)</li> </ul>	<p><b>Fractions, decimals, percentages</b></p> <ul style="list-style-type: none"> <li>-Increase and decrease amounts using percentage multipliers</li> <li>-Calculate using compound interest and depreciation</li> <li>-Calculate reverse percentages</li> <li>-Calculate percentage change</li> <li>-Apply the four operations to fractions, decimals and percentages</li> <li>-Calculate with roots and indices</li> <li>-Calculate with standard form</li> </ul> <p><b>Multiplicative reasoning</b></p> <ul style="list-style-type: none"> <li>-Convert between metric units</li> <li>-calculate speed, distance, time and mass, density, volume</li> <li>-Calculate exchange rates, best buys and rates of pay</li> <li>-Calculate growth and decay problems</li> </ul> <p><b>Compound Measure</b></p> <ul style="list-style-type: none"> <li>-moving freely between different units of weight, speed etc</li> </ul> <p><b>Bounds</b></p> <ul style="list-style-type: none"> <li>-degrees of accuracy</li> <li>-rounding to stated levels</li> <li>-tackling problems involving bounds</li> <li>-answering bounds questions</li> </ul>	<p><b>Averages</b></p> <ul style="list-style-type: none"> <li>-Find averages from frequency tables</li> <li>-Estimate the mean</li> <li>-Find averages from charts and graphs</li> <li>-recognise advantages and disadvantages from averages</li> <li>-Reverse mean</li> </ul> <p><b>Statistical skills and diagrams</b></p> <ul style="list-style-type: none"> <li>-Recognise and collect various types of data</li> <li>-understand why a sample may not be representative of a whole population</li> <li>-Understand sample and population</li> <li>-Design and use data-collection sheets</li> <li>-Put data into a correct table or chart</li> <li>-Recognise suitable graphs to represent data (bar chart, pie chart, pictogram, Stem and Leaf</li> <li>-Draw and interpret scatter graphs</li> <li>-Know the appropriate use for cumulative frequency diagrams(H)</li> <li>-Find the medians and quartiles from cumulative frequency diagrams(H)</li> <li>-Produce and interpret box plots(H)</li> <li>-Construct and read information from histograms(H)</li> </ul>	<p><b>2D &amp; 3D Shapes</b></p> <ul style="list-style-type: none"> <li>-Link between face, edges and vertices</li> <li>-Surface area of complex shapes</li> <li>-Volume of complex shapes inc circles, cylinders, cones and spheres</li> <li>-Area and Perimeter of compound shapes</li> <li>-Volume and surface area of compound shapes</li> </ul> <p><b>Higher Geometry</b></p> <ul style="list-style-type: none"> <li>-Sine Rule</li> <li>-Cosine Rule</li> <li>-Exact trig values</li> <li>-3D trig and Pythag</li> <li>-Area of any triangle</li> <li>- Exposure to top grade questions involving the above skills</li> </ul>	<p><b>Statistics</b></p> <ul style="list-style-type: none"> <li>-Using real-life data to analyse statistically</li> <li>-Using statistical language and measures to make judgements and observations</li> </ul> <p><b>Probability</b></p> <ul style="list-style-type: none"> <li>-Calculating probability</li> <li>-Sample space diagrams</li> <li>-Two-Way tables</li> <li>-Mutually exclusive events</li> <li>-Exhaustive Events</li> <li>-Venn Diagrams</li> <li>-Tree Diagrams</li> <li>-Conditional probability (H)</li> </ul>	<p><b>Transformations</b></p> <ul style="list-style-type: none"> <li>-Combined Transformations</li> <li>-Fractional and Negative enlargements</li> </ul> <p><b>Vectors</b></p> <ul style="list-style-type: none"> <li>-Column Vector notation</li> <li>-Manipulation of Vectors</li> <li>-Resultant Vectors</li> <li>-Parallel and co-linear Vectors</li> <li>-Vector Proofs</li> </ul> <p><b>Equation of a circle</b></p> <ul style="list-style-type: none"> <li>-understanding intersections</li> <li>-understanding various parts of an equation of a circle</li> <li>- deciphering multi step problems</li> <li>-applying Pythagoras' theorem</li> </ul>
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		<p><i>based on results from calculations.</i></p> <p><b>Iteration</b></p> <p><i>-using a calculator effectively</i></p> <p><i>-Decoding a question to produce a response.</i></p> <p><i>-Maths in a real life context.</i></p>	<p><b>Construction, loci and bearings</b></p> <p>-Use a pair of compasses and a protractor to construct SSS,SAS,ASA,RHS triangles</p> <p>-Find and describe regions satisfying a loci</p> <p>-Use 3 figure bearings to specify direction</p> <p>-Use accurate drawing to solve bearings problems</p>			
Key Knowledge Assessment	<p><b>Weekly knowledge quiz</b></p> <p><b>End of term assessments</b></p> <p>Core algebra skills</p> <p>Higher algebra skills (H)</p>	<p><b>Weekly knowledge quiz</b></p> <p><b>End of term assessments</b></p> <p>Fraction, Decimals and Percentages</p> <p>Bound</p> <p>Compound measures</p> <p>Similar shapes</p> <p>Iteration</p>	<p><b>Weekly knowledge quiz</b></p> <p><b>End of term assessments</b></p> <p>Averages</p> <p>Estimated mean</p> <p>Statistical diagrams</p> <p>Constructions</p> <p>Loci</p> <p>Bearings</p>	<p><b>Weekly knowledge quiz</b></p> <p><b>End of term assessments</b></p> <p>2D Shapes</p> <p>3D Shapes</p> <p>Volume</p> <p>Mass</p> <p>Density</p> <p>Advanced Trigonometry</p>	<p><b>Weekly knowledge quiz</b></p> <p><b>PPE</b></p> <p>GCSE Exam paper</p> <p><b>End of term assessments</b></p> <p>Statistics overview</p> <p>Probability extended</p>	<p><b>Weekly knowledge quiz</b></p> <p><b>End of term assessments</b></p> <p>Formative assessment in class.</p>
Links to literacy and numeracy	<p><b>Literacy:</b></p> <p>Reading- Ability to extract and process what the question is asking the learner to undertake. Real life situations.</p> <p><b>Numeracy:</b></p> <p>Numerical dexterity.</p>	<p><b>Literacy:</b></p> <p>Reading- Read worded problems to be able to form equations.</p> <p><b>Numeracy:</b></p> <p>Balancing method of solving equations</p>	<p><b>Literacy:</b></p> <p>Processing- Deciphering construction, loci and bearings problems to solve.</p> <p>Use critical statistical analysis to give effective responses.</p> <p>Geometrical reasoning.</p> <p><b>Numeracy:</b></p> <p>Properties of shapes</p> <p>Justifying answers</p>	<p><b>Literacy:</b></p> <p>Interpretation- Deciphering geometric problems to perform necessary steps.</p> <p><b>Numeracy:</b></p> <p>Simple arithmetic applied to advanced techniques</p>	<p><b>Literacy:</b></p> <p>Processing- Interpreting mathematical situations and displaying them graphically.</p> <p><b>Numeracy:</b></p> <p>Substitution into formulae to find unknowns</p>	<p><b>Literacy:</b></p> <p>Discussion- Using statistical measures to draw and present conclusions in a logical manner.</p> <p><b>Numeracy:</b></p> <p>Arithmetic Logic</p>
Extra-Curricular opportunities	<p>Higher level problem solving lunch, exploring links with computing to begin coding club.</p> <p>Reading: How not to be wrong- The hidden maths of everyday life, Jordan Ellenberg</p> <p>Murderous Maths to the Power of Ten</p>					
Links to careers/ aspirations	<p>Finance, Stock Market, Aerospace Engineer, Airline Pilot, Architect, Marketing, Product Design, Video Game Designer, Computer Coder, App Designer, Professional chief, Mathematicians, Bakers, Real estate workers</p>					



