

	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
<b>Year 7</b>	<p><b>Topic:</b> Linear Algebra and Number</p> <p><b>Assessment:</b> Class based assessments only.</p> <p><b>Knowledge:</b> Multiplication and division, BIDMAS, HCF/LCM, Index laws, Gathering like terms, Cancelling fractions, Fractions, Decimals</p> <p><b>Skills:</b> concept of algebra, manipulation of number, calculator work, problem solving</p> <p><b>Extension:</b> Solving linear equations, Introduction of negative indices</p>	<p><b>Topic:</b> Sequences, Quadrilaterals and Polygons</p> <p><b>Assessment:</b> RA single calculator paper – 40 minutes</p> <p><b>Knowledge:</b> Sequences, properties of quadrilaterals and triangles, Angles in parallel lines, Angles in polygons, Introduction to mathematical proof</p> <p><b>Skills:</b> shape work, use of a calculator, introduction to formulae, proof and reasoning, pattern spotting</p> <p><b>Extension:</b> Special sequences, Proof of angle facts</p>	<p><b>Topic:</b> Shapes and Graphs</p> <p><b>Assessment:</b> class based assessments only</p> <p><b>Knowledge:</b> The co-ordinate grid, Characteristics of 2D and 3D shapes, Areas of 2D shapes and Volumes of 3D shapes, Circles, Nets and Plans and Equations of simple lines</p> <p><b>Skills:</b> understanding shape and space, calculator work, working with formulae, Communication and description in mathematics</p> <p><b>Extension:</b> Volumes of compound shapes</p>	<p><b>Topic:</b> Percentages, decimals and Fractions and Further Algebra</p> <p><b>Assessment:</b> Full RA – single 40 minute paper</p> <p><b>Knowledge:</b> Converting between fractions, decimals and percentages, Use of F,D and P, Factorising, Expanding, simple linear equations</p> <p><b>Skills:</b> Working without a calculator, understanding reverse operations, understanding equivalence, representing concepts with algebra</p> <p><b>Extension:</b> Repeated percentage change (2 years)</p>	<p><b>Topic:</b> Transformations and Further Algebra 2</p> <p><b>Assessment:</b> End of year Exams – all 5 terms.</p> <p><b>Knowledge:</b> Completing and describing the 4 transformations, Linear algebra, solving equations, setting up and solving equations</p> <p><b>Skills:</b> Communication and description in mathematics, drawing and pencil skills, Creation (algebraic), Visual reasoning</p> <p><b>Extension:</b> Vectors, negative enlargements</p>	<p><b>Topic:</b> Probability and Data</p> <p><b>Assessment:</b> Project based assessment only</p> <p><b>Knowledge:</b> Listing outcomes, probabilities from tables and diagrams, AND and OR rules, The probability scale, Averages and range, Quartiles and IQR, Scatter graphs</p> <p><b>Skills:</b> Real life concepts, idea of scale, evaluation of data, communication and reasoning in mathematics, reasoning.</p> <p><b>Extension:</b> Mean from data in a table</p>
	<p><b>Rationale:</b> students feel comfortable with concepts in Number as this is usually previously seen content and leads them in nicely. Algebra is an important tool in Mathematics so it is important to introduce them to it early as it runs through all 6 terms.</p>	<p><b>Rationale:</b> The concepts of angles and shapes and patterns are familiar to students but this unit helps them to formalise the things they know more precisely and allows students to develop a love of the patterns that appear in the world.</p>	<p><b>Rationale:</b> Graph work is always a challenging area of work so linking it to a familiar topic of shapes allows students to understand the meaning behind some graphical concepts. This term links nicely with the previous term where students have studied angles of shapes and now are looking at areas and perimeters.</p>	<p><b>Rationale:</b> Students need to be confident recognising the equivalence of fractions, decimals and percentages. It is vital to build confidence without a calculator here. By now students have been exposed to formulae and rules using algebra and the next step is to create linear equations.</p>	<p><b>Rationale:</b> From last term students are starting to develop their algebraic skills and now need to learn how to create their own equations and link the abstract concept with real life situations. Transformations is a lighter, complimentary subject that many students enjoy and tests other skills such as drawing and visual reasoning</p>	<p><b>Rationale:</b> Instruction of averages can vary from primary schools and hence we save this topic until students are proficient with other areas of numerical reasoning and communication. Probability creates nice avenues for project work or creation of games / experiments which works well in term 6</p>