<p>Links to our Fulston FAMILY values</p>	<p><b>Fortitude</b>- Having the resilience and determination to keep trying when we are finding it tough <b>Ambition</b>- Striving for excellence and being aware of our gaps in understanding  <b>Mindful</b>- Developing our own metacognition so that we become independent life-long learners <b>Integrity</b> – Being diligent in our studies so that we are in control of our own journey  <b>Leadership</b>- Take the lead in class so that we set a good example to our peers  <b>Young Citizens</b>- Be aware of how our mathematical education fits in with the value we can add to our community.</p>
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## What my child will learn in Year 11

Year 11	Term 1	Term 2	Term 3	Term 4	Term 5	Term 6
Unit Title	<b>Indices Standard Form Surds Transformations</b>	<b>Constructions and geometry Proof</b>	<b>Linear Functions Statistical Charts and techniques</b>	<b>GCSE Preparation</b>	<b>GCSE Preparation</b>	
Previous knowledge recalled	<b>Indices</b> -Powers of 10, 100, 1000 -Squares and cubes -Multiplying and dividing decimals -Square roots -Cube roots <b>Standard Form</b> -Powers of 10, 100, 1000 -Decimal places -Multiplying -Dividing <b>Surds</b> -Square roots -Factors -Prime numbers -Factor pairs -Manipulation of fractions <b>Transformations</b> -Mirror lines -Angles -Coordinates -Scale factors -Labelling axis	<b>Constructions &amp; Geometry</b> -Identification of shapes -Properties of shapes -Angles in shapes -Area -Perimeter -Use of compass -Measuring angles with protractor -Using a ruler -Classification of triangles <b>Proof</b> -Algebraic manipulation -Problem solving skills	<b>Linear Functions</b> -Function machines -Drawing Cartesian graphs -Plotting coordinates -Equation of a line (elements) <b>Statistical Charts and Techniques</b> -Drawing axis -Reading from graphs and charts -Addition and subtraction -Definitions of averages -Plotting coordinates	<b>Tailored revision of topics based on Assessment gap analysis.</b>	<b>Tailored revision of topics based on Assessment gap analysis.</b>	
New Knowledge	<b>Indices</b> -Roots as indices -Negative indices -Fractional indices -Laws of indices <b>Standard Form</b> -Converting into standard form -Converting into ordinary numbers -Calculating in standard form <b>Surds</b> -Simplifying surds -Calculating with surds -rationalising denominators <b>Transformations</b>	<b>Constructions &amp; Geometry</b> -Bisecting an angle -Bisecting a line -Dissecting a line at a given point -Constructing a triangle given certain conditions -Constructing a locus of points -Calculating area of less common shapes -Calculating perimeter of less common shapes -Working with compound shapes	<b>Linear Functions</b> -Plotting lines from their functions -Identifying linear, quadratic, cubic graphs -Identifying trigonometric graphs -Identifying points of interest from graphs and/or functions <b>Statistical Charts and Techniques</b> -Analysing bar charts -Analysing pictograms -Analysing pie charts			