	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
<b>Year 8</b>	<p><b>Topic:</b> Number and Shape</p> <p><b>Assessment:</b> Written Assessment</p> <p><b>Knowledge:</b> Estimation, Rounding, Index Laws, Surds, Rearranging formulae, Circles, Problem Solving</p> <p><b>Skills:</b> Estimation and precision, Evaluation of techniques, use of algebra, problem solving, algebraic manipulation</p> <p><b>Extension:</b> Rationalising surds and solving equations that involve them.</p>	<p><b>Topic:</b> Quadratic Algebra and Further Number</p> <p><b>Assessment:</b> class based assessments only</p> <p><b>Knowledge:</b> Linear equations involving expanding, expanding and factorising 2 brackets, Problem solving, Multi-stage problems</p> <p><b>Skills:</b> algebraic manipulation, problem solving, multi-stage processing, layout and communication</p> <p><b>Extension:</b> Shapes leading to quadratics</p>	<p><b>Topic:</b> Trigonometry and Proof</p> <p><b>Assessment:</b> class based assessments only</p> <p><b>Knowledge:</b> Properties of right angled triangles, Angle recap, Pythagoras, Simple geometric proof and reasoning, Introduction to SOHCAHTOA, Bearings</p> <p><b>Skills:</b> Shape work and visual reasoning, application of a formulae, derivation of a rule, proof and reasoning, communication in mathematics.</p> <p><b>Extension:</b> Trigonometric problem solving</p>	<p><b>Topic:</b> Percentages, Decimals and Fractions, Ratio</p> <p><b>Assessment:</b> Written Assessment</p> <p><b>Knowledge:</b> Converting between complex fractions, decimals and percentages, recurring decimals, repeated percentage change, reverse percentages, ratio and proportion, word problems</p> <p><b>Skills:</b> Working without a calculator, concept of equivalence, real life problem, multistage problem solving, financial issues</p> <p><b>Extension:</b> Introduction to algebraic fractions</p>	<p><b>Topic:</b> Data</p> <p><b>Assessment:</b> Final Assessments – all 5 terms of topics</p> <p><b>Knowledge:</b> Questionnaires, averages from a list, averages from a table, scatter diagrams, quartiles and IQR, Comparing data, Interpreting Graphs and charts.</p> <p><b>Skills:</b> Real life concepts, mathematical communication and reasoning, evaluation of techniques, comparison of sets of data, visual representation</p> <p><b>Extension:</b> Histograms (equal widths only)</p>	<p><b>Topic:</b> Graphs and inequalities</p> <p><b>Assessment:</b> Project based assessment only.</p> <p><b>Knowledge:</b> Recapping the co-ordinate grid, plotting lines, <math>y=mx+c</math>, drawing straight lines, plotting quadratics from a table, linear inequalities</p> <p><b>Skills:</b> algebraic reasoning, moving between visual and algebraic representations, pencil and ruler work.</p> <p><b>Extension:</b> Graphical inequalities</p>
	<p><b>Rationale:</b> The concept of estimation and precision will help with all upcoming units – with the skill of deciding if answers are appropriate as topics become more abstract. Equally problem solving is a skill for all topics so this helps build the foundation.</p>	<p><b>Rationale:</b> Students are now familiar with all elements of linear algebra and need to focus on quadratic algebra. There are a lot of avenues for extension here for those higher achievers so it's a good start to the year.</p>	<p><b>Rationale:</b> Now students are confident with basic numeracy and algebraic reasoning, proof is a good chance to develop their communication in the subject. Trigonometry will stretch students.</p>	<p><b>Rationale:</b> This concept develops understanding from year 11 but allows students to incorporate multi stage problems and also to link Mathematics to real life issues such as finance. It is a lighter, more practical topic after the heaviness of unit 3.</p>	<p><b>Rationale:</b> Drawing on real life concepts from the previous unit, students can start to look into data and statistics and evaluate how these can be used. Their communication and reasoning should be stronger now and this unit provides them to create questions as well as answers.</p>	<p><b>Rationale:</b> This topic is a challenging one and complements the unit before well. Students always find graphs challenging so we've chosen to wait until they have seen all other units. It also keeps graph work topped up before it appears in the GCSE scheme of work.</p>

We follow the EDEXCEL 9-1 GCSE for Years 9, 10 and 11 with terminal exams in year 11.