	<ul style="list-style-type: none"> <li>-Performing multiple transformations</li> <li>-Describing transformations</li> <li>-Enlargements</li> <li>-Fully describing multiple transformations</li> </ul>	<ul style="list-style-type: none"> <li>-Solving real-life geometry problems</li> <li><b>Proof</b></li> <li>-Use of algebra to prove</li> <li>-Difference between demonstration and proof</li> </ul>	<ul style="list-style-type: none"> <li>-Working with grouped data</li> <li>-Constructing frequency polygons</li> <li>-Constructing &amp; reading boxplots</li> <li>-Comparing data sets displayed in various formats</li> <li>-Constructing and reading cumulative frequency graphs</li> <li>-Capture recapture</li> <li>-Constructing and reading histograms</li> <li>-Constructing and reading time series graphs</li> <li>-Constructing and using scatter graphs.</li> </ul>			
Key Knowledge Assessment	<p><b>Mid-term assessment</b></p> <p>Indices</p> <p>Standard form</p> <p><b>End of term assessments</b></p> <p>Indices</p> <p>Standard form</p> <p>Transformation</p>	<p><b>November PPE</b></p> <p>Past GCSE papers</p> <p>Paper 1- Non calculator</p> <p>Paper 2</p> <p>Calculator</p> <p>Paper 3</p> <p>Calculator</p>	<p><b>End of term Assessment</b></p> <p>Equations of lines</p> <p>Reading graphs</p> <p>Grouped data</p>	<p><b>March PPE</b></p> <p>Past GCSE papers</p> <p>Paper 1- Non calculator</p> <p>Paper 2</p> <p>Calculator</p> <p>Paper 3</p> <p>Calculator</p>	<p><b>Final Exams</b></p>	
Links to literacy and numeracy	<p><b>Literacy:</b></p> <p>Reading and processing the question to ensure delivery of the correct method and solution.</p> <p><b>Numeracy:</b></p> <p>Continual reinforcement of the four operations.</p>	<p><b>Literacy:</b></p> <p>Prepare to identify the language given in order to perform the correct construction. Familiarisation of names and properties of shapes.</p> <p><b>Numeracy:</b></p> <p>Differentiating between the various geometric operations eg Perimeter and area.</p>	<p><b>Literacy:</b></p> <p>Understand real world statistical data and apply common sense to check answers. Comparisons and conclusions.</p> <p><b>Numeracy:</b></p> <p>Understanding the effect of changing elements of functions. Using raw data and percentages including percentage change.</p>			
Extra-Curricular opportunities	<p>Maths enrichment workshops, Lunch time higher level problem solving group, exploring a link with computing department for coding club.</p>					
Links to careers/aspirations	<p>Finance, Stock Market, Aerospace Engineer, Airline Pilot, Architect, Marketing, Product Design, Video Game Designer, Computer Coder, App Designer, Teaching, Mathematicians, Bakers, Property sales and development.</p>					
Links to our Fulston FAMILY values	<p><b>Fortitude</b>- Having the resilience and determination to keep trying when we are finding it tough <b>Ambition</b>- Striving for excellence and being aware of our gaps in understanding</p>					



	<p><b>Mindful</b>- Developing our own metacognition so that we become independent life-long learners <b>Integrity</b> – Being diligent in our studies so that we are in control of our own journey</p> <p><b>Leadership</b>- Take the lead in class so that we set a good example to our peers</p> <p><b>Young Citizens</b>- Be aware of how our mathematical education fits in with the value we can add to our community.</p>
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<b>Extended Learning Opportunities for Key Stage 4</b>	UKMT participation in Year 10. Work experience in a relevant field in Year 10. After school workshops throughout Year 11. Maths clinics available every lunch time throughout the Key Stage.
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**Key Stage 5:**

**What my child will learn in Year 12- Core (AQA)**

Year 12	Term 1	Term 2	Term 3	Term 4	Term 5	Term 6
Unit Title	<b>Fermi Estimation</b> <b>Financial Maths</b> <b>Representing Data</b>	<b>Representing Data</b> <b>Financial Maths</b> <b>Critical Analysis</b>	<b>Statistical Techniques (Option 2A)</b>	<b>Critical Analysis</b> <b>Statistical Techniques</b>	<b>Exam Prep Preliminary Material</b>	<b>Exam</b>
Previous knowledge recalled	<b>Fermi Estimation</b> Perimeter, area, surface area Rearranging formulae Estimation  <b>Financial Maths</b> Percentages  <b>Representing Data</b> Representing and analysing data Averages Grouped data	<b>Representing Data</b> Standard deviation Regression  <b>Financial Maths</b> Percentages Financial terminology  <b>Critical Analysis</b> Language techniques Graphs	<b>Statistical Techniques (Option 2A)</b> All Graphs Averages Sampling	<b>Critical Analysis</b> Language techniques Graphs Analysing graphs and statements  <b>Statistical Techniques</b> Normal distribution Confidence Intervals	<b>Revision</b> All topics covered to be revised	
New Knowledge	<b>Fermi Estimation</b> Fermi estimation Using mathematical models  <b>Financial Maths</b> Financial terminology  <b>Representing Data</b> Standard deviation Regression	<b>Representing Data</b> Box Plots IQR Histograms  <b>Financial Maths</b> Inflation Price Index  <b>Critical Analysis</b> Analysing graphs and statements	<b>Statistical Techniques (Option 2A)</b> Normal distribution Confidence Intervals Sampling PMCC (Product Moment Correlation Coefficient)	<b>Critical Analysis</b> Analysing graphs and statements  <b>Statistical Techniques</b> Sampling PMCC (Product Moment Correlation Coefficient)	<b>Preliminary Material</b>	
Key Knowledge Assessment	End of term Fermi Estimation Financial maths Representing data	End of term Representing data Financial maths Critical analysis	PPE	End of term Critical Analysis Statistical techniques	Mid Term Past Preliminary material	
Links to literacy and numeracy	<b>Literacy:</b> Reading and processing the question to	<b>Literacy:</b> Familiarisation of the key vocabulary to	<b>Literacy:</b> Reading and processing the question to	<b>Literacy:</b> Familiarisation of the key vocabulary to	<b>Literacy:</b> Reading and processing the question to	<b>Literacy:</b> Familiarisation of the key vocabulary to