	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
<b>Year 9</b>	<p><b>Topic:</b> Number</p> <p><b>Assessment:</b> Unit Tests only</p> <p><b>Knowledge:</b> Estimation, Rounding, HCF/LCM, Indices, Surds</p> <p><b>Skills:</b> working without a calculator, estimation and precision, evaluation of techniques, real life problems</p> <p><b>Extension:</b> fractional indices, rationalising the denominator</p>	<p><b>Topic:</b> Algebra</p> <p><b>Assessment:</b> RA on units 1 and 2 (non –calc)</p> <p><b>Knowledge:</b> Algebraic indices, expanding and factorising, Equations, Formulae, Linear and non-linear sequences</p> <p><b>Skills:</b> understanding the concept of algebra, manipulation and representation, Use of formulae, pattern spotting</p> <p><b>Extension:</b> Rearranging formulae</p>	<p><b>Topic:</b> Data</p> <p><b>Assessment:</b> Unit tests only</p> <p><b>Knowledge:</b> Statistical diagrams, Time series graphs, Scatter graphs, lines of best fit, Averages and Range</p> <p><b>Skills:</b> Real life problems, evaluation of techniques, comparison and evaluation of data, communication in Maths, pencil and ruler skills</p> <p><b>Extension:</b> Real life graphs, creation</p>	<p><b>Topic:</b> Fractions, Ratio and Percentages</p> <p><b>Assessment:</b> RA on units 1-4</p> <p><b>Knowledge:</b> Fractions, decimals, percentages, Ratio, Proportion</p> <p><b>Skills:</b> working without a calculator, application of number theory, real life problems, reasoning</p> <p><b>Extension:</b> Basic algebraic fractions – simple cancelling</p>	<p><b>Topic:</b> Angles and Trigonometry</p> <p><b>Assessment:</b> Unit Tests Only</p> <p><b>Knowledge:</b> Properties of triangles and quadrilaterals, Angles in polygons, Pythagoras’ Theorem, Trigonometry</p> <p><b>Skills:</b> communication and reasoning, proof, application of formulae, space and shape awareness</p> <p><b>Extension:</b> Start Graphs in this term</p>	<p><b>Topic:</b> Graphs</p> <p><b>Assessment:</b> End of year exam covering all 6 units.</p> <p><b>Knowledge:</b> Linear graphs, rates of change, real life graphs, line segments, quadratic, cubic and reciprocal graphs</p> <p><b>Skills:</b> Real life problems, pencil and ruler work, moving between visual and algebraic representations, pattern spotting</p> <p><b>Extension:</b> parallel and perpendicular line problems</p>
	<p><b>Rationale:</b> This unit contains the numeracy fundamentals and no other units are separate from these skills. Therefore it is imperative to complete this unit first as it underpins all the work in mathematics.</p>	<p><b>Rationale:</b> Many students who join us in year 9 have little experience with algebra and so it is important to establish the fundamentals here early on. IT gives students a chance to see something new and a chance for us to judge them on new content rather than exposure to old content.</p>	<p><b>Rationale:</b> Communication is a big element of the 9-1 GCSE and this topic introduces students to real life problems and scenarios when maths would be helpful. After the abstract nature of unit 2, it is an important theme</p>	<p><b>Rationale:</b> This topic again supports numeracy themes and helps students to gain confidence without a calculator. Although the work is simple, the concepts here add challenge and provide scope for differentiation. Students are now starting to develop reasoning and an understanding of “why”.</p>	<p><b>Rationale:</b> This is the first time in the GCSE course that students cover shape and space and this unit compliments previous algebraic units with use of formulae. They can develop their reasoning and communication which they started with in term 4.</p>	<p><b>Rationale:</b> Students need to start early with the concept of functions and how they can be represented graphically, as equations, or as tables of values. This first unit introduces them to this concept and allows them to explore it for simple graphs. This unit is typically challenging and so is introduced after fundamental topics have been covered</p>