	ensure delivery of the correct method and solution.  <b>Numeracy:</b> Consolidation of the key crossover skills from Higher GCSE	ensure the correct method is applied.  <b>Numeracy:</b> Extension of the key principles and guidance as to where they fit in and where they are heading	ensure delivery of the correct method and solution.  <b>Numeracy:</b> Building upon the foundations established in term 1 and 2	ensure the correct method is applied.  <b>Numeracy:</b> Extension of the key principles and guidance as to where they fit in and where they are heading	ensure delivery of the correct method and solution.  <b>Numeracy:</b> Introduction of new skills and processes and purposeful practise of these.	ensure the correct method is applied.  <b>Numeracy:</b> Extension of the key principles and guidance as to where they fit in and where they are heading
Extra-Curricular opportunities	Links with UKC to be explored. Trips and visits.					
Links to careers/aspirations	Jobs in Finance, Graphic design, Personal Finance, Insurance, risk analysis, accountancy					
Links to our Fulston FAMILY values	<p><b>Fortitude</b>- Having the resilience and determination to keep trying when we are finding it tough  <b>Ambition</b>- Striving for excellence and being aware of our gaps in understanding  <b>Mindful</b>- Developing our own metacognition so that we become independent life-long learners  <b>Integrity</b> – Being diligent in our studies so that we are in control of our own journey  <b>Leadership</b>- Take the lead in class so that we set a good example to our peers  <b>Young Citizens</b>- Be aware of how our mathematical education fits in with the value we can add to our community.</p>					

### What my child will learn in Year 12- Pure

Year 12	Term 1	Term 2	Term 3	Term 4	Term 5	Term 6
Unit Title	<b>Algebraic expressions</b> <b>Quadratics</b> <b>Equations and Inequalities</b>	<b>Graphs and Transformation s</b> <b>Straight line graphs</b> <b>Circles</b>	<b>Algebraic Fractions</b> <b>Binomial Expansions:</b> <b>Binomial Theorem)</b>	<b>Trigonometry ratios</b> <b>Trig Identities and Equations</b>	<b>Differentiation</b> <b>Integration</b>	<b>Logarithm</b> <b>Vectors</b> <b>Revision/PPE</b>
Previous knowledge recalled	<p><b>Quadratic Equations:</b> Recall the standard form of quadratic equations and how to solve them.  <b>Vertex Form:</b> Understand the vertex form of a quadratic equation and its properties.  <b>Discriminant:</b> Know the discriminant and how it relates to the nature of the solutions.  <b>Inequalities:</b> Understand the representation and solution of quadratic inequalities.  <b>Quadratic Functions:</b> Recall the graph of a quadratic</p>	<p><b>Graphing Circles:</b> Know how to graph circles on the coordinate plane  <b>Circle Properties:</b> Understand properties such as diameter, circumference, and area.  <b>Distance Formula:</b> -Recall the distance formula used to find the distance between points in the plane.</p>	<p><b>Simplification:</b> Know how to simplify algebraic fractions by cancelling common factors.  <b>Addition and Subtraction:</b> Understand how to add and subtract algebraic fractions with different denominators.  <b>Equations with Algebraic Fractions:</b> Recall solving equations that involve algebraic fractions.  <b>Binomial Coefficients:</b> Remember the coefficients in the binomial expansion, often represented by "n choose k."</p>	<p><b>Trigonometric Ratios:</b> Recall the definitions of sine, cosine, and tangent in right triangles.  <b>Angle Measures:</b> Understand degrees and radians as units for measuring angles.  <b>Special Triangles:</b> Know the properties of 30-60-90 and 45-45-90 triangles.</p>	<p><b>Differentiation Derivative Basics:</b>            -Understanding the concept of a derivative, which measures the rate of change.  <b>Differentiation Rules:</b>            Recall fundamental rules such as the power rule and chain rule.  <b>Integration:</b>            -Understanding the concept of an integral as a limit of Riemann sums.  <b>Antiderivatives:</b>            Recall the connection between antiderivatives and integrals.</p>	<p><b>Vector Basics:</b>            Magnitude            Direction            Representation of vectors  <b>Operations:</b>            -Addition            -subtraction            -scalar            -multiplication</p>



	function and its key features.					
New Knowledge	<p><b>Completing the Square:</b> Teach the process of completing the square to rewrite quadratic equations in vertex form</p> <p><b>Quadratic Formula:</b> Explain the quadratic formula as a method to solve quadratic equations Extend knowledge to solving quadratic inequalities using sign analysis and number line plots Introduce systems of quadratic equations and inequalities.</p>	<p><b>Polar Coordinates:</b> -Extend knowledge to representing circles in polar coordinates.</p> <p><b>Graphing Software:</b> Familiarise students with graphing software or calculators for visualising circle properties and transformations.</p>	<p><b>Complex Fractions:</b> Introduce complex or compound fractions and how to simplify them.</p> <p><b>Partial Fractions:</b> Teach the process of decomposing a complex fraction into simpler partial fractions.</p> <p><b>Rational Expressions:</b> Explain the concept of rational expressions and how they relate to algebraic fractions.</p> <p><b>Expanding Binomials:</b> Know how to expand binomial expressions using the binomial theorem.</p> <p><b>General Binomial Expansion Formula:</b> Remember the formula for expanding <math>(a + b)^n</math>.</p>	<p><b>Unit Circle:</b> Introduce the unit circle and its relationship to trigonometric functions.</p> <p><b>Trigonometric Graphs:</b> Know how to graph trigonometric functions, including amplitude and period.</p>	<p><b>Differentiation: Maximum and Minimum:</b> Recall how derivatives are used to find maximum and minimum points in functions. Integration Improper <b>Integrals:</b> Introduce the concept of improper integrals and how to evaluate them.</p>	<p><b>Logarithms and Vectors:</b> Real-world applications in physics, engineering</p>
Key Knowledge Assessment	<p><b>Mid Term Assessment</b> Indices, Surd, factoring and completing the square.</p> <p><b>End of Term Assessment</b> Straight line graphs, Solving inequalities and simultaneous equations.</p>	<p><b>Mid Term Assessment</b> Transformations of graphs Equations of lines Completing the square</p> <p><b>End of Term Assessment</b> Equations of lines Factor theorem Polynomial division Binomial expansion Sine/Cosine Rule</p>	<p><b>Mid Term Assessment</b> Indices Factor theorem Quadratic simultaneous equations Straight lines Equations of circles</p> <p><b>End of Term Assessment</b> Indices Surds Straight line graphs Trigonometric equations Trigonometric identities Volume</p>	<p><b>Mid Term Assessment</b> First principles Increasing/decreasing functions Differentiation Trigonometric equations Logs</p> <p><b>End of Term Assessment</b> Factor theorem Polynomial division Binomial expansion Circles Trigonometric equations Calculus Vectors</p>	<p><b>Mid Term Assessment</b> Integration Sine/Cosine rule Logarithms Binomial expansion Equations of circles</p> <p><b>End of Term Assessment</b> Integration Factor theorem Polynomial division Vectors Cosine Rule Exponentials</p>	<p><b>PPEs</b> All topics from year 1</p>