	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
<b>Year 10</b>	<p><b>Topic:</b> Areas, Volume, Transformations and Constructions</p> <p><b>Assessment:</b> Unit Tests Only</p> <p><b>Knowledge:</b> Area, perimeter, Bounds, Circles and sectors, 3D shapes, 4 transformations, bearings and scale drawings, Constructions, Loci</p> <p><b>Skills:</b> shape and space awareness, real life application, use of equipment, accuracy</p> <p><b>Extension:</b> creation of problems involving all topics</p>	<p><b>Topic:</b> Equations and Inequalities</p> <p><b>Assessment:</b> Unit Tests only</p> <p><b>Knowledge:</b> Solving linear equations (recap), solving quadratic equations, completing the square, simultaneous equations (including one not linear), properties of quadratics, Inequalities</p> <p><b>Skills:</b> Algebraic manipulation, understanding abstract rules, creation of algebra to express real life situations, understanding equivalence and inequality.</p> <p><b>Extension:</b> quadratic inequalities, increasing functions, factorising cubics</p>	<p><b>Topic:</b> Probability</p> <p><b>Assessment:</b> Formal RA for Setting, units 1-10</p> <p><b>Knowledge:</b> Combined events, Mutually exclusive and independent events, Experimental probability, Tree diagrams, conditional probability, Venn diagrams and set notation</p> <p><b>Skills:</b> conducting and evaluating experiments, real life problems, deciding how to answer questions, use of diagrams</p> <p><b>Extension:</b> IGCSE ratio problems</p>	<p><b>Topic:</b> Multiplicative Reasoning and Similarity and Congruence</p> <p><b>Assessment:</b> Unit Tests only</p> <p><b>Knowledge:</b> Growth and decay, compound measures, ratio and proportion, congruence, geometric proof, similarity in length, area and volume</p> <p><b>Skills:</b> Understanding number theory, Shape and space awareness, mathematical reasoning and communication, proof</p> <p><b>Extension:</b> Exponential models</p>	<p><b>Topic:</b> Further Trigonometry (plus revision and assessment)</p> <p><b>Assessment:</b> Full Mock exams to cover all year 9 and 10 content – 2 papers.</p> <p><b>Knowledge:</b> Accuracy, sine rule, cosine rule, area formulae, graphs of trigonometric functions, 3D trigonometry, transformation of trig graphs</p> <p><b>Skills:</b> precision and accuracy, mathematical reasoning, decision making, representing abstract concepts as graphs, calculator work, revision skills and exam skills</p> <p><b>Extension:</b> solving trig equations, trig identities</p>	<p><b>Topic:</b> Further Statistics (plus completion of Further Trigonometry)</p> <p><b>Assessment:</b> Unit Tests only</p> <p><b>Knowledge:</b> Sampling, Cumulative Frequency, Boxplots, Histograms, Comparison of populations.</p> <p><b>Skills:</b> Appreciation of averages in real life, application of methods, real life problems, social interaction and issues, SMSC, Drawing</p> <p><b>Extension:</b> IGCSE limits of sequences (not linked).</p>
	<p><b>Rationale:</b> This is a nice unit to start the year as shape and space are familiar to students. This unit also introduces them to real life scenarios and helps them to see problems in context – a real theme of the 9-1 GCSE.</p>	<p><b>Rationale:</b> students have already seen the basics of algebra but now must develop their understanding to more complex quadratics. By now they should be happy with the abstract nature and ready to apply to higher order questions.</p>	<p><b>Rationale:</b> Probability appears only once so it makes sense to see it in the middle of the course. Students are starting to see problems in real life contexts and this unit improves their communication and their reasoning in a forum other than proof.</p>	<p><b>Rationale:</b> Following on from term 1, students are familiar with shapes and scale factors and can combine this information now they have established the link in numeracy (term 1) and algebra (term 2). They are starting to understand the rigour of reasoning via proof and how to set it out.</p>	<p><b>Rationale:</b> After the simple trigonometry from year 9, students must extend understanding to non-right-angled triangles. They are now questioning what sin, cos and tan are and showing the graphs and waves introduces a new element to these functions and helps improve understanding.</p>	<p><b>Rationale:</b> This is a nice topic to complete after the year 10 exams and allows investigation into data and its uses and implications. It lends itself to project work and allows students a chance to recap the statistics.</p> <p><b>Note: this may be moved earlier depending on lockdowns.</b></p>

	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
<b>Year 11</b>	<p><b>Topic:</b> Equations, Graphs and Circle Theorems (<b>order may vary depending on lockdowns</b>)</p> <p><b>Assessment:</b> Diagnostic Testing</p> <p><b>Knowledge:</b> Solving simultaneous equations graphically, graphs of quadratics and cubic, circle theorems</p> <p><b>Skills:</b> moving between algebraic and visual representations, pattern spotting, mathematical reasoning and communication, drawing, making links between topics</p> <p><b>Extension:</b> Differentiation, tangents and stationary points, equations of circles</p>	<p><b>Topic:</b> Further Algebra</p> <p><b>Assessment:</b> Internal Assessment on units 15+16</p> <p><b>Knowledge:</b> Rearranging formulae, Algebraic fractions, Surds, Solving equations with algebraic fractions, Functions, Proof</p> <p><b>Skills:</b> Understanding algebraic manipulation and representation, reversing actions and operations, higher level thinking, mathematical communication and reasoning</p> <p><b>Extension:</b> IGCSE FM level algebraic problems including proof</p>	<p><b>Topic:</b> Vectors, Geometric Proof, Proportion and graphs</p> <p><b>Assessment:</b> FULL MOCKS</p> <p><b>Knowledge:</b> Vectors, geometric problems, direct and inverse proportion, exponential functions, non-linear graphs and transformation of graphs</p> <p><b>Skills:</b> Space and shape awareness, higher level thinking, drawing, moving between algebraic and visual representation.</p> <p><b>Extension:</b> Introduction to matrices (IGCSE)</p>	<p><b>Topic:</b> completion of the course and revision</p> <p><b>Assessment:</b> Internal Assessment – to cover all topics</p> <p><b>Knowledge:</b> Completion of all knowledge in units 1-19. Teachers may reteach some earlier work and classes will also look at past exam papers</p> <p><b>Skills:</b> Revision, use of time, recap and review, self-reflection, use of previous papers, exam skills and techniques</p> <p><b>Extension:</b> IGCSE work if applicable</p>	<p><b>REVISION</b></p> <p><b>Year 11 Exams</b></p>	<p><b>Year 11 Exams:</b></p>
	<p><b>Rationale:</b> Students have now seen a lot of algebra work and can start to apply this to some higher topics they were previously not ready for. This unit links previous topics together and helps students to understand the parallels between graphical and algebraic representations of functions</p>	<p><b>Rationale:</b> This is a challenging unit that requires a lot of previous knowledge and hence it comes towards the end. This higher level thinking is excellent for higher learners. Lower achieving students may use some time to recap the basics in these areas in preparation for the exams.</p>	<p><b>Rationale:</b> Students need to complete their communication in mathematics and ensure they are fluent in their proof and reasoning. These units provide algebraic and geometric outlets for reasoning and communication.</p>	<p><b>Rationale:</b> This term is set aside for revision of all units and for the completion should any classes over run from the schedule. In the slot it is important to support students in their development of revision and exam skills as well as students undertaking the full mock practice. This is the first time they see a full set of papers.</p>		

We follow the Edexcel A level in Mathematics with Terminal Examinations at the end of year 13.