			Plotting quartic graphs			
Links to literacy and numeracy	<p><b>Literacy:</b> Reading and processing the question to ensure delivery of the correct method and solution.</p> <p><b>Numeracy:</b> Consolidation of the key crossover skills from Higher GCSE</p>	<p><b>Literacy:</b> Familiarisation of the key vocabulary to ensure the correct method is applied.</p> <p><b>Numeracy:</b> Extension of the key principles and guidance as to where they fit in and where they are heading</p>	<p><b>Literacy:</b> Reading and processing the question to ensure delivery of the correct method and solution.</p> <p><b>Numeracy:</b> Building upon the foundations established in term 1 and 2</p>	<p><b>Literacy:</b> Familiarisation of the key vocabulary to ensure the correct method is applied.</p> <p><b>Numeracy:</b> Extension of the key principles and guidance as to where they fit in and where they are heading</p>	<p><b>Literacy:</b> Reading and processing the question to ensure delivery of the correct method and solution.</p> <p><b>Numeracy:</b> Introduction of new skills and processes and purposeful practise of these.</p>	<p><b>Literacy:</b> Familiarisation of the key vocabulary to ensure the correct method is applied.</p> <p><b>Numeracy:</b> Extension of the key principles and guidance as to where they fit in and where they are heading</p>
Extra-Curricular opportunities	Links with UKC to be explored. Trips and visits.					
Links to careers/aspirations	Engineering and Physics, Financial Analysis, Economics, Data Analyst, Data Scientist, Geospatial Analyst, GIS Specialist, Quantum Computing Scientist, Engineer					
Links to our Fulston FAMILY values	<p><b>Fortitude-</b> Having the resilience and determination to keep trying when we are finding it tough <b>Ambition-</b> Striving for excellence and being aware of our gaps in understanding</p> <p><b>Mindful-</b> Developing our own metacognition so that we become independent life-long learners <b>Integrity</b> – Being diligent in our studies so that we are in control of our own journey</p> <p><b>Leadership-</b> Take the lead in class so that we set a good example to our peers</p> <p><b>Young Citizens-</b> Be aware of how our mathematical education fits in with the value we can add to our community.</p>					



### What my child will learn in Year 12- STATISTICS and MECHANICS

Year 12	Term 1	Term 2	Term 3	Term 4	Term 5	Term 6
Unit Title	<b>Data collection Measures of location and spread</b>	<b>Representation of data Correlation</b>	<b>Probability Statistical distribution</b>	<b>Hypothesis testing Modelling in Mechanics</b>	<b>Constant Acceleration Forces and motion</b>	<b>Variable acceleration Revision/PPE</b>
Previous knowledge recalled	<p><b>Data Collection</b></p> <p>Recall A foundational understanding of basic statistical concepts and methods, such as mean, median, and standard deviation.</p> <p><b>Measure of location and spread:</b></p> <p>Recall statistical measures of location, such as mean and median, and measures of spread, like standard deviation.</p>	<p><b>Representing data:</b></p> <p>Recall basic descriptive statistics, including data representation through graphs and charts</p> <p><b>Correlation:</b></p> <p>Recall fundamental understanding of statistical concepts, particularly measures of association and scatterplots</p>	<p><b>Probability:</b></p> <p>A solid grasp of foundational probability concepts, including basic probability rules and understanding of probability distributions and tree diagrams</p> <p><b>Statistical distribution:</b></p> <p>Recall fundamental statistical concepts, including probability distributions and key characteristics such as mean</p>	<p><b>Hypothesis Testing:</b></p> <p>A solid recall of basic statistical concepts, including hypothesis formulation, p-values, and significance levels, from GCSE level</p> <p><b>Modelling in mechanics:</b></p> <p>Recall fundamental principles in mechanics, such as Newton's laws and vector analysis</p>	<p><b>Constant acceleration: -</b></p> <p>Recall the fundamental concepts in physics, including equations of motion and the principles of constant acceleration from GCSE</p> <p><b>Forces and motion:</b></p> <p>understanding of Newtonian mechanics, encompassing concepts like force, mass, and acceleration from GCSE</p>	<p><b>Variable acceleration:</b></p> <p>A foundational comprehension of core principles in physics, including differential calculus and the fundamental equations of motion, is necessary for a comprehensive exploration of the Year 12 topic on variable acceleration</p>