	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
<b>Year 12</b>	<p><b>Topic:</b> Algebra and functions, co-ordinate geometry,</p> <p><b>Assessment:</b> Baseline Test in week 1, First Impressions in Week 5</p> <p><b>Knowledge:</b> algebraic expressions, surds, indices, quadratic functions, equations, inequalities, graphs, transformations, straight line graphs, circles.</p> <p><b>Skills:</b> algebraic manipulation, communication, precision, sketching, modelling</p> <p><b>Extension:</b> cubics and higher powers, graphical inequalities, modelling</p>	<p><b>Topic:</b> Further algebra, trigonometry and 2D vectors</p> <p><b>Assessment:</b> Full Mock to include all covered content (1 paper)</p> <p><b>Knowledge:</b> algebraic division, factor theorem, proof, binomial expansion, trigonometric ratios and graphs, identities and equations, vector properties and definitions, position vectors, distance between points and geometric problems with vectors</p> <p><b>Skills:</b> algebraic manipulation, visual concepts, proof and reasoning, communication in mathematics</p> <p><b>Extension:</b> proof of trigonometric rules (sine, cosine), alternative formulae for BE, 3D vectors</p>	<p><b>Topic:</b> Differentiation, Integration Exponentials and logarithms</p> <p><b>Assessment:</b> Topic tests only</p> <p><b>Knowledge:</b> Differentiation, from first principles, gradients, tangents, normal and extrema, integration, definite and indefinite integration, area under graphs or between lines, exponential functions and logarithm laws.</p> <p><b>Skills:</b> modelling, application of abstract concepts, developing links between multiple methods, application of laws</p> <p><b>Extension:</b> Areas between 2 curves, first principles for more complex functions, volumes of revolution (FM)</p>	<p><b>Topic:</b> Statistics and (introduction to) Mechanics</p> <p><b>Assessment:</b> Full Mock to include all pure content (and some applied) – 1 paper</p> <p><b>Knowledge:</b> Sampling, data presentation and interpretation, measures of location and spread, coding, statistical diagrams, regression, probability, statistical distributions, hypothesis testing, mathematical modelling, Force as a vector, Kinematics for constant acceleration</p> <p><b>Skills:</b> Application of mathematics, real life concepts, modelling, moving between diagrams and written information</p> <p><b>Extension:</b> modelling, different types of probability distribution</p>	<p><b>Topic:</b> Mechanics plus REVISION</p> <p><b>Assessment:</b> Unit tests only</p> <p><b>Knowledge:</b> kinematics formulae, suvat, Newton's first law, force diagrams, equilibrium, Newton's second law, pulleys, variable acceleration using differentiation and integration</p> <p><b>Skills:</b> Application of mathematics, real life concepts, modelling, moving between diagrams and written information</p> <p><b>Extension:</b> inclined planes, proof of SUVAT, pulleys on slopes, discussion of acceleration with <math>i, j</math></p>	<p><b>Topic: YEAR 2 CONTENT:</b> Algebraic and partial fractions, Trigonometry</p> <p><b>Assessment:</b> UCAS exams – 2 papers to cover all year 1 content and used for UCAS predictions</p> <p><b>Knowledge:</b> Algebraic Fractions, Partial Fractions, Radians, Arcs and Sectors, Reciprocal and Inverse Functions, Compound and Double Angle Formulae</p> <p><b>Skills:</b> algebraic manipulation and representation, making links between methods, modelling, proof</p> <p><b>Extension:</b> partial fractions with quadratic numerators, applications of radians</p>
	<p><b>Rationale:</b> it is important that students establish a strong basis in Algebra and that they understand how it reacts to certain operations. This is the fundamental aspect of the whole course and is needed for everything.</p>	<p><b>Rationale:</b> The algebra needs to continue before all basics are covered. After this, vectors provides a lighter break and allows students to start to see things visually. It also is one of the first chances to explore geometric proof in detail.</p>	<p><b>Rationale:</b> Calculus will be new to all students who have only the GCSE. This unit helps them to understand all the processes and applications with simple polynomial functions so that they can later apply this to more complex functions.</p>	<p><b>Rationale:</b> Students can now confidently work with both numbers and algebra and the development of these key skills into an applied context is important. This term allows students to develop their communication and reasoning away from abstract concepts.</p>	<p><b>Rationale:</b> Completing the applied modules, the mechanics can link other aspects of algebraic solving and modelling to real and familiar situations and allows the students to draw some parallels between subjects. This term is also used for revision and exam skills.</p>	<p><b>Rationale:</b> We start promptly on the year 2 content to provide revision time in year 13. These topics start to develop higher thinking and provide a good intro to a few new topics for the new year.</p>