			and standard deviation.			
New Knowledge	<p><b>Data Collection</b></p> <p>Understand how to collect data ethically and interpret skewness</p>	<p><b>Correlation:</b></p> <p>To understand the differences between <b>correlation</b> and <b>causations</b>.</p>	<p><b>Statistical distribution:</b></p> <p>understanding of probability distributions, allowing students to comprehend how data is spread and the likelihood of specific outcomes</p>	<p><b>Hypothesis testing:</b></p> <p>Understanding significant levels and interpreting P-Values</p>	<p><b>Constant acceleration:</b></p> <p>To understand the proficiency of Kinetic equations and its real-life application.</p>	<p><b>Variable acceleration:</b></p> <p>To understand how to apply differential calculus to understand and analyse changing rates of motion.</p>
Key Knowledge Assessment	<p><b>Mid-term assessment</b></p> <p>Group frequency tables Quartiles Sampling methods Standard deviation</p> <p><b>End of term assessment</b></p> <p>Histograms Box Plots Group frequency tables Quartiles Sampling methods Standard deviation</p>	<p><b>Mid-term assessment</b></p> <p>Standard Deviation Histogram Venn Diagrams Lines of regression</p> <p><b>End of term assessment</b></p> <p>Group frequency tables Standard deviation Probability distribution</p>	<p><b>Mid-term assessment</b></p> <p>Histograms Box Plots Standard deviation Lines of regression Probability distribution</p> <p><b>End of term assessment</b></p> <p>Sampling methods Venn diagrams Probability Quartiles Probability distributions Hypothesis testing</p>	<p><b>Mid-term assessment</b></p> <p>Probability Velocity time graphs Object in motion Acceleration</p> <p><b>End of term assessment</b></p> <p>Sampling methods Histograms Probability distributions Box plots Object in motion Velocity time graphs</p>	<p><b>Mid-term assessment</b></p> <p>Velocity time graph Object in motion Displacement Forces Pulley Vectors</p> <p><b>End of term assessment</b></p> <p>Histograms Box plots Standard deviation Velocity time graph Velocity/acceleration</p>	<p><b>PPE</b></p> <p>All topics from year 1</p>
Links to literacy and numeracy	<p><b>Literacy:</b></p> <p>The ability to interpret and communicate findings effectively, ensuring clear and accurate explanations of the spread of data.</p>	<p><b>Literacy:</b></p> <p>Students enhance their literacy in statistics by developing the ability to interpret correlation coefficients.</p>	<p><b>Literacy:</b></p> <p>Students gain literacy skills by learning to interpret and understand the characteristics of various statistical distributions, including measures like mean, median,</p>	<p><b>Literacy:</b></p> <p>Students can articulate and evaluate assumptions about population parameters before statistical analysis.</p>	<p><b>Literacy:</b></p> <p>Students enhance literacy by interpreting and grasping the kinematic equations, enabling a clear understanding of how objects move under</p>	<p><b>Literacy:</b></p> <p>Students are able to articulate and analyse the changing relationships between displacement, velocity, and time.</p>



	<p><b>Numeracy:</b></p> <p>Interpreting numerical data representations, like histograms or box plots</p>	<p><b>Numeracy:</b></p> <p>Students learn to analyse patterns, identify trends, and make informed judgments about the strength and direction of correlations based on the visual representation of data points.</p>	<p>and standard deviation</p> <p><b>Numeracy:</b></p> <p>Understanding probability, a key aspect of data spread analysis, involves numeracy skills for calculating probabilities.</p>	<p><b>Numeracy:</b></p> <p>Students gain numeracy skills related to mathematical modelling, allowing them to express and analyse the relationships between variables</p>	<p>constant acceleration.</p> <p><b>Numeracy:</b></p> <p>students apply mathematical formulas to analyse and calculate quantities related to constant acceleration, fostering a hands-on understanding of mathematical concepts.</p>	<p><b>Numeracy:</b></p> <p>students apply mathematical calculations to analyse scenarios involving variable acceleration, allowing them to make precise calculations and draw quantitative conclusions about changing motion.</p>
Extra-Curricular opportunities	Online mathematics exploration with the University of Kent.					
Links to careers/aspirations	Achieving proficiency in A-level statistics and mechanics not only provides a strong foundation for pursuing a career in data science or engineering but also aligns seamlessly with my aspirations to contribute innovatively to technological advancements and analytical problem-solving.					
Links to our Fulston FAMILY values	<p><b>Fortitude</b>- Having the resilience and determination to keep trying when we are finding it tough <b>Ambition</b>- Striving for excellence and being aware of our gaps in understanding</p> <p><b>Mindful</b>- Developing our own metacognition so that we become independent life-long learners <b>Integrity</b> – Being diligent in our studies so that we are in control of our own journey</p> <p><b>Leadership</b>- Take the lead in class so that we set a good example to our peers</p> <p><b>Young Citizens</b>- Be aware of how our mathematical education fits in with the value we can add to our community.</p>					



### What my child will learn in Year 13 Pure

Year 13	Term 1	Term 2	Term 3	Term 4	Term 5	Term 6
Unit Title	<b>Sequence and Series</b>	<b>Binomial Expansion</b>	<b>Trigonometry Functions</b> <b>Trigonometry Modelling &amp; Radians</b>	<b>Differentiation</b> <b>Integration</b>	<b>Numerical Methods</b> <b>Vectors</b>	
Previous knowledge recalled	<p><b>Sequences:</b> Recall the concept of a sequence as an ordered list of numbers.</p> <p><b>Arithmetic Sequences:</b> Understand the properties of arithmetic sequences, including common differences.</p> <p><b>Geometric Sequences:</b> Know the characteristics of geometric sequences, including common ratios</p>	<p><b>Pascal's Triangle:</b> Understand how binomial coefficients are arranged in Pascal's Triangle.</p> <p><b>Expanding Binomials:</b> Know how to expand binomial expressions using the binomial theorem.</p>	<p><b>Trigonometric Identities:</b> Remember fundamental identities like the Pythagorean identities.</p> <p><b>Solving Triangles:</b> Recall methods for solving triangles, including the Law of Sines and Law of Cosines.</p>	<p><b>Derivatives of Common Functions:</b> Knowing derivatives of common functions like trigonometric, exponential, and logarithmic functions.</p> <p><b>Integration Techniques:</b> Recall various techniques for finding integrals, such as substitution and integration by parts.</p>	<p><b>Approximation:</b> Recall the core concept of approximating solutions to mathematical problems.</p> <p><b>Iterative Methods:</b> Understand the use of iteration to approach solutions.</p> <p><b>Linear Systems:</b> Recall methods for solving systems of linear equations.</p> <p><b>Vectors:</b> Dot Product Cross Product Definitions and geometric interpretation (3D).</p>	
New Knowledge	<b>Convergence and Divergence:</b> Teach the concepts of convergent and	<b>Binomial Expansion:</b> Introduce the extension of the	<b>Inverse Trigonometric Functions:</b> Explain arcsin,	<b>Implicit Differentiation:</b> Teaching techniques for	<b>Numerical Methods:</b> Learn linear and polynomial	