	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
<b>Year 13</b>	<p><b>Topic:</b> Trigonometry cont'd, Functions and modelling, Parametric equations</p> <p><b>Assessment:</b> UCAS and Diagnostic Testing</p> <p><b>Knowledge:</b> Radians, Inverse and Reciprocal Trig, Compound and Double angle formulae, Geometric Proof, Rcos and Rsin, Proving Identities, Proof, Modulus Function, Composite and Inverse functions, Transformations, Modelling, Domain and Range, Sketching graphs, Parametric Equations including sketching and modelling</p> <p><b>Skills:</b> communication and proof, graphical representation, algebraic manipulation, making links</p> <p><b>Extension:</b> Considering how to sketch graphs, inverses and reciprocals beyond the course using key points,</p>	<p><b>Topic:</b> Differentiation, Integration, Binomial Expansion, Sequences</p> <p><b>Assessment:</b> Single RA on Pure content</p> <p><b>Knowledge:</b> parametric differentiation and integration, differentiation of trig functions, exponential functions, second derivatives, product rule, quotient rule, chain rule, connected rates of change, Integration of exponentials, polynomials and trig. Integration by substitution, by parts, by partial fractions, using identities Area under graphs or between 2 curves, trapezium rule. differential equations, binomial expansion – link to partial fractions</p> <p><b>Skills:</b> Understanding of a process, application and selection of a variety of rules, communication and reasoning</p> <p><b>Extension:</b> Complex integration, methods for locating roots, proof</p>	<p><b>Topic:</b> Numerical Methods, Proof, Vectors, Statistics, Mechanics</p> <p><b>Assessment:</b> Pure Mocks – 2 papers</p> <p><b>Knowledge:</b> Location of roots, Solving by iterative methods, Newton-Raphson method, 3D vectors, Proof by deduction, counter – example, contradiction and exhaustion, Correlation coefficients, hypothesis testing, probability, conditional probability, set notation, the Normal distribution, approximations, hypothesis testing. Mechanics may start</p> <p><b>Skills:</b> calculator work (statistics), shape and space awareness (in 3D), application and selection of rules, real life situations, application of mathematics, modelling, communication, proof</p> <p><b>Extension:</b> Complex integration, normal distribution formulae</p>	<p><b>Topic:</b> Mechanics plus REVISION</p> <p><b>Assessment:</b> Paper on Applied</p> <p><b>Knowledge:</b> Moments, Resolving forces, friction forces, coefficient of friction, projectiles, equilibrium, static particles, ladder problems, dynamics, constant acceleration using the i,j system, variable acceleration using the i,j system.</p> <p><b>Skills:</b> mathematical reasoning and communication, proof, algebraic manipulation and representation, modelling, real life situations (and assumptions)</p> <p><b>Extension:</b> combination of topics, proof of dynamics formulae</p>	<p><b>Topic:</b> REVISION</p> <p><b>Assessment:</b> A final mock paper is often offered at the start of this term for extra practice</p> <p><b>Knowledge:</b> Recap and revision only.</p> <p><b>Skills:</b> exam practice, revision skills, exam skills, use of time, focus on key points, exam style</p> <p><b>Extension:</b> All previous topics apply</p>	<p><b>Year 13 Exams:</b></p>
	<p><b>Rationale:</b> these topics link well together and form a basis of many other topics in the year 2 course. It is essential to start off with these in Year 2.</p>	<p><b>Rationale:</b> Calculus is a large part of the course and this unit deepens students understanding of both integration and differentiation now that they have knowledge of more function types.</p>	<p><b>Rationale:</b> Integration links to many parts of the course and students start selecting appropriate methods as an exam skill. Furthermore, this term introduces the first half of the applied module based on last year's previous knowledge of statistics.</p>	<p><b>Rationale:</b> The second half of mechanics builds on year 1 knowledge and has more complex scenarios. This unit also helps them to understand modelling assumptions they also use in the pure and statistics elements.</p>	<p><b>Rationale:</b> Revision of the two year course is key with terminal exams. It is important to support exam skills and ensure students understand the tone of the exam</p>	