	<p>divergent sequences and series.</p> <p><b>Geometric Series:</b> Explore the properties and sum formulas for geometric series.</p>	<p>binomial theorem for more than two terms.</p> <p>Learn how binomial expansion is used in probability, statistics, and combinatorics.</p>	<p>arccos, and arctan as inverse functions.</p> <p>Extend knowledge with advanced identities, such as double angle and half-angle identities.</p>	<p>differentiating implicitly defined functions.</p> <p><b>Integration:</b> Extend integration to multiple dimensions with double and triple integrals. Explore how integrals are used in solving differential equations.</p>	<p>interpolation to estimate values between data points.</p> <p>Explain methods for approximating definite integrals, such as the trapezoidal rule and Simpson's rule.</p> <p><b>Vectors:</b> Vector space Linear independence Vector functions (3D)</p>	
Key Knowledge Assessment	<p><b>Mid Term Assessment</b> Logarithms, Algebraic methods, Proofs and function.</p> <p><b>End of Term Assessment</b> Factor theorem, Vectors, Functions, Differentiation</p>	<p><b>Mid Term Assessment</b> Sequence and series Binomial expansions Differentiation Trig</p> <p><b>End of Term Assessment</b> Small angles approximation Parametric equations Trig proofs</p>	PPEs	<b>End Of Term Assessment</b> Past exams paper	<b>FINAL EXAMS</b>	
Links to literacy and numeracy	<p><b>Literacy:</b> Familiarisation with the wording of exam questions</p> <p><b>Numeracy:</b> Relentless practise of applying the correct numerical process in order to answer the question effectively</p>	<p><b>Literacy:</b> Familiarisation with the wording of exam questions</p> <p><b>Numeracy:</b> Relentless practise of applying the correct numerical process in order to answer the question effectively</p>	<p><b>Literacy:</b> Familiarisation with the wording of exam questions</p> <p><b>Numeracy:</b> Relentless practise of applying the correct numerical process in order to answer the question effectively</p>	<p><b>Literacy:</b> Familiarisation with the wording of exam questions</p> <p><b>Numeracy:</b> Relentless practise of applying the correct numerical process in order to answer the question effectively</p>	<p><b>Literacy:</b> Exploring all past papers to increase confidence with subject specific vocabulary and awareness.</p> <p><b>Numeracy:</b> Relentless practise of applying the correct numerical process in order to answer the question effectively</p>	
Extra-Curricular opportunities	Links with UKC to be explored. Trips and visits.					
Links to careers/aspirations	financial engineering, actuarial science, engineering, robotics, designing mechanical systems, physics, climate modelling, materials science					
Links to our Fulston FAMILY values	<p><b>Fortitude</b>- Having the resilience and determination to keep trying when we are finding it tough <b>Ambition</b>- Striving for excellence and being aware of our gaps in understanding</p> <p><b>Mindful</b>- Developing our own metacognition so that we become independent life-long learners <b>Integrity</b> – Being diligent in our studies so that we are in control of our own journey</p> <p><b>Leadership</b>- Take the lead in class so that we set a good example to our peers</p>					



**Young Citizens-** Be aware of how our mathematical education fits in with the value we can add to our community.

**Extended Learning Opportunities for Key Stage 5**

After school sessions held each week  
A Level teachers available during study times to enrich learning experience or consolidate previous learning.

**What my child will learn in Year 13 Statistics and Mechanics**

Year 13	Term 1	Term 2	Term 3	Term 4	Term 5	Term 6
Unit Title	<b>Regression, correlation and Hypothesis testing</b>	<b>Conditional probability</b>  <b>Normal distribution</b>	<b>Moments</b>	<b>Forces and frictions</b>	<b>Projectiles and further Kinematics</b>	<b>Revision and assessment</b>
Previous knowledge recalled	<b>Regression and correlation:</b> A foundational understanding of basic statistical concepts, including correlation coefficients and scatterplots	<b>Conditional probability:</b> Students will revisit the concept of mutually exclusive events and how it relates to conditional probability	<b>Moments:</b> Students will recall a fundamental understanding of forces, equilibrium conditions, and basic vector concepts is crucial as foundational knowledge for comprehending moments in physics	<b>Forces and frictions:</b> Recall how frictional forces impact the equilibrium and motion of objects from Year 12	<b>Projectiles:</b> Students will learn the dynamics of their motion, launch angles, and velocities, and apply mathematical principles to analyse and predict the trajectory.  <b>Further Kinematics:</b> Apply mathematical principles to analyse displacement, velocity, and	Mixed exercises from each chapter  Past exams questions



					acceleration in various scenarios	
New Knowledge	<p><b>Hypothesis testing:</b></p> <p>Interpreting results by referring to key words such as null hypotheses and p-values</p>	<p><b>Normal distribution:</b></p> <p>Students will learn the bell-shaped curve, mean, standard deviation, and the empirical rule.</p>	<p><b>Moments:</b></p> <p>Apply moment concepts to practical scenarios, such as beam analysis and structural equilibrium, enhancing problem-solving skills in real-world engineering contexts</p>	<p><b>Forces and frictions:</b></p> <p>Analyse the interplay between forces and frictions, understanding how frictional forces influence the equilibrium and motion of objects, with a focus on practical applications and problem-solving in real-world scenarios</p>	<p><b>Projectiles:</b></p> <p>Students will learn the dynamics of their motion, launch angles, and velocities, and apply mathematical principles to analyse and predict the trajectory.</p> <p><b>Further Kinematics:</b></p> <p>Apply mathematical principles to analyse displacement, velocity, and acceleration in various scenarios</p>	
Key Knowledge Assessment	<p><b>Mid Term Assessment</b> Hypothesis Scatter Diagrams</p> <p><b>End of Term Assessment</b> Hypothesis. Scatter diagrams. Box Plot.</p>	<p><b>Mid Term Assessment</b> Conditional Probability. Normal Distribution</p> <p><b>End of Term Assessment</b> Conditional Probability. Normal Distribution.</p>	<p><b>Mid Term Assessment</b> Conditional Probability. Normal Distribution. Hypothesis. Box plot and large data.</p> <p><b>End of Term Assessment</b></p> <p>Normal Distribution. Hypothesis. Box plot and large data. Moments</p>	<p><b>End of term</b> PPES</p>	<p><b>End Of Term Assessment</b> Past exams paper</p>	<b>FINAL EXAMS</b>
Links to literacy and numeracy	<p><b>Literacy:</b></p> <p>The ability to interpret and communicate findings effectively, ensuring clear and accurate</p>	<p><b>Literacy:</b></p> <p>Students enhance their literacy in statistics by developing the ability to interpret</p>	<p><b>Literacy:</b></p> <p>Students gain literacy skills by learning to interpret and understand the characteristics of various statistical</p>	<p><b>Literacy:</b></p> <p>Students can articulate and evaluate assumptions about population parameters</p>	<p><b>Literacy:</b></p> <p>Students enhance literacy by interpreting and grasping the kinematic equations, enabling a clear</p>	



	<p>explanations of the spread of data.</p> <p><b>Numeracy:</b> Interpreting numerical data representations, like histograms or box plots</p>	<p>correlation coefficients.</p> <p><b>Numeracy:</b> Students learn to analyse patterns, identify trends, and make informed judgments about the strength and direction of correlations based on the visual representation of data points.</p>	<p>distributions, including measures like mean, median, and standard deviation</p> <p><b>Numeracy:</b> Understanding probability, a key aspect of data spread analysis, involves numeracy skills for calculating probabilities.</p>	<p>before statistical analysis.</p> <p><b>Numeracy:</b> Students gain numeracy skills related to mathematical modelling, allowing them to express and analyse the relationships between variables</p>	<p>understanding of how objects move under constant acceleration.</p> <p><b>Numeracy:</b> students apply mathematical formulas to analyse and calculate quantities related to constant acceleration, fostering a hands-on understanding of mathematical concepts.</p>	
Extra-Curricular opportunities	Online mathematics exploration with the University of Kent.					
Links to careers/aspirations	financial engineering, actuarial science, engineering, robotics, designing mechanical systems, physics, climate modelling, materials science					
Links to our Fulston FAMILY values	<p><b>Fortitude-</b> Having the resilience and determination to keep trying when we are finding it tough <b>Ambition-</b> Striving for excellence and being aware of our gaps in understanding</p> <p><b>Mindful-</b> Developing our own metacognition so that we become independent life-long learners <b>Integrity</b> – Being diligent in our studies so that we are in control of our own journey</p> <p><b>Leadership-</b> Take the lead in class so that we set a good example to our peers</p> <p><b>Young Citizens-</b> Be aware of how our mathematical education fits in with the value we can add to our community.</p>					

<p><b>Extended Learning Opportunities for Key Stage 5</b></p>	<ol style="list-style-type: none"> <li> <p><b>Online Courses and Platforms:</b></p> <ul style="list-style-type: none"> <li>Platforms like Khan Academy, Coursera, or edX offer comprehensive online courses in A-level mathematics. These courses often include video lectures, interactive exercises, and assessments, providing students with an opportunity to reinforce their understanding of key concepts and explore additional topics beyond the standard curriculum.</li> </ul> </li> <li> <p><b>Tutoring and Study Groups:</b></p> <ul style="list-style-type: none"> <li>Engaging in personalized tutoring or joining study groups can provide a more interactive and collaborative learning experience. Tutors can offer individualized guidance; addressing specific challenges and helping students delve deeper into the subject. Study groups facilitate peer-to-peer learning, allowing students to share insights, discuss complex problems, and reinforce their understanding through collaborative efforts.</li> </ul> </li> <li> <p><b>Participation in Math Competitions:</b></p> <ul style="list-style-type: none"> <li>Involvement in mathematics competitions, such as the United Kingdom Mathematics Trust (UKMT) competitions or International Mathematical Olympiad (IMO) training, can offer a unique and challenging extension to the A-level maths curriculum.</li> </ul> </li> </ol>
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**Curriculum Impact**

The aims and learning outcomes of this curriculum is to enable students to develop the ability to:

- Rise to the challenge of demanding and fulfilling content,
- Demonstrate the mathematical skills, knowledge and understanding that are as good as that of the highest performing jurisdictions in the world
- Have a strong foundation for further academic and vocational study and for employment
- Demonstrate the appropriate mathematical skills, knowledge and understanding to help them progress to a full range of courses in further and higher education.
  - This includes Level 3 mathematics courses as well as Level 3 and undergraduate courses in other disciplines such as biology, geography and psychology, where the understanding and application of mathematics is crucial
- Develop fluent knowledge, skills and understanding of mathematical methods and concepts
- Acquire, select and apply mathematical techniques to solve problems
- Reason mathematically, make deductions and inferences, and draw conclusions
- Comprehend, interpret and communicate mathematical information in a variety of forms appropriate to the information and context.